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The Temple of Belus.

FROM the earliest days of the study of archæology, the great Temple of Belus, or Bel Merodach, the chief god of the Babylonian Pantheon, was a wonder of the world. The Greek travellers, historians, and geographers have written upon it, as have most modern travellers and explorers. But now, when the descriptions afforded us by the Babylonian scribes can be consulted, we may hope to gain a truer knowledge of this great national fane of the Babylonians. The temple was called the Temple of "Bit Saggal," or the "House of the exalted Summit," its name being derived from the great stage tower which formed its centre. It was restored by nearly every Babylonian and by a great number of Assyrian kings, and from these records we have been able to gather some interesting details regarding the edifice and the arrangement of its component parts. The principal inscriptions which have been consulted in order to gather the necessary details are, the tablet copied by Mr. Smith, and a notice of which was first published by him in 1876; this gives the measurements of the principal courts and edifices. Other inscriptions are the cylinders of Esarhaddon, Assurbanipal, kings of Assyria; and the India Museum inscription and cylinders of Nebuchadnezzar. From these, together with numerous small inscriptions and tablets, we have been able to gather the account of the main features of the building. The very faithful descriptions of the temple given by Herodotus have also been found of great aid, but those of Strabo and Diodorus must be rejected as fictions.

An inscription, of which unfortunately we possess only a copy made by the late George Smith, the original having been lost, furnishes us with a very large number of details and measurements of the great Babylonian temple. This temple was to Babylon what the great temple at Jerusalem was to that city, and, together with the royal palace, which was close adjacent to it, formed the acropolis of the city.

Herodotus, who visited Babylon when under the Persian rule, in the fifth century before the Christian era, has preserved a very accurate description of the main features of the great temple and the surrounding buildings, and his account meets with very great confirmation from the above inscription. We have in our former article dealing with the land laws and system of land survey in use in Babylonia,* given some account of the system of measures in use. But as the details of this work are expressed in a fuller scale of notation, it may lead to a better understanding of the matter if a short space is devoted to the explanation of the Babylonian numerical system.

A double or compound system of notation was in use among the mathematicians of Babylonia, being a fusion of the decimal and the sexigesimal, or a scale having for its units the numbers 10 and 60. The scale consisted of the following summations,—the unit 1, the sos or 60, the *ner* 60 × 10 = 600, and the sar or sarros = 60^2 = 3,600. With this series the Babylonian managed to carry out most extensive mathematical calculations.

In the measures employed we have the cubit, and the gar, with the uban or Babylonian inch, the table of these being as follows:—

60 uban = 1 cubit.
6 cubits = 1 kan, cane or reed.
12 cubits = 1 gar or double reed.

In the dimensions given in this inscription there occurs one, the ku, which is uncertain in value. We have, as it occurs only once, assumed it to be 20 cubits, but this is only an assumption.

Following the above system of mensuration and notation, the dimension given can be made out with considerable facility. The length of the Babylonian cubit is uncertain. Drs. Oppert and Lepsius, who have devoted considerable study to the ancient systems of mensuration, have arrived at different results, and so, in the following calculations, we have adopted as the length of the cubit, 20 in. English, which is possibly a little short of the real equivalent, but it will give fair approximate results.

Herodotus, who visited and inspected the temple and the edifices connected with it, gives a very full description of the temple accompanied by his own general measurements, and it is very important to notice that in his order of description he follows very closely that of the inscription, and it is therefore very possible that the Chaldæan priest who acted as his dragoman may have been familiar with the inscription which is now so valuable to us. Herodotus states that the temple area was a large square enclosure, two *stades* each way. Assuming the Greek stade to be equivalent to 600 English feet, this would give 1,200 ft. for each face, and about 4,800 ft., or 1,600 yards, as the total circuit, equal to about $\frac{1}{12}$ of an English mile. The inscription commences by giving the measurements of the two great courts of the edifice. The first is called the grand court; the second the "court of the goddesses Istar and Zamama."

The Great Court was 11.33.20 in length; that is, following Babylonian notation, 11 × 3,600 by 33 × 60 + 20 uban = 41,600 uban or 693⅓ cubits = 1,156 English feet. The breadth was 9 × 3,600 = 32,400 uban, or 540 cubits = 900 English feet.

The dimensions of the Second Court were 10.33.20 uban = 38,000 = 633⅓ cubits = 1,056 feet English in length, and its breadth 4·30 uban = 16,200 uban = 270 cubits or 450 English feet.

We thus have as our dimensions of the two great courts of the temple,—

1. Great Court, cub. 693⅓ × 540 = feet 1,156 × 900.
2. Second „ cub. 633⅓ × 270 = feet 1,056 × 450.

We can see from these dimensions the excellent proportion and system of these two great courts. The second was 60 cubits or 100 feet less in length than the large court, and just half its width.

In the relative position of these great courts it is clear that the lesser was not placed within the greater, but was an outer one admitting to it; and in this arrangement we are supported by the testimony of Herodotus as to the external measurements. If the court of Istar and Zamama was the outer one, giving access to the great

* *Builder*, vol. xxxvi. (1878), p. 851.

one, and arranged as indicated in the accompanying plan, the total circumference of the whole block is nearly equivalent to that given by Herodotus. From north to south external measurement we have 1,350 English feet; from east to west, 1,156 English feet. The former is slightly in excess of the two stade, or 1,200 ft., given by Herodotus, as the side of the square; the latter a little under. The above is taking the longest court as the width from east to west, but if the width of the small court, and that at the entrance, which Herodotus was most likely to take, are adopted, we have a width of 1,056, and a total circuit of 4,812 English feet, or only 12 ft. in excess of the circumference of 8 stade, recorded by Herodotus. As there is some doubt as to the exact equivalent of the Greek stade in English feet, this agreement may possibly be even more close. However, it is a strong proof of the accuracy of the general and possibly only round number measurements given by Herodotus.

The inscription next records the gates which gave admittance into the temple. These were six in number, namely,—the "Great Gate."* This was probably the gate leading from the city into the outer court. This was the same gate as that called, in the cylinder inscription of the great builder, Nebuchadnezzar, the "Gate of Fertility, the Seat of Zirat-banit." It is sometimes called the "Gate of Zamama," from the court to which it gave entrance. Close adjacent to this gate, on the outside of the temple precincts, was one of the great marts of Babylon, for in contract tablets mention is often made of bargains being concluded "before the great Gate of Zamama."

The "Gate of the Rising Sun," or the East Gate,† opposite to which was the "Gate of the Canal."‡

There appear to have been three gates admitting from the outer court into the "grand, or inner court." The centre one was the "Grand Gate,"§ while on either side were the "Gates of the Colossi," or winged bulls, and the "Gate of the Tower View."¶ The arrangement of these gates on the plan is, of course, liable to alteration, but we may certainly claim for them that they are as accurate in arrangement as many of the proposed ground-plans of the Jewish temples. On entering the outer court, the first object was the "great sea" or tank, used for the purpose of purification, and corresponding to the "brazen sea" in the Jewish temple, and the fountain for washing in the courts of Mohammedan mosques. This was called the Ki Gal** or *birut*,—the pool, and its measurements were 3 Ku square, or 60 cubits by 60 cubits = 100 ft. square. There were four entrances or gates on each side. There is no indication in the inscription of its position in the court, but it was probably placed so as to be convenient for a worshipper entering by any of the three outer gates, and so may conjecturally be placed near the centre. It was lined with stone, and supplied with water from the Euphrates by an underground conduit, traces of which exist. In the centre of the great inner court rose the ziggurat or stage tower, which gave to this temple its name of the "Temple of the Lofty Head." This great tower, of seven stages, was called the "foundation of heaven and earth." In the cylinder text just published, Nebuchadnezzar claims to have restored this vast pile. Herodotus thus describes the temple tower:—"In the middle of the precinct was a tower of solid masonry, a stade in height and a stade in breadth, upon which was raised a second tower, and on that a third, and so on up to eight."

The dimensions here given for the base of the great stage tower far exceed those of the inscription, and the only supposition for this discrepancy which we can adopt is, that since the time when the text was written, probably in the reign of Nabonidus, B.C. 555, large additions had been made at the base, or a platform introduced, which Herodotus takes as his base for the measurement.††

The base, according to the inscription, was 15 gar or 180 cubits square, with a height of 5½ gar or 66 cubits; that, in English measure, being 300 ft. square by 110 ft. high. It will be seen from this that the lower stage, according to Herodotus, is just double the dimensions as given by the Babylonian surveyor. In order that the measurements of this tower may be the better understood, the dimensions are arranged in order, thus:—

	Cubits.		English Feet.	
	Side.	Height.	Side.	Height.
Base	180	66	300	110
Second	156	36	260	60
Third	120	12	200	20
Fourth	102	12	170	20
Fifth	84	12	140	20
Sixth	66	12	110	20
Seventh	42 by 48	30	70 by 80	50*

From these dimensions it will be seen that the height was 300 ft., exactly equivalent to the side of the base, and therefore in true accord with the square canon of proportion so much used in the buildings in Babylonia. Following the analogy of the other great temple towers in Babylonia and Assyria, we are able to gain a very fair knowledge of the construction of this vast pile. There were temples of this character with tall ziggurati or stage towers in Babylonia at Borsippa (the Birs Nimroud), and Cutha (Tel Ibrahim), and at Ur (Mughier), as well as in Assyria at Assur (Kileh Shergat) and Calah (Nimroud), at Nineveh (Koyunjik), and at Dur Sarguia (Khorsabad). The Greek writers state that the seven stages of the temple towers were each of them coloured according to the divinity to which they were dedicated, and this statement meets with confirmation from the discoveries made in the excavations round the base of the great tower at Khorsabad. There were found there bricks covered with coatings of stucco and painted blue, black, red. The excavations made by Mr. Rassam at Babylon, and especially in the Amran mound, have brought to light a number of bricks covered with coatings of coloured plaster, showing that this mode of decoration was in vogue in Babylon, and we may therefore conclude that the stages were decorated with bricks according to the proper colours of the seven great gods. According to Sir Henry Rawlinson, who has devoted much study to this subject of the construction of the Temple of Belus, the colours were arranged thus, base black, second white, third purple or dark blue; fourth, light blue; fifth, red; sixth, silver; seventh, gold. The inscriptions show that the summit was covered with gold, as we shall see when we come to examine the accounts of the shrine Bel, which crowned the summit of this edifice. Considerable divergence of opinion has existed as to the construction of these great stage towers, and in some of the illustrations which used to adorn, rather than illustrate, pictorial Bibles and works on Biblical archæology, the restorations of the Tower of Belus were strange indeed. These great towers were solely intended for observatories, and were called "houses of observation." They were in all probability solid in the interior, being composed of brick casings filled in with earth, and may roughly be said to resemble seven solid proportionately-decreasing cubes placed one on top of another. In recording his restoration of the great seven-stage tower at Borsippa (Birs Nimroud), Nebuchadnezzar speaks of "the filling up the interior with earth and casing with brick." The great tower at Kileh Sherghat, the ancient Assur, which had fallen into decay, was restored by Rimmoniari in the thirteenth century, and from the foundation record now in the British Museum we gain some details of the construction. The king says, "Its site I enclosed, its strengthening I accomplished, with stones and earth I made." If, therefore, the materials employed were only earth core and sun-dried bricks with an outer casing of kiln-burnt bricks, the decay of the edifice would be rapid and a great mound of *débris* would mark the place. Moreover, nearly all traces of plan would be obliterated.

Stone being almost entirely wanting in Babylonia,—it could only be obtained from a great distance, and at great expense, and, as the inscriptions show, was regarded as precious,—its use was far from general. The building material was exclusively of brick, either kiln-burnt or sun-dried, and the ever-recurring phrase in the royal specifications is "with bitumen and brick I made strong." The use of reeds as binders is mentioned by Herodotus, and proved by the extant remains to have been practised. This is noted by Mr. Rich in his memoir on the ruins. He states that he found "at the Mujelibe layers of reeds on the top of every layer of mud-cemented bricks." And impressions of reeds are often found in the bitumen adhering to the bricks.

There remains one other point to be noticed before passing to consider the great shrine which adorned the summit, namely, the means of ascent. In the inscriptions, the word rendered by some translators "staircase" is from a root meaning "to raise," "to exalt," "to ascend," and meaning rather "ascent," and we should consider, as we find it applied to ascents which must have been used for chariots such as the approach to the great gate of the palace at Nineveh, that the word rather applies to "inclines," gradual ascents, than to stepped stairs. The summit of the tower was probably reached by a series of such inclines, arranged as indicated on the plan.* To return now to the Greek historian, and his account of the great temple:—

"On the topmost tower there is a spacious temple, and inside the temple stands a couch of unusual size, richly adorned, with a golden table by its side." With this account of the temple we may compare the following extracts from inscriptions which record the beautification of the shrine. Assurbanipal, who had done so much to decorate Nineveh towards the end of his reign (B.C. 668-625), restored the shrines of Babylon, and especially that of Merodach, at Babylon.

"Bit-Saggal, the temple of the lord of the gods, Merodach, I made, I completed its † decorations. Bel and Bilit, the divinities of Babylon, and Hea (Oanes), the divine judge, from the midst of temple I brought.‡ I caused them to enter into Suanna.§ His holy place, fifty talents of gold . . . . with bricks I finished and enlarged. I caused to be made a ceiling ‖ of cedar-wood, beautiful as the stars in heaven, adorned with beaten gold. Over Merodach rejoiced my heart. I worshipped and performed his will.

A noble chariot,¶ the carriage of Merodach, prince of the gods, with gold, silver, and precious stones, I finished its work. To Merodach, lord of the gods, king of the host of heaven and earth, the sweeper away of my enemies, I gave *a couch;* ** of durable sycamore wood for the holy place, covered with precious stones, gold and silver, as the resting-place of Bel and Beltis, givers of favour, makers of friendship, skilfully I made."

Here we have a distinct mention of the couch as an important item in the furniture of the shrine some two centuries before.

According to another inscription, this couch was 9 cubits long and 4 cubits broad, or 15 ft. by 6 ft. 8 in.,—a size which fully justifies the expression of Herodotus, that the couch was of unusual size.

From the inscription now in the India Museum at South Kensington, which is full of details of the great works of building and restoration carried out by Nebuchadnezzar to the shrines, temples, palaces, and public works of Babylon, we may quote the following account of the restoration of this shrine in the early part of the sixth century, B.C.:—

"The shrine of the oracle of Bel of the gods, Merodach. Its gold-plated summit, like the daylight, shone; with marble and alabaster the interior I covered.

His holy shrine,†† the royal shrine, the shrine of his lordship the inspector of the gods, the Prince Merodach,

Which a former prince with silver had worked its work. With bright gold of surpassing splendour I caused it to be plated,

To the summit, the crowning point, with great beams, which from the mountains of Labnana,‡‡ lordly wood which they had brought,

For the ceiling of the shrine of the oracle of his lordship.

Even to the floor, the walls, the great beams, to the ceiling of the shrine, with bright gold I covered.

On the face of the beams and the ceiling with gold and precious stones I adorned."

On reading such a description of royal and lavish decoration of the shrine of the lord his god, the similar passages in the Hebrew books of Kings and Chronicles descriptive of the

* Marked A on plan. † C on plan. ‡ B on plan. § D on plan. ‖ E on plan. ¶ F on plan. ** G on plan.

†† This platform is indicated on plan as a square of 600 ft., or one stade.

* See plan and elevation.

† The work was commenced by Esarhaddon.

‡ They had been removed during restorations.

§ The holy quarter of Babylon.

‖ "Overshadower."

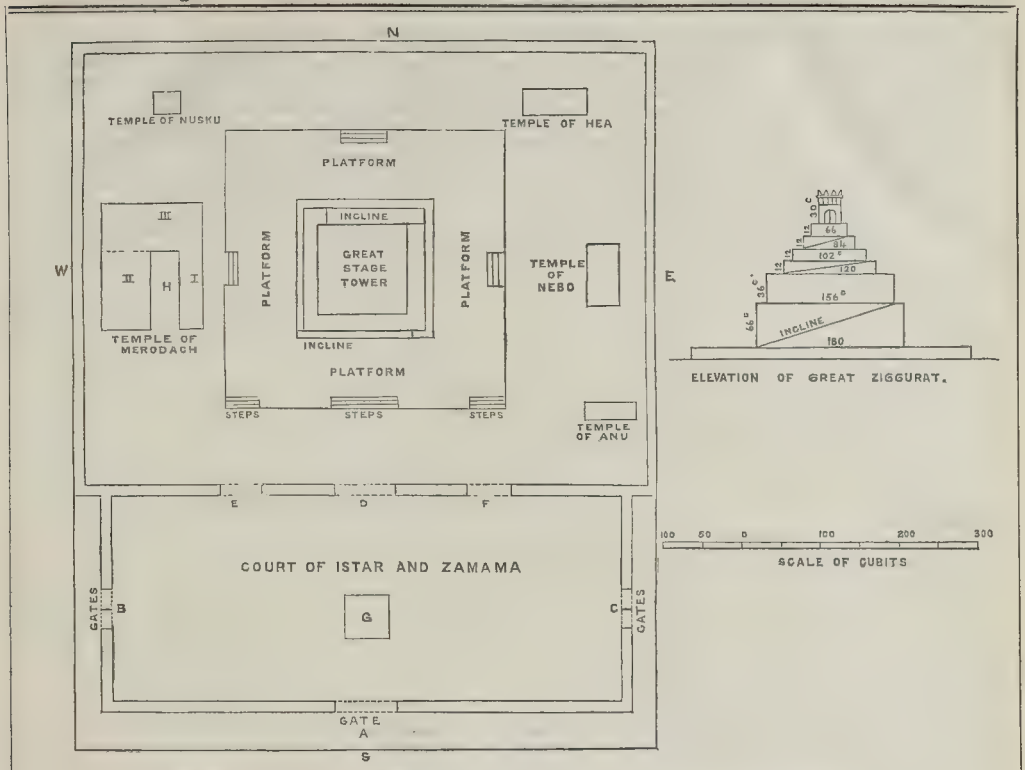
¶ Often represented on the seals and engraved gems.

** Wood of reclining. Also rendered in some inscriptions "bed."

†† The word here is "parrakku," which is very closely akin to the Hebrew *paroketh*, "the veil of the temple." The word is also used as a synonym of *kurun*, "the sacred impenetralia."

‡‡ Lebanon.

* Shrine of Merodach.



TEMPLE OF BELUS AT BABYLON.—*Plan Restored from data furnished by the inscriptions.*

building of the great temple of Jerusalem are at once called to mind. "The shrine of the oracle," so lavishly decorated by Nebuchadnezzar, corresponded in the Babylonian temple exactly to the oracle (*debor*) in the Temple of Solomon, which was a cube of 20 cubits, and was overlaid with pure gold, as were all the fittings and the posts of the screen and the altar, &c. (1 Kings vi. 20, 30). There is no mention in any of the inscriptions of any statue of Merodach in this shrine, but in the temple, at the west side of the inner court, there was a seated figure of the great Babylonian deity. Herodotus states "that below, in the same precinct, there is a second temple in which is a sitting figure of Jupiter all of gold. Before the figure stands a large golden table, and the throne whereon it sits, and the base on which the throne is placed, are likewise of gold."

The temple thus described by the Greek historian is evidently to be identified with the large group of sacred edifices in the inner court on the west side. These consisted of three blocks forming three sides of a square. The dimensions of these buildings were,—

Wing I. 100 cubits by 20 cubits = 166 ft. by 34 ft.
Wing II. 100 cubits by 65 cubits = 166 ft. by 108 ft.

The main block joining the two wings was 125 cubits by 30 cubit = 208 ft. by 50 ft.*

These temple buildings are evidently to be identified with those described, in the India Museum Inscription (col. iv., line 7) as being restored by Nebuchadnezzar. "The temple of sacrificial victims, the high place of Bel of the gods, Merodach, the inspector of seasons and chief of the angels and spirits. In the holy places of Babylon with bitumen and bricks I made." A much fuller description is to be found in an inscription belonging to the early Babylonian empire, which was copied and possibly re-edited by Assurbanipal's orders. From this inscription† it appears that the temple was richly adorned with gold and silver, and that in it were statues, seated figures of Merodach and Ziratbanit, his consort. It is curious that Herodotus notes especially that the figure was seated, as this mode of representing deities was usually adopted by the Babylonians, as shown on the seals and gems. There is a curious passage in this inscription which may be quoted here:—

"For the shrines of Merodach and Ziratbanit a rich dress, a princely dress, dress of dark blue and gold spar I clothed them. With sets of robes their great divinities I had adorned; lofty-horned crowns, crowns of dominion, emblems of divinity, which were perfection, perfect I gave."

From this it is evident that the stone figures were clothed, and thus the rude stiffness which is so marked a feature in the statues which have been recovered, such as the Nebo figures in the Museum and the seated figures, would be hidden. This also calls to mind the passage in the "Iliad" of Homer, where the clothing of a statue is mentioned.*

It is evident that this block on the west side of the great quadrangle was the "sacrificial temple" of Merodach and his consort, and here were the images of the gods. It is this temple which the writer of that strange appendix to the Book of Daniel, the story of Bel and the Dragon, refers to.

There were several other temples within the great enclosure.

On the east side of the court was a temple dedicated to Nebo and Tasmit his wife. The dimensions of this temple were 80 cubits by 40 cubits = 133 ft. by 67 ft.

In the India Museum inscription we have the following description of the temple,—"The Temple of Nebo, the supreme intelligence of the gods. He who is the giver of the sceptre of justice for the ruling of all men. 'The Temple of the sceptre.' His temple in Babylon with bitumen and bricks I built, and worked its work."

This temple is to be distinguished from the great Temple of Nebo at Borsippa, which was a rival of the great Temple of Belus. The temples on the north side were two, one dedicated to Hea or Neptune, "the Oanes" or "teacher of wisdom." This temple was 85 cubits by 30 cubits = 142 ft. by 50 ft.; and adjacent to it was a temple dedicated to Nusku, "the messenger god," the Mercurius of the Babylonians. This temple was in dimensions 35 cubits square, or 85 ft. by 85 ft. Neither of these temples appears to have been repaired by Nebuchadnezzar. The Temple of Nusku was, however, restored by Assurbanipal, king of Assyria, who thus describes it:—"The dwelling of Sin and Nusku, which a former king, my predecesser, had built; from the beginning had been left, that dwelling had become old. The dwelling of Sin and Nusku its damages I repaired, beyond what was before I enlarged its site. From its foundation to its roof I restored it and finished it."

The doors were covered with silver and precious stones, and eagle-headed figures, the emblems of Nusku, guarded the doors. On the south side was the temple dedicated to Anu and Bel, and not Bel Merodach the Babylonian Belus or Jupiter, but the lesser Bel. The dimensions of this temple were 70 cubits by 30 cubits, or 117 ft. by 50 ft. There is no mention of this shrine in the inscriptions of the great builder-king Nebuchadnezzar, but in the copy of an early Babylonian text above referred to the restoration of the edifice is briefly recorded.

The Temple of Belus, the principal features of which are above described, may be said to be the heart of Babylonia. When all was well with the empire it was rich and prosperous; and pious and successful kings lavished treasure on its shrines. When the invader, the conspirator, and the rebel disturbed the land, then did sacrilegious hands seize on its gold and silver to bribe the aid of some potentate. But this temple is not only a pivot round which cycles of Babylonian history revolve, it is a land-mark in the history of Western Asia. The temple-tower or ziggurat of Belus raised its head above the surrounding plain when Abram set forth on his journey to distant Canaan. So, centuries

* See plan H.

† WAI. v. pl. 33.

* "Iliad," vi., 297-303.

after, it looked down on the captives which Nebuchadnezzar the conqueror carried away from the city of the Jews; it saw the birth of the Jewish nation, and was witness of its death. Built centuries before the temple of Solomon, its treasure-house was the receptacle for the vessels carried to Babylon as spoil.

With these facts before us, it is very possible that its construction in some degree afforded the Jews, a none too inventive people, a basis for the second temple. There are many points of agreement. The Holy of Holies and the shrine of Merodach exhibit very similar construction. The Great sea finds its equivalent in the *Birut* or tank,* while the court of the goddesses Istar and Zamama corresponds to the Court of the Women. It was in this outer court of the temple that the ceremonies described by Herodotus and the Hebrew writer, Baruch, connected with the worship of the Asiatic mother-goddess, took place.

It is hardly to be wondered at, when we consider how greatly Babylonia had influenced all Western Asia in religion and mythology, that it did with that influence also exert some influence on the religious architecture.

It is now time to pass to the consideration of the question which of the great mounds marking the sites of the ruins of the great edifices of Babylon covers the ruins of the Temple of Belus.

In dealing with this point, there are certain facts which must be borne in mind, and these are of considerable importance. First, that Rich, Rennel, and others who have written learned treatises on the ruins of Babylon, could not read the inscriptions, and were, therefore, only guided by the very second-hand information of Greek writers. Then, also, there must be remembered that for centuries Babylon has been the brickfield of the builders of the districts of Hillah and Baghdad. The houses, the court-yards, the fortifications of Hillah, and a great part of the works of Baghdad, are built with bricks which bear the name and titles of Nebuchadnezzar. When we consider this, we must see that many of the ruins have been greatly reduced by this constant carting away of bricks, and so do not represent so great an altitude as formerly, while *débris* is largely spread over the surface. It will be admitted that where a brick is found bearing an inscription referring to a definite edifice, the probabilities are that the spot where it is found is the site of that edifice. So we see that a slab found in one of the mounds of Babylon which bears an inscription reading the "palace of Nebuchadnezzar" should mark the site of the palace; while another bearing the "legend of the Temple of Bit Saggal" should mark the site of that temple.

Most writers have regarded the Babel mound situated at the northern extremity of the *enceinte* of Babylon as the site of the Temple of Belus. But the explorations carried out on the site by Mr. Rassam in 1878, which led to the discovery of a number of wells and extensive hydraulic apparatus of conduits, &c., would seem most strongly to show that this was the site of the new palace, and the precincts of which were the celebrated hanging gardens.

Passing south a mile, we come to the next great block of ruins, the Kasr or palace mound. Arab tradition marks this as the palace of the Babylonian kings,—the old palace,—and this meets with confirmation by a brick inscription which records the legend, "the palace of Nebuchadnezzar, king of Babylon." It is therefore most probable that this is the site of the palace of Nebuchadnezzar. This inscription reads,—

"The palace of Nebuchadnezzar, king of Babylon, restorer of Bit Saggal (Temple of Belus), Bit Zida (Temple of Nebo). In the service of Nebo and Merodach, his lords, he has gone forth. Son of Nabupalassar, king of Babylon."

This inscription differs somewhat from the usual stereotyped phrases of the brick legends, and clearly belongs to the palace; its being found in the Kasr mound would therefore seem to mark that spot as the ruins of the palace.

At the southern extremity of the *enceinte* of Babylon is a large mound usually called the Amran mound. It derives its name from an imaginary son of Ali, named Amran, whose pretended tomb is here. It is somewhat unfortunate for Moslem martyrology that Ali is proved to have had no such son. It is very possible that the Arabic Amran is an echo of the old name of Namir, "the bright place," which was given to the temple, the great tower being called Namir Bel. This mound, according to the measurements of Mr. Rich, was 1,100 yards long and from 800 to 900 yards broad. This ruin is considerably larger than the dimensions of the temple in the description we have examined, but the amount of *débris* from the stage tower and the walls may very greatly have increased its area. From this mound comes a brick bearing the following inscription:—

"To Merodach his lord, Assur-akhar-iddina (Esarhaddon), king of the land of Assyria, king of Babylon, with bricks the temple of Bit Saggal (Belus), and the 'Temple of the Foundation of Heaven' (the stage tower), anew he has caused to be made."

The excavations on this site have brought to light great numbers of bricks, and fragments of coloured and stucco-coated bricks, as well as plaster capitals and cornices inlaid with glazed tiles. It is, therefore, most probable that we shall find that beneath the *débris* of the Amran mound are the ruins of the Temple of Belus.

Mr. Rassam's explorations on the site of Babylon have shown that the ruins of the establishment of Egibi & Sons, the great bankers, tax collectors, and land agents of Babylon, whose inscribed documents afforded us so much information* regarding the topography of Babylon, was situated in a spot now marked by the Jumjuma mound, a little south of the Amran. In these contracts we have frequent mention of bargains concluded near to the gate of Zamama, and we may therefore suppose that this gate was close adjacent to the business establishment of these great traders. In conclusion, we can only say that the question of the topography of ancient Babylon is one that presents great difficulties, as the ruins have been for years the brickfield of the district, and this irregular excavation has, no doubt, destroyed numerous traces of the plan of the city, which would have been invaluable to the student of archæology. The long and extensive series of explorations which Mr. Rassam has been able to carry out on the site of Babylon, and the results of which will be made known to us on his return to England, will, no doubt, contribute much to the solution of the many problems connected with great Babylon.

* Perhaps the Birket-Israel would be more appropriate.

AN ENGINEERING AID-BOOK.†

THIS is the second part of a useful book. On the publication of the first volume we said (*Builder*, 27th of April, 1878) that its study might save much time, much money, and consequent heartache. In the present volume we find the results of much experience, and of much of that yet rarer qualification, common sense, made available to the inquirer in a systematic form. Taking, for example, Chapter xiv. (which is the first in the present volume), "On Contract and Purchase in the Building Trades," we should characterise it as a skeleton form of thought applicable to the subject,—a sort of mental algebra, by the use of which, substituting the true values for the algebraical values, the student can hardly fail to obtain a true answer.

There is, however, one part of this chapter which would fairly bear to be treated at much more considerable length. We refer to the subject (p. 30) of "Payment by Results accomplished." The author justly says that to the spirit and enterprise of contractors, who have taken upon themselves the risk of failure, the carrying out of many important works which would not otherwise have been attempted is due. We confess a leaning to the opinion that for large and important works the best method of arrangement is that of a lump contract for a definite sum, to be only increased or diminished by an increase or diminution of the work ordered by the engineer. It was upon this principle that the earliest contracts for railways were based, and we think that upon the whole, it has been found to work better for both parties, the company and the contractor, than any other method. In cases of contracts under foreign Governments abroad, we think that this mode, carefully advised upon, not only by an English lawyer but by a local lawyer, affords almost the only security for a contractor. In the earliest English contracts,—those, for instance, made to carry out the specifications of Mr. Robert Stephenson for the London and Birmingham Railway, there were three schedules attached,—one for additional work, one for deductions, and one for valuation of monthly measurements. This method has been abandoned as complicated. We hold to the opinion that it is the most fair, and therefore the most economical. We can call to mind an instance in which, owing to some arrangement with an independent railway company, the levels of a line were so altered that a large embankment, preparations to carry out which in the specified time had involved the contractor in the purchase of a large plant, was abandoned. To settle this deduction simply by deducting the scheduled price for that quantity of earthwork as *not done* would have been grossly unjust to the contractor. Slight additions or deductions may be made, if they balance each other, at an average price. But to set to work with a single schedule of prices, the quantities being taken only approximately, can only fairly be done in cases where the experience of the quality and cost of the work is ample, and where the contractor can be quite at ease as to his calculations of more or less. We are strongly of opinion that contracts for great works should be so arranged, in the first instance, as to avoid the labour, delay, and usual squabble attendant on "measuring up" at the end, in order to make out the contract bill. Nor do we see how this end is to be attained, except by the method of a lump contract, alterable only on ordered and executed deviations from the contract quantities,—the value of the additions or deductions corresponding to which should be directly ascertainable by fair schedules of prices attached to the contract itself. Whenever a contractor departs from this method of protecting himself, he must do so either by appreciably increasing the price of every item in his schedule, or by running a risk of disaster, which would probably cost the company far more than they could hope to recover.

There is a novelty in the typography of Mr. Matheson's book which we hope to see extensively followed. We hardly know whether the author will at once take it as a compliment when we say that he presents us with a reversal to the most ancient form of writing, the hieroglyphic; but so it is. Mr. Matheson has revived, after a disuse of more thousands of years there it is needful now to count, an expedient which puzzled the early students of hieroglyphics, until it was understood. In the Egyptian writing of the last 5,000 or 6,000 years it may have been a surplusage, but even there it has at times proved of singular value. We refer to the use of the ideographs or determinants. Thus, if we find the letters (hieroglyphic symbols) "d . o . g." in this kind of writing, they may be followed by a little sketch of a dog. We will not now enter on the question how far each written symbol of sound was originally ideographic, but will come at once to the use made by Mr. Matheson (no doubt with perfect unconsciousness) of this ancient method of explanation. One of the best points of the book, as far as the work of the printer is concerned, is the clear and good system of marginal indications of subject, which forms the basis of a good index at the end of the volume. The novelty in this is the introduction, also in the margin, of a little sketch of the subject of the section. Thus on p. 258, under the marginal head "Water Cranes," we find the sketch of a water-crane, and that of a water-tank with attached hose. The particular instance on which we have lighted is, however, defective in one respect. Neither "Tanks required," nor "Swinging Jib," which are in the margin, are to be found in the index. Nor is there any list of cuts, nor indication to the reader as to the page at which 133 and 134 are to be found. These additions are required in order to make the plan complete. But even as it is, the great aid afforded to any one who is turning over the pages of the book in search of any particular subject by these little marginal ideographs is very great. The cuts are generally good. They might, perhaps, be multiplied with advantage, and in the event of a new edition (which can only be a question of time), we suggest to Mr. Matheson the propriety of introducing a special index of these marginal illustrations, which need only contain the cuts themselves referred to the pages on which they are to be found. This would save the time of turning over the leaves, and may be developed into an aid to the reader, or more properly to the consulter, of volumes of this nature, of a value hard to exaggerate.

* See *Builder*, vol. xxxvi. (1878), p. 832.

† Aid-book to Engineering Enterprise Abroad. By Ewing Matheson, M. Inst. C.E. London: Spon. 1881.

The chapter (xvii.) on "Transmission of Power," is one that has been written with much care and judgment. It brings down the "burning question" of the electric transmission of power fully to the date of publication, although the recent experience of the transmission of a charged Faure battery opens a new chapter in this vital part of mechanical science. The examples given (p. 100) of the transmission of power for as much as four miles in Sweden, by the use of wooden connecting-rods, and that of the transmission, by ropes, of 700 horse-power obtained from three turbines, at Zurich, especially command attention. This chapter presents a remarkable parallel (although, of course, involving much more detail) to the paper by Mr. Conder on the same subject in the new American periodical, "The Progress of Science," which has just been commenced at Boston, U.S. There is, however, one point in the latter paper which Mr. Matheson will do well to extract from that journal in his next edition. We refer to the proportion between the horse-power expended in the working of machinery, and in the net effect produced by that machinery. This is illustrated in a very exact manner by the accounts of the working of the wire rope on the Blackwall Railway, under the direction of Mr. Robert Stephenson.

It is remarkable that in a chapter so comprehensive as to include the subject of the transport of force, under the head "Transmission of Power," which is, perhaps, rather touching on another province, the author should have taken no notice of that method of transmitting power which is by far the most important of all. We refer, of course, to the locomotive engine. It is true that in the chapter on "Railway Equipment," as well as in a chapter on "Railways" in vol. i., the reader will have no difficulty in obtaining information as to the railway locomotive. But what should have been found with regard to it in chapter 17 is the investigation of how much mo ive power is consumed in working the locomotive, as compared to that consumed in the traction of the train. Had we space here to discuss the question, we should be able to show that a loss of something like 80 per cent. of the effect of the steam produced is incurred by its application through the medium of the locomotive propeller. This is a subject which ought to be freely discussed in dealing with the transmission of power.

The chapter on "Railway Equipment" is another instance of what we may call tabulated good sense; and is one of those which is best illustrated by the marginal cuts of which we have before spoken. Those of different forms of rails (pp. 239–241) are especially noteworthy as examples of how effective the graphic table of contents may be made. The sketch of the Barlow Rail calls attention to Mr. Matheson's comment, which hardly does justice to that ingenious invention. The chief objection to it hitherto has been the fact that it is only when the price of iron is abnormally low that it can compete, economically, with other modes of laying. It is also harder to run on than a sleeper line, probably requiring less engine power, but costing more in vehicle and locomotive repairs. At the present time a question would arise as to the feasibility of rolling an iron Barlow Rail with a steel top. If this can be satisfactorily effected, the value of the method for such cases as the Euphrates Valley line is of the first order. A railway can be more rapidly laid, we can say from a good deal of experience, of Barlow rails than of any other construction. When laid it presents a pair of solid continuous metallic bars, which are safer against any hostile meddling than any other form of rail. And, in addition to this, the rail will provide a perfect safeguard for the cable of the electric telegraph, if the isolation is thoroughly effected. Thus, for any case like the Candahar railway, or the great line which we yet hope to see laid on the right bank of the Euphrates, the advantages offered by the Barlow rail would be so great as to justify the engineer in making use of that system, even if somewhat more costly in the first instance than one involving wooden sleepers, subject as they are to attacks from insects, from decay, and from mischievous attempts at displacement. Any savage could pull to pieces a railway keyed into chairs that are bolted to sleepers. Very few would know how to commence operations against a riveted permanent way of Barlow rails.

If Mr. Matheson had not given us a good book, we should not have taken so much trouble to point out one or two improvements that may be made in the second edition. We can conscientiously recommend the volume to our readers.

ST. MARY OVERIE, SOUTHWARK.

ALL possible credit is due, on the part of those who are interested in the history of architectural monuments, to Mr. F. T. Dollman for the labours which he has bestowed in illustrating and commemorating the history of the most interesting and important church in London, next to the Abbey and the metropolitan cathedral. The folio volume* which he has published, in illustration of St. Mary Overie, may be said to have been a labour of love, and of very devoted love; for he tells us that he has been for fourteen years occupied in collecting the materials and making the drawings for it; and a publication of this kind of book is, commercially, a way of spending rather than a way of making money.

The book consists of a history of the church, including a good many curious details not bearing directly on its architectural history, but illustrating the manners and habits of various periods from documents connected with the church, as well as the varying attitude of mind towards architecture of the official bodies who ruled the church in post-Reformation times. The larger bulk of the volume is occupied by forty-four plates, photo-lithographed from the author's drawings, giving measured details of the portion of the ancient church still existing, the choir and retro-choir, and restored drawings of the original nave, which was pulled down in 1838, and replaced by the present gingerbread interior. As regards the manner of the drawings, they have been very carefully executed, and show a great amount of work. We have only two slight criticisms to make, which we do rather for the attention of those who may be moved to produce similar books of illustration. The one is, that some of the drawings are really rather spoiled by the shading and touching, which is somewhat too scratchy for our liking; for instance, the graining all over the woodwork in the elevation of the classical reredos (plate 31) is too coarse and scratchy-looking to improve the effect of the drawing, and, at the same time, it has consumed more mechanical labour than it was worth; and in some of the other drawings there is a good deal of surface-touching, on the masonry, &c., which would have been better omitted; it is not done with sufficient artistic feeling. High finish in surface touching and shading is no doubt an addition to architectural drawings, if it is done very finely and delicately; otherwise it is better omitted. In other respects the drawings are all that can be wished. The other small point we may mention is that the writing on some of the drawings might have been better and more neatly and legibly done. It is the fashion of draughtsmen nowadays to scribble the necessary notes and explanations on their drawings in a rather rough-and ready manner; this may pass in drawings which are only intended as passing illu-trations in a journal (though we beg to intimate that we do not desire to have such scribbly drawings offered to ourselves), but in a book which is intended as a permanent and important contribution to architectural illustration, such as would find place in architectural libraries (as this one certainly should), we do like to see neatness and finish in all the details.

This is, however, only a minor point, and does not impair the essential value of the publication. The interest of the book, in an illustrative point of view, is increased by the fact that the author has had the advantage of making use of some of the drawings of portions of the old church, which no longer existe, made by the late Mr. Gwilt, at the time when he was engaged in repairing the choir. We thus have some authentic records of portions of the building which have now disappeared. The choir of St. Mary Overie still remains essentially as it was (internally, at least), a fine specimen of Early English work of very solid and dignified type; and with a vault which is a remarkably fine specimen of quadripartite vaulting, and affords a marked example also of that peculiar twist of the diagonal rib and its continuous vaulting surfaces, from the unequal transverse and longitudinal width of the bays, which Sir G. Scott called (not inappropriately) "ploughshare" vaulting. The nave of the church has gone through three epochs. Built in the same style and at the same date as the choir, the vault fell in in 1400, a result which has been supposed to have been partly due to the removal or weakening of the buttresses. It was reconstructed with a wooden vault of considerable elaboration of design. In 1831 this roof was removed, it also having become, or supposed to have become, dangerous from decay and dilapidation, and the service of the church temporarily transferred to the choir while the vestrymen and ratepayers quarrelled with each other as to what should be done with the nave, which, in the mean time, was left standing unroofed. Party-spirit ran very high at this time in the parish of St. Mary, of which Mr. Dollman gives some amusing examples in the republication of some of the circulars and p sters issued by those who considered themselves concerned in favour of this or that scheme. The tone of these precious documents may be said to represent the most typical form of a vestryman's mind, and shows a marvellous degree of vulgarity and ignorance, and the reduction of every consideration in reference to the treatment of the fine old church to the most pure and unadulterated test of £. s. d. Eventually the nave was removed and the present specimen substituted, which, such was the incapacity of people at that time even to see correctly the architectural facts that were before their eyes, was believed to be in the most exact conformity with the style of the remaining portions of the original structure. That the choir was not removed and rebuilt in the same fashion was owing, not to any regard for the structure, but simply to the opinion of a majority of the ratepayers and vestry that it would be an unnecessary expenditure of money, against which the most vigorous protests were raised.

The style of the existing portions of the church is well known to all in London who take an interest in Mediæval architecture. Of the original nave, including its vault, Mr. Dollman gives a restored perspective view, and also a section and details of the later oak vaulting which superseded it. We have not been able, however, to find any precise statement as to the authority for these representations. The author states in his preface that he has shown nothing but what he has *bonâ fide* evidence for in the shape of sketches, drawings, or memoranda, nothing of mere conjecture or fancy of his own having been introduced; and he also states that through his introduction to the family of the late Mr. Gwilt, he was enabled to make use, as we have already mentioned, of a number of the drawings made by Gwilt at the time when he was architect for the repair of the choir. In one case, in the elevation of a Norman door which existed in the old nave, he appends a note that this drawing was made from an accurately measured sketch from the original doorway by C. E. Gwilt. We presume, therefore, that the details of the oak vault and of the general architectural design of the nave is also from sketches of Gwilt's, but we have not been able to find any statement as to the source from which this portion of the illustration is derived: it would have been better if this had been more explicitly stated. The drawings of the original stone vault which fell in 1400 must, after all, we presume, be entirely conjectural.

Among the most interesting sheets in the illustrations are some of the various small details, both of parts of the building and of various objects of furniture which had belonged to it. These are collected apparently from many sources, from drawings in different collections or publications, as well as from objects which still exist. Among the latter may be included a considerable number of the carved bosses of the oak roof of the nave, which are still preserved in the building. There are also some interesting sketches of bits of building contiguous to the church, now demolished; some of them very interesting examples of old, picturesque, unsanitary London. On one plate (10) we notice a couple of small sections showing the levels of the roadway and approaches of old London Bridge and the present bridge respectively, in relation to the church, showing how much the church has been put in a hole, on one side at least, by the raising of the level, in accordance with the usual tendency in towns, where the ground-level almost invariably rises as time goes on. With the slight drawbacks of execution which we have alluded to, Mr. Dollman has produced a most interesting and valuable

* The Priory of St. Mary Overie, Southwark, comprising (1) the history, (2) the description, (3) the illustrations, of the church and conventual buildings. By Francis T. Dollman, architect. London: W. Drewett, Southwark, and Dryden Press, Long Acre; and of the Author. 1881.

monograph of a very important building, and done thereby a great service to architects and archæologists.

THE LIVERPOOL LANDING-STAGE.

OUR readers may remember some time since the announcement of the unfortunate destruction by fire of the then new landing-stage in connexion with the pier on the Liverpool side of the Mersey. This large and fine floating pier was before long reconstructed, but the elements seem to be against it, and it is now under the influence of a new and serious danger from the alteration of the bed of the river. The landing-stage is moored parallel to the dock walls at a sufficient distance to float in water which shall be always deep enough for steamers to come alongside at all states of the tide; the want of depth at the old stone pier, the base of which is, in fact, dry at the lowest tides, having been the original *raison d'être* for the landing-stage. The latter, reached by bridges from the pier, thus forms the medium of communication for all the steamer traffic with the town, the regular service of ferry steamers to different parts of the Cheshire side occupying the south end of the stage, while luggage-boats and some of the smaller class of sea-going steamers make use of the rest of the length. About a quarter of a mile south of the end of the landing-stage there has long been, adjoining the Liverpool shore of the river, a shallow known as "Pluckington Bank," nearly dry at low tides, and which, though varying very much in its outline and conformation, has for some years remained pretty much in the same position. But during the last few months Pluckington Bank, for reasons which no one has discovered so far, has enviously and insidiously commenced moving northwards down the river towards the landing-stage, under about one-third of which there is now a formidable sand-bank, which seems to be slowly moving along. Any one now going down on to the landing-stage at low water may see a very curious sight. Looking southwards along the stage, he will see its whole floor twisted, the further end rising considerably, and the side next the dock walls also rising, the floor of the stage thus undergoing a kind of double twist. Part of the stage is aground, in fact, and the rest floating. The stage is carried on floating iron pontoons at right angles to its length, so that one end of a number of these is aground at low tide. What sort of effect this will have upon the plates and rivets of the pontoons may be easily imagined, and we should have expected to hear that some of them were hopelessly leaky before now. A great amount of inconvenience to traffic is also being caused from the insufficiency of water for the ferry steamers at low tide, so that at certain states of the tide they have all to leave their usual quarters and bring up at the other end of the stage, which is so long that the change of position may mean the missing of a boat by passengers who come down to the wrong end. This, however, is a minor matter compared with the serious damage to property which seems to be threatened, and the difficulty of applying any practical remedy.

The method which Mr. Lyster, the Liverpool Dock Board engineer, has recommended, and preparation for which is being made, is to construct sluices along the pier wall, and pour a large body of water from them over the bank, so as to create an artificial scour, and wash the sand away. We confess to being somewhat sceptical as to the efficacy of this expedient. What was very evident to us was that a great deal of money is being sunk in masonry in the construction of the sluices, and that more will have to be sunk before this method, if it does answer, can be effectual, as the bank has already extended considerably further since the construction of the sluices was commenced, and it will evidently be necessary to follow its course further; and we are disposed to think that the mass of sand which has been formed between the landing-stage and the pier is rather too formidable an obstacle to be dispersed by running water over it, at least by any such mass of water as can well be artificially sent over it. It is at present the will of the Mersey, with its strong tidal ebb and flow, to pile up sand here, and it seems very questionable whether the power of the river can be fought with by an artificial sluice. Moreover, the dock engineer does not talk of having his sluice ready for operation till October, and if a good autumn gale comes on before then, it may make short work with the north end of the stage, for the Mersey at Liverpool is really more an estuary than a river, and a gale from some quarters gets up so much of a swell that the stage would soon thump herself to pieces on the bank under such circumstances.

The municipal council, judging from the reports in the local papers, seem to take the matter rather easily, and to have faith in the result of their engineer's operations, with the exception of an irrepressible member who has repeatedly and strongly urged that the corporation should obtain the opinion of one or two leading harbour engineers as to the causes of the shifting of the bank, and as to what the Mersey is doing. We know nothing of the member in question but his name, which is of no consequence here; but, judging from the obvious facts, we are disposed to back him. We fear the matter is likely to prove a more serious one than the corporation authorities are aware of, and may throw great difficulties in the way of the steamboat traffic of the Mersey, besides the loss or damage of property. It is clearly a case for investigation by the most experienced authorities in harbour engineering. They might be able to determine the causes of the shifting of the bank. We were not able to come to any conclusion on the point, except the negative one that we do not believe it has, as some people seem to suppose, anything to do with the effect of the landing-stage itself upon the action of the river. This would, under ordinary circumstances, be all the other way. The old smaller landing-stage, which was moored in the same position, so far from showing any tendency to lead to the accumulation of sand, had scooped a depression in the bed of the river under it from the scour of the water beneath it, which is just what might be expected from the effect of a strong ebb (and the ebb in the Mersey is very strong) running under such a floating obstacle. The causes of the present difficulty in the Mersey must be looked for, we surmise, from changes in the river itself. If the engineer's sluicing operations are carried out, however, we shall be considerably interested to see the result.

GROWTH AND ASPECT OF DUBLIN.

BLACK SPOTS.

As on some former occasions, we have made a circuit of a large portion of Dublin and its environs with a view of seeing what changes for the better are taking place. Notwithstanding some building improvement, in a sanitary direction, most of the defects we previously pointed out remain unrectified. The old quarters of the city, on the south side of the Liffey, and the old and more modern quarters on the north side, are unimproved and hastening to that description of rapid decay which bespeaks danger to the public safety, and a large measure of demolitions at no distant date. It requires a knowledge of the eighteenth-century growth and position of Dublin to estimate aright the changes that have taken place in the aspects of the city in the present century, and the influences that have been at work in producing the marked social changes. We cannot, however, here enter at length into such a discussion, for it has its political as well as industrial and social bearings. It is a singular and suggestive matter that the finest streets of houses of the northern portion of the city, and that, too, the most modern part of the town, should so rapidly go down, and be deserted by the well-to-do gentry who once resided in them. Since the commencement of the present century a large number of streets on the south side of the Liffey,—once busy, industrial centres,—have been decaying, but not until a quarter of a century since did any marked decay become visible in respect to a large number of streets north of Sackville-street, embracing Rutland and Mountjoy squares; Gardiner and Gloucester streets, Summer Hill, and contiguous streets. In fact, this northern portion of modern Dublin, as a built-on portion of the city (with little exception), dates back not more than a century and a half. From the middle of the eighteenth century until its close building was rife in the northern portion of Dublin, and during the period the streets named and scores of others were opened up and built upon. The houses in general were well built, were intended for and occupied by private families, and a large number of them were five stories high. These fine houses now are to a great extent tenement-houses, and the evils inseparable from such buildings under their new conditions are only too apparent. The northern part of the city, with its immediate environs, a century ago and much less, was a fashionable district much recommended by the medical faculty of the period, and much resorted to by invalids. A reaction set in fifty years since and upwards in favour of the southern environs of Dublin and sea-side districts along the bay extending from Irishtown and Merrion to Kingstown. The opening of the first constructed railway line in Ireland, the Dublin and Kingstown Railway, in 1834, gave a great impetus to this fashionable migration. As a link in the chain, the embarkation of George IV. at Dunleary (now Kingstown) led to the improvement of the harbour, and its appointment as the mail packet station, which it remains to the present day. Kingstown grew apace during the last half-century, and with it the other marine districts along the southern side of the bay. The extension of the railway line to Bray through the absorption of this first short branch in the Dublin, Wicklow, and Wexford Railway, further enhanced the southern sea-side environs for visitors and residents, and gradually thinned the northern city and suburban streets of their wealthy and well-to-do families. It is noticeable, however, that within the last dozen years a reaction is again setting in in favour of the northern suburbs a little further a-field, and that from Glasnevin through Drumcondra, to the marine or sea-side district of Clontarf, a considerable amount of house-building has taken place, and is still proceeding. Clontarf offers many advantages for villa residences, for it partly faces the bay, commanding a charming prospect of the Dublin and Wicklow chain of mountains across the water, and a fine inland background of the pleasant seats and farms on the plains of Fingal. The character of the new villa residences and other domestic buildings in the northern environs is not of a high order; indeed, the greater number of them belong to the cheap speculative class, which bespeaks indifferent materials, poor design, and poorer workmanship. In the southern suburban and non-marine townships, much domestic building has taken place within the last dozen years from Upper Rathmines and Rathgar, stretching to the Dodder river, and thence wending round to Donnybrook and Ball's Bridge. Some very fair classes of new villa residences are to be found in these districts, mixed here and there with houses of very flimsy construction, though efforts have been made to give them an ornate external appearance, out of keeping with their internal character and accommodation. Concrete cottage construction is developing to some extent in and about the environs of Dublin, but we have met with some wretched attempts with this material, which are a libel on its name, and do but little credit to the builders. Examination and inquiry on the spot, however, convinced us that the users of the material were the veriest building speculators, and that the mixed rubbish they used showed their unprincipled practices, and the valuelessness of their structures, which are fated to drop to pieces in a short time. *En passant*, we may observe that some excellent labourers' and farm cottages in concrete have been erected throughout the provinces of late, which fully meet the objects of their erection, — economy, durability, health, and comfort.

Pendent to our subject, we will now allude to the question of tenement-houses and artisan-dwellings in the City, matters that we have frequently discussed in relation to Dublin, as well as to English cities and towns. It has been stated that there are in Dublin about 25,000 houses, and of this number it will be near the mark to say 10,000 are tenement-houses,—houses originally built each for a single private family, but now inhabited, most of them by several families, often of the poorest class of workers. Many of these tenement-houses north and south of the Liffey ceased to be private dwellings half a century ago, and more; others only within a few years, but of course in proportion to the length of time that has elapsed since the change, the houses have become more and more ruinous and unhealthy. A large number of these tenement-houses have spacious rooms, and are situated in tolerably wide streets, but a much larger number are situated in back or side streets and courts, narrow, and often uncleansed for several days. In respect to some of the large tenement-houses in the wide streets, the fine garden spaces at their rear which they possessed when belonging to private families, have now to a great extent been built upon by the present owners of the houses, and the good stabling and coach-houses

attached have been converted into human dwellings. Thus, in once respectable localities there is a positive overcrowding unknown to the passers-by in the front streets, who little dream that there is a matted population in the back yards, garden ground, and even inhabiting the old stable-buildings in the lanes behind.

When we imagine houses of this character, five stories high, inhabited by from eight to a dozen families, with another living colony on the garden space behind, some conception may be formed of their sanitary condition and surroundings under their new aspects. It must also be remembered that in most of these houses the original accommodation that barely met the requirements of the residents when the houses were occupied by single families remains almost unchanged. It is needless to say the tenants of these houses, if they clean their rooms at all, are only concerned about the apartments they rent, and as to the staircases and halls, though they are in some cases washed down weekly by some common agreement among the tenants, by the employment of a charwoman, in numerous instances there is a total neglect of even this scant measure of cleanliness. In the southern quarter of the city, under the shadow of St. Patrick's Cathedral, there is a very large number of ruinous old tenement-houses which ought to be demolished forthwith, as they are dangerous to the public health and safety. Behind the northern line of quays extending to North King-street and further, and from the Royal Barracks easterly to the line of Capel-street, there are scores of streets, courts, and alleys, the houses of which form positive rookeries and fever nests. Hundreds of houses in these quarters cannot be improved, and it would be a mercy to demolish them if suitable provision could be made elsewhere for the evicted. This district, we have indicated, is the oldest part of the northern city, and the tenement houses and rooms over small shops inhabited in it are in as bad a condition almost as the much older class of houses in the south city, extending from the line of Bride and Werburgh streets, on through the Liberties and Coombe to Cork-street.

While a structural rearrangement is both feasible and advisable in respect to the best class of tenement-houses in wide streets only a few years ago abandoned by private families, to adapt them to the requirements of their present tenants, no structural alteration is possible in regard to the very old class of tenement-houses in the decayed southern and northern portions of the city above named. A wholesale demolition must sooner or later take place, and the sooner the better, if chronic hotbeds and nursing-grounds of contagion are to be uprooted, and the public health maintained. We have often pointed out that one of the most urgent wants of the town is the erection of a large number of healthy dwellings, not only for the artisan classes, but for the still lower classes of the working population. In London and some provincial towns some advance has been made in this desirable direction; but in Dublin little indeed has been yet effected. There are at present in Dublin an Artisans' Dwellings Company and an Industrial Tenement Company. The former has been a few years in existence, and has erected a number of blocks north and south of the Liffey. We have visited some of those blocks more than once, and though we admit they fulfil some of the conditions of their erection, and are an improvement on the ordinary tenement on the score of health, they do not meet the general want as regards arrangement, space, and rate of rent. The better class, or better-wage-earning class, occupying the rooms in some of these block dwellings, being able to rent more apartments, may feel satisfied; but the rents and spaces are not satisfactory to a class of tenants who are perforce obliged to do with less accommodation. Indeed, there is a class of tenants occupying the rooms of some of these blocks whose places ought to be occupied by their humbler brethren at reduced rents. The commercial principle, of course, is attended to by the company, and we must not talk of philanthropy, though it is quite possible and desirable to blend a little of the latter with the former when the healthy housing of the humble working-man and his family are concerned. We learn that the Artisans' Dwellings Company have about 270 tenements, containing upwards of 1,200 inhabitants. They have erected two-storied cottages, also containing four rooms, and some smaller ones. The larger cottages are let at 7s. 6d. per week, and the smaller sizes range from 3s. 6d. to 6s. The cottages let at 3s. 6d. contain two rooms, a settle-bed, scullery, water-closet, yard, and water supply. The lowest rent, which is 2s., is charged for two rooms in the large houses, but, in addition, it must be stated that separate water supply and water-closet are provided. In the South City, in the old district known as the Coombe, on a site recently cleared by the Corporation, another class of dwellings is being erected. These are on the separate cottage plan, and here about 200 cottages will be provided, and upwards of fifty elsewhere at Manor-street of a similar kind. Two-storied cottages, with sufficient accommodation in each for two families, in certain situations, would be a great improvement on the block or barrack-like dwelling plan. The building of a number of cottages on a quadrangular space, and having a square or open court-yard in the centre, may also under some conditions be judicious in a crowded part of the city. The pure and simple separate cottage plan is the best, and the most neat and appropriate in suburban neighbourhoods. Unlike London, ground is easily obtainable in sundry quarters in Dublin, and the cost of clearing sites in the old quarters of the city north and south would only amount to a tithe of what would have to be paid in London or the suburbs of the metropolis. The large class represented by labourers, porters, messengers, and other miscellaneous kinds of workers, earning from twelve to fifteen shillings per week, are utterly unprovided for in Dublin with house accommodation except of the most wretched and unhealthy kind. The Artisans' Dwellings Company have very few tenements indeed as low as two shillings a week, and in some of the tenement-houses in the city previously mentioned, two shillings have often to be paid for a single room. Several thousands, therefore, of the very poorest of the industrial classes of Dublin are occupying a single room in old tenement-houses, for which they pay a rent varying from 1s. to 1s. 6d. per week. The single rooms in old houses which can be got at 1s. per week are generally filthy and most unfit on the score of health or safety to life and limb. There are several sites in the northern and southern parts of the city which would be available at little cost for the erection of workmen's dwellings, and by the falling-in of leases, the Corporation of Dublin will, in a few months, be in possession of a large district which will be most suitable for the purpose and for opening-up new streets and carrying out other kindred sanitary improvements. The portion of the north-western end of the city, where this land will be available through necessary demolition and improvement, includes a locality, and is joined to others, which for long years have loudly called for sanitary inspection and building improvements. We explored this district years ago, and described its general condition, and we regret to note that much of the evil that produces the high death-rate of Dublin and adds largely to criminal statistics has had its birth in this district or portion of the city.

We must reserve for another paper some further city and suburban notes, respecting work done and undone, and sundry other matters bearing on the social and sanitary condition of the Irish capital.

FORECASTS OF THE CENSUS OF 1881.

THAT disturbance in the position of the centre of population which we recently showed to be in course of operation in London is active throughout the United Kingdom. From day to day fresh facts transpire as to the result of the census; and it will probably not be long before we have at least the approximate total of that vast enumeration. Indeed, the figure of 35,250,000 is already named as that of the total population of the British Islands, and this in spite of a positive diminution in Ireland. But even in England itself that process which has caused such anxiety among the longer-headed statesmen on the other side of the Channel has been partially going on. Eight of the English counties, it is said, show a decline in the numbers of their inhabitants during the decade. The mining industry of Cornwall is shown to be on the decline, and the agricultural districts of Hereford, Huntingdon, and Dorset are also reducing the number of their populations. This is partly explained by the comparison between the census of London and the result of the balance of births and deaths in the metropolis during the last decade. The estimate of the Registrar-General for the population of London by the midst of the present year was 3,707,000, so that fully 120,000 out of the actual population must be immigrants within the decade. If it prove to be accurate that the females throughout the islands exceed the males in the proportion of 18 to 17, one of those features which are held to characterise the physical decadence of a race will be disagreeably prominent.

The general movement of displacement of population, as between Great Britain and Ireland, during the last forty years, may be succinctly stated in a few pointed words.

Since 1841 the United Kingdom has added 30 per cent. of its then existing population to its numbers. This is an increase considerably larger than the total of the population of Ireland in 1841. Since that year, however (the deduction being allowed for in the above statement of increase), Ireland has reduced her population by 38 (accurately 37·95) per cent. So that while the United Kingdom has considerably more than doubled its inhabitants in eighty years (from 16,302,410 in 1801), Ireland, at the present rate of depletion, would eat up or vomit forth her entire population in little more than a century.

THE CLOSING OF THE PARIS *SALON*.

NOT a few of those who have watched in England with any interest the experiment that has been tried this year in Paris, of leaving to the entire body of the artists the management of the annual Exhibition so long known as the *Salon*, formerly under State government, will be surprised to hear that the first year's count of "the new management" has met with what may be considered a perfect financial success. More than 100,000 visitors over last year have passed through the turnstiles of the Palais de l'Industrie in the six weeks the exhibition has remained open, and a very considerable embankment has been obtained after defraying the charges, and by which the artists have been largely benefited.

In London, where what are understood by artistic interests are limited chiefly to the great institution in Piccadilly, it is difficult for people either in or outside society to understand how very generally in all degrees of the upper circles the subject of the fine arts is seriously entertained in Paris, and it is not easy for us on this side of the Channel to comprehend the influence and the significance of the success of this year's artistic experiment, and the direction it may give to the near future of the arts. Fortunately in Paris, although every now and then erratic "cliques" of artists make themselves conspicuous either in true faith or simplicity of feeling, or with the ever-ruling desire for popularity, there exists so strong a faith in the old traditions that the great men,—those who justly acquired their honours,—have always sufficient weight and influence to govern and control the wildest and most outrageous innovations; for even in that city of revolution, conservatism and *Conservatoire*-ism are always alive, though, if one may say so, always progressive.

In the new movement the larger body of artists,—the young artists, as we should call them,—have allowed themselves freely, and with the utmost good sense and propriety, to be led by the men whose work they have long looked up to and revered, and in this way has been secured the friendship, the assistance, and experience of those who have no interest whatever to serve but that of the great interests of art; and in this respect the French artists show their power of adjusting the apparently exceedingly different and uncongenial interests of business and art.

We believe that people have long since given up the idea that artists must be regarded as individuals having no knowledge whatever of the management of what are understood as business affairs. Every now and then stories crop up in England as well as France that show that, as a class, artists are not at all deficient in the occult transactions of the counting-house; the French artists especially show a very respectable ability in adjusting the sensitive character of their artistic pursuits with the more robust machinery of mercantile transactions. In fact, in Paris art has of late years acquired a dignity unknown in the past, inasmuch as many of its most distinguished followers have taken their place on terms of perfect equality, if not with the members of the great Bourse, at least with those of the *petits* Bourse.

What effect all this shrewd acquaintance with business may have on the art of the future some would say it is not difficult to determine; but it is certainly not a little remarkable that, during this "renaissance" of art, in which artists have been and are being so amply remunerated, there are members of the profession whose names are worthy of being ranked with those of the great artists of the past, and who have made themselves prominent and their families affluent. In London, though it cannot be said that the disposition is wanting with our artists to combine the profits of business and art, the ability shown in that direction, it must be admitted, is scarcely as great as it is with their brother artists abroad, for it is not alone in Paris where the business of art is successfully pursued; in whatever artistic seat one may visit, whether it be Rome, Florence, Munich, Dresden, besides a host of minor localities, what is called the life of the poor artist,—that delightful Bohemianism about which we have all read, dreamed, and heard so much,—exists only with the youngest members of the craft. Immediately the smallest success is obtained by the whilom Bohemian, good-bye to the dear old days of struggling study and almost lawless pleasure; good-bye to the artist's hat and the velvet coat, to the mysterious life at the old inn in the forest or by the river-side; good-bye to the stuffy *cafés* in the Quartier Latin; good-bye even to the gardens of the Villa Medici, the *caffé Greco*, and to those hard times that made life so easy and pleasant; good-bye, we have heard some architects say, to the drawing-board and the T-square, for now come the library-table, the diary, the day-book, the ledger, and the cheque-book; a studio in the Champs Elysées, the Parc Monceau or Kensington, a visiting-list, and,—a court suit.

PANTON-STREET, HAYMARKET.

THERE are many old inhabitants of London, and many occasional visitors to the metropolis, who will be able to remember when the Haymarket on certain days of the week,—we think it was twice a week,—presented all the bustle and business of a veritable market for the sale of hay; huge, heavily-laden country wains crowded the whole Haymarket, and the smaller streets adjoining, making the air fragrant with the produce of our pastures. Since then,—it was in 1830 that the market was removed to Cumberland Market, Regent's Park,—the odour of the Haymarket has slightly changed, and of late years it has very justly been considered as a far from savoury spot. Still, throughout its notorious history, it has retained on the eastern side, at least, a high degree of respectability, and the names of Garrard, M'Lean, of Turner and Brecknell, Fribourg, and many others, have bravely withstood, and now may be said to have conquered, the enemy on the other side.

Throughout its history, from the early days of the last century, when the "little theatre in the Haymarket" first obtained the name which, as a term of endearment it has ever since retained, when it was overshadowed by Vanbrugh's (Blenheim Vanbrugh's) big house, afterwards rebuilt by Novosielski, on the opposite side of the way, the Haymarket has been one of the famous streets of London, a street entitled to fame if for no other reason than that it once lodged, it is true at a moment of all but obscurity and certainly of poverty, that master of the English tongue, Addison, an incident in the great man's life which has furnished the brilliant pen of Macaulay with one of his most graphic sketches.

Whether any London authority informs us with exactness as to where stood the house in which Addison resided, we are not aware; indeed, such points are difficult of decision where no exact data exist, and when great changes have occurred. It was a contrast, this Haymarket garret which history tells us Addison occupied, and the home he was to own in later years in Holland House; there was but one point of similarity between them, and that was that they both lay in the fields. But Addison was a man of the world, his sordid surroundings in no way influenced his powers; he had at the time he was writing his "Campaign" travelled abroad, and drank in inspiration from the "classic ground" of Italy, the beauties of which he was to sing but a short time later. Not that the "Campaign" breathes much of the inspired poet. Addison had not then thought of his great work, for work the *Spectator* can be called, though pieced together day by day. If Panton-street cannot be directly connected with that great literary keystone of our language, its neighbourhood,—that, at least, may be conceded,—once sheltered the creator of the familiar characters and the suggestive thoughts that crowd the pages of that cherished work.

Cunningham, in his "London," has entered no mention of Addison's name in his notes on Panton-street, but in his "Modern London" he has inserted on his clue map to the Haymarket the notice of Addison having written his poem of the "Campaign" in a garret in Panton-street.* Taking this for authority, the house he occupied may very possibly have been one of those that have so lately been demolished to make way for the new Alexandra Theatre, a notice and view of which was published in these pages a fortnight ago.

This new "little theatre near the Haymarket" is progressing rapidly towards completion in quiet Panton-street; James-street, at the back, is another quiet seventeenth-century street; the back entrance of the theatre is, indeed, within a few feet only of the old tennis-court, which bears on a quaint label let into its still stout walls, "James-street, 1673," a court which, at the time when Addison lived in the neighbourhood, was in its hey-day of success. It is not, indeed, difficult even now to imagine the noise and gaiety of the game and the even more boisterous fun at Piccadilly Hall, to which the old tennis-court was attached, disturbing the quiet habit of the thoughtful writer.

Of this Piccadilly Hall, a fashionable gaming-house of the seventeenth century, this old tennis-court of James-street is all that remains, and is still easily detected by its appearance, though no longer echoing to the strange jargon of the marker's language; it is, we believe, now occupied by an army clothier. Of the numerous racquet-courts that in the seventeenth century were so popular, it is one of, if not the last, remaining relic, to speak to the generation of lawn-tennis players, of the complicated and antique pastime of our great-great-grandfathers.

As for Panton-street itself, it obtained its name from Colonel Panton, the last owner of Piccadilly Hall. Lord Arundel of Wardour, to whom Wardour-street,—the happy hunting-ground of so many a collector,—owes its existence, married a Miss Panton. On its south side stood Hickford's auction-rooms, the Christie & Manson's, the Hôtel Dronot, or the Clinton Hall of the days of George I.; from a catalogue of a sale in 1728, we learn that a back entrance, on a level with the street, "facing the Tennis-court in James-street," was available for the sedan-chairs of Messrs. Hickford's fashionable patrons. Hickford's, therefore, we see, stood on the site now occupied by the Alexandra Theatre, whose success we may hope will continue to keep alive the memories of this once fashion-haunted corner of old London.

* Pope asked Walter Harte to ascend three pairs of stairs and enter a small top room above a small shop in the Haymarket; when they were within the room, Pope said to Harte, "In this garret Addison wrote his 'Campaign.'"—See "Handbook for London."

BENTLEY PRIORY.

AMONG the pleasant "Homes and Haunts" just now for sale is Bentley Priory, near Stanmore, for a quarter of a century past the seat of Sir John Kelk, and previously that of two successive Marquises of Abercorn, the property having been purchased towards the end of the last century by the grandfather of the present Duke of Abercorn.

Though it cannot compare in literary associations with Holland House, yet under the rule of the Hamiltons the place was frequented by many of the most distinguished statesmen, poets, historians, and essayists. Pitt would often spend a night here discussing his bottle of port wine with his friend, who owed to him his marquisate; "the travelled Thane, Athenian Aberdeen," lived here for many years, being the stepfather of the present duke, and guardian during his minority; the Duke of Wellington, George Canning, Lord Sidmouth, Lord Liverpool, Spencer Perceval, and Sir Robert Peel were all on the list of the Marquis's occasional visitors; as also were Sir Walter Scott, Southey, Wordsworth, and Samuel Rogers. It is said, at all events, by local tradition, that Sir Walter wrote some portion of "Marmion" in a summer-house in the grounds, and that the same peaceful and tranquil scene inspired Rogers with several lines of his "Pleasures of Memory." Lady Morgan, too; Thomas Moore; and the witty Canon of St. Paul's, Sidney Smith, at various times enjoyed here the hospitality of Lord Abercorn.

The Priory has also more than once welcomed royal personages and even crowned heads. Mr. Thorne, in his "Hand-book of London and its Environs," informs us that George IV., when Prince Regent, came hither with the King of Prussia in order to meet Louis XVIII. Thirty years later, namely, in 1848, the house was taken on a three years' lease by the Queen Dowager, Adelaide, but, unhappily she did not live long to enjoy it. She was in very bad health when she took up her abode here, and she survived her arrival only about a year and a half, dying here in December, 1849. Many of the old people remember her gracious acts of kindness and charity among the poor of Stanmore and Harrow Weald, and well recollect her appearance when she took her carriage drives round the neighbourhood on fine afternoons. We believe that the last occasion on which she appeared in public was when she laid the first stone of the new Parish Church of Stanmore, which almost abuts on the edge of the Bentley Priory Estate.

Lord Abercorn, the then owner of the Priory, had made up his mind to reside almost entirely in Ireland, and consequently the place was scarcely inhabited at all for some three years after the queen's death. It was bought in 1852 by Mr. (now Sir) John Kelk, the well-known contractor, who represented Harwich in the House of Commons for a few years as a supporter of Lord Derby and Mr. Disraeli, and was created a baronet in 1874. Two of his sons having died in early manhood, Sir John and Lady Kelk took a dislike to the place where the sons had spent their boyhood; and, having recently purchased a larger property, Tedworth Park, near Andover, Sir John Kelk has resolved to dispose of the Priory.

The estate at present consists of 466 acres, though, owing to the well-wooded and undulating character of the domain, it looks far more extensive. It "lies within a ring fence," being surrounded on every side by public roads; but, in spite of this fact, no mansion in the three kingdoms is more secluded. Indeed, even when you have walked for some distance in the park, the house does not come into view, although it stands on high ground, nearly on a level with the summits of Harrow and Hampstead Heath. In fact, a stranger might easily lose himself in the course of his search for its exact position.

The park, being so surrounded by roads, has no fewer than six different lodge-gates, from each of which the Priory itself is approached by serpentine drives, between large and almost impenetrable shrubberies of laurels, rhododendrons, and other evergreens, among which are several fine yews, the ancient guardians of the spot when it was still a part of the "weald,"—a forest in reality. By whichever gate, however, the visitor arrives, he must enter the house on the northern side, the carriageway passing under an ivy-covered *porte cochère*. Double folding doors open into a spacious entrance-hall, adorned with a groined ceiling, which is supported by fluted columns in the Classical style. On the left of this hall is an inner hall, containing the grand staircase. This is of Portland stone, with carved balusters of oak, of an elaborate pattern of modern design. The handrails are of ebony. It was erected by Sir John Kelk, and is one of the few alterations made in the general arrangement of the house.

The principal rooms into which we enter from this hall are the billiard-room and picture-gallery, which is circular, and lighted by a glass dome from above. This opens, on one side, into the dining-room, and on the other into the chief drawing-room, the latter being 50 ft. by 30 ft., with a painted ceiling, the fireplaces surmounted by large marble mantelpieces, and the panels between and over the doors showing paintings of classical subjects. The library, which adjoins, has also a fine mantelpiece supported by Siena marble columns. On the same floor are two rooms of much smaller dimensions, now called the "morning-room or study," and the "gentlemen's room." These rooms are of especial interest, as they were those usually occupied by the Queen Dowager, who used the former as her sitting-room, and the latter as her bedroom. In the latter there is a recess,—a sort of alcove, such as is often to be seen in bedrooms in France. In this alcove stood the Queen's bed, and here she breathed her last. Her private boudoir was a room on the first

floor, nearly over her sitting-room. These rooms all have a southern aspect, and were chosen by her on account of their warmth and comfort.

It should be mentioned here that from this morning-room a doorway opens to a corridor or vestibule, with steps leading down into an Italian garden, and with an entrance also into a magnificent conservatory, 126 ft. in length, the central walk of which is paved with marble inlaid with tesselated tiles. In this is a fountain for gold fish. The Italian garden and its terraces extend along the entire south front of the mansion.

Beyond the conservatory is a lawn-tennis court or skating-rink, some 90 ft. in length, and lighted by gas, with a raised gallery for spectators at one end. At the western end of all is a lofty clock-tower or campanile, of the Italian style, from the summit of which an extensive view can be obtained, reaching into ten counties.

The great oak staircase, already mentioned, leads up to the "state apartments" on the first floor. These face the south; their windows open on to a broad verandah, commanding a fine view over Middlesex and Surrey.

Below the Italian garden and lawn the ground slopes away rather abruptly down to a lake about four acres and a half in extent, with a boat-house, bathing-house, &c. The sewage of the house and premises is carried by pipes into a small watercourse below the lake.

On the banks of the lake is a summer-house. Here, it is said, that Sir Walter Scott corrected the proofs of his "Marmion," to which he added, at the suggestion of his host, the Tory Lord Abercorn, a couplet, in which he speaks of Fox,—

> "For talents mourn untimely lost,
> When best employ'd and wanted most."

Of these lines, Lockhart tells us in his Life of Sir Walter, that they came actually from the pen of the Marquis; but this can hardly have been true to the letter. It is far more certain that in the adjoining alcove some lines of the "Pleasures of Memory" were penned by Samuel Rogers.

The visitor should not leave Bentley Priory without paying a short visit to the "Cedar Garden," on the north side of the house; he will not easily find one more beautifully adorned with cedars of Lebanon, yews, and other evergreens; and he cannot fail to be struck with the circular rosary and the orangery.

We have said nothing here of the fernery, the lime-tree avenue, and the rustic summerhouse, consisting of two rooms, in the midst of rockery, and evergreens, and ferns. This used to be Queen Adelaide's favourite resort on fine summer afternoons, and in the quiet seclusion of this spot she would sit for hours, reading and working, or conversing with her ladies-in-waiting.

The stables are capacious, containing ten large stalls; besides which, there is another building capable of holding forty visitors' horses.

It must be owned with regret that antiquaries and county historians like Lysons can tell us but little of the back history of Bentley Priory. All that is known of it seems to be that in the days before Henry VIII. there was a priory here, though the order to which its members belonged is unknown. Of course, like other religious houses, it was seized and suppressed along with the rest of the lesser monasteries; its revenues were, however, assigned not to the king, but to the monks of Canterbury. We learn that "in 1543 Archbishop Cranmer gave to the king, in exchange for other lands, the late Priory of Bentley, with all lands, tenements, &c., thereunto belonging in Harrow and Stanmore, being parcel of the possessions of St. Gregory's Priory at Canterbury."

The king, as soon as he got possession of the lands, granted them to two of his friends named Needham and Sacheverel, who sold them a few months afterwards to Elizabeth Colt. We hear little or nothing of the subsequent history of the estate until the reign of Queen Anne, when it would seem to have been in the hands of the Coghills. A member of that family, in 1734, left it to a nephew, who again bequeathed it to a relation of another name. Having passed through the hands of a Mr. Bennett, a Mr. Waller, and a Mr. Doberly, in 1788 it was bought by the Earl, afterwards first Marquis, of Abercorn. It was this nobleman who expended a large part of his Irish and Scottish rents in making large additions to the original house, and made it one of the "stately homes" of Middlesex. Sir John Kelk has left the fabric much as he found it, adding only the projecting Italian central front on the south.

ON THE MAINTENANCE OF PURE AIR IN DWELLINGS.*

THE question of how best to maintain pure air in a house has an important influence in domestic economy, because the health and the vigour of the inmates depend upon their living in a pure atmosphere.

The inhabitants of close rooms, persons who breathe air which has already been breathed, are subject to diseases which may cause death, amongst which may be mentioned pulmonary consumption and certain classes of fevers. But whilst some persons may be killed outright by breathing air which has been polluted by the breath of other persons, the majority are subject to a low condition of health. The reason of this is partly because the oxygen of the air is necessary for keeping in activity the chemical processes which are bound up with life, and that in the act of breathing, that is, in taking air into the lungs, the oxygen in the air is taken up by the lungs and the expelled air is thus deprived of its oxygen; and partly because an individual in expelling the air from his lungs in the act of breathing expels with the air carbonic acid gas, which in large quantities is fatal to life, as well as a large quantity of organic matter, *i.e.* a portion of his body, which latter has a tendency to putrify rapidly in stagnant air, and which may thus become a dangerous poison.

Those who live in a close atmosphere have their vital energy impaired; they are less able to perform work. They more nearly approach to the condition of animals in a state of hybernation; they are less able to enjoy life. There is a case mentioned of a dressmaker who employed a large number of women in a very close room at a low rate of wages. Upon a remonstrance being made as to the condition of the atmosphere, ventilation and fresh air were supplied to the room. The women then complained that their wages were insufficient, because in consequence of the fresh air they were so much more hungry and required more to eat. That is to say, their vital energy was increased; and no doubt their capacity for work was much increased also. The same thing occurred when ventilation was introduced into soldiers' barrack-rooms, through the efforts of Lord Herbert of Lea. The soldiers complained of the insufficiency of their rations, which had to be supplemented.

Mr. Leeds, a ventilating engineer of New York, mentions an experiment which he made with some flies illustrative of this. He confined a certain number of flies in a bottle full of breathed air and tightly sealed up. He also confined a certain number of flies in a bottle through which he allowed fresh air to circulate. The flies in the bottle filled with pure air were very lively, but they all died in twenty-four hours, as they had no food. The flies in the impure air became at once very stupid and could not fly about, but they lived ten times as long as those in the pure air. And thus we find that many poor people living in unventilated houses exist sometimes to quite an advanced age, but they are often sick and feeble. Therefore, when a person finds he cannot earn his living, or if he does earn it he is sure he cannot get sufficient food to eat, he had better imitate the hybernating animals as nearly as possible, and get into some close, unventilated place, and lie down in perfect quiet and repose, and not fret at all, and he will then be able to get along on very little food. But, if full employment is to be made of their faculties, persons must live in pure air.

Stagnant air can never be pure air. There are being given off perpetually into the atmosphere a number of deleterious substances,—the emanations from the breath and other exhalations of every living creature, — the emanations arising from the putrefaction of dead creatures or of decaying vegetable substances, the miasma from marshes, &c. These various poisonous emanations are being constantly changed into non-poisonous forms, or burnt up, as it were, by contact with the oxygen of the atmosphere, which is itself being continually renewed from other sources. The movement of the atmosphere facilitates this burning up of the poisonous emanations.

The atmosphere is always in movement. The Registrar-General gives the average movement of air as measured by an anemometer at Greenwich to be about 17 ft. in a second, or 12 miles an hour. It is rarely less than 6 ft. a second, or 6 miles an hour. Thus, if a single individual be assumed to occupy a space of 6 ft. high by 1 ft. 6 in. wide, situated in the open air, there would pass through this small space in an hour nearly 200,000 cubic feet of air, even when the movement of outer air is as low as four miles an hour.

In order to maintain purity of air in a house, it is necessary to keep up a continual movement of the air, supplemented by a continual change in the air. This movement and change of air must be maintained without causing a sensation of draught. The science by which this is effected is termed ventilation. It is a science of much simplicity in climates or in weather when the windows and doors can be kept perpetually open; but in this climate, especially in winter, the necessary condition of the avoidance of draughts makes it a very complicated matter, and renders it necessary in providing for a change of air to provide also for warming the inflowing air. The great differences of temperature which occur in this country, moreover, produce numerous other complications.

In considering the question of ventilation, the first question which arises is as to the quantity of fresh air which is required for change of air. If it were desired to supply in a room a volume of fresh air comparable with that supplied out of doors, it would be necessary to change the air of the room from three to six times in every minute; but this would be a practical impossibility. And even if it were possible, it would entail conditions very disagreeable to the occupants, who would have to live in a gale of wind. It is thus evident that in considering the condition of air indoors, we have to seek a standard of admissible impurity in the air, rather than a standard of purity of air comparable with what we have out of doors.

In judging of the amount of impurity which may be allowed in an inhabited air space, the sense of smell, when carefully educated, affords the best indicator of the relative purity and impurity of different kinds of air.

The volume of air which is required to maintain the air of a room at a uniform standard varies with the character of emanations given out by the occupants of the room. For instance, the emanations given out by sick persons, and especially those from bad surgical cases, require for their dilution a greater volume of air than is requisite in the case of healthy persons.

Calculations have been made which show that, theoretically, about 3,000 cubic feet of fresh air per hour per individual should be afforded to preserve the air in a confined space at the required degree of freshness; but, in our climate, a careful practical examination of the condition of rooms in barracks and hospitals, judged of by the test of smell, shows that arrangements which appear to provide for a much less amount than that obtained by theoretical calculation, will keep the air of rooms occupied by healthy persons in a fair condition. These results have pointed to about 1,200 cubic feet of air per hour per individual.

This variation from theory seems to be partly due to the fact that there is always a change of air to a certain extent going on in a room. The walls and ceilings themselves allow of a considerable passage of air through them, which is proportioned to the difference between the temperature outside and inside a house, and varies with the materials of which it is constructed. Thus, ordinary bricks are nearly twice as pervious to air as sandstone, and plaster is much more pervious than brick.

If you look at the ceiling, you will see that an old ceiling is blackened where the plaster has nothing over it to check the passage of air, and that where the joists come, and the air has not passed so freely, it is less black. If you break the plaster, you will find that its blackness has arisen from its having acted like a filter, and retained the floating particles of dirt while the air passed through. Ill-fitting doors and windows allow of the passage of a considerable quantity of air.

A sleeping-room is very warm at bed-time; a rapid fall of temperature outside occurs, and at once a considerable movement of air takes place. The majority of occupiers of sleeping-rooms in England close their windows at night; they often block up the chimney by a register or otherwise to prevent the blacks falling. They have no special inlet or outlet for changing the air. In the morning the room would, no doubt, be very close; but if it were not for the continual insensible change arising from the air

* Paper by Captain Douglas Galton, C.B., F.R.S., read at the Domestic Economy Congress, Royal Albert Hall, on the 23rd ult.

passing through the walls, doors, and window-chinks, &c., the occupants would be asphyxiated. A well-built house unprovided with special means for the inflow of fresh and outflow of vitiated air, is a real source of danger. For these reasons the form, position, and surroundings of a building are important, because the air thus insensibly coming in, as well as all other air admitted, should be taken from pure sources.

Rooms with a large amount of outside wall-space have a better chance of obtaining fresh air than rooms whose walls separate them from other occupied rooms; because the air, filtering in from an occupied room, would necessarily contain more impurities than fresh outside air. The inflow of air to a room takes place not only from all sides, but also from below. The air does not cease where the ground begins, but air permeates the ground, and occupies every space not filled by solid matter or by water. Thus, if you build on a dry, gravelly soil, where the interstices between the stones are naturally somewhat large, you practically build over a large stratum of air. This air moves in and out of the soil in proportion to barometric pressure, and with reference to the wind.

The fact of this continual free passage of air in and out of the ground makes it important that the ground we live on should be free from impurities. We might just as well (indeed, probably far better) live over a pig-stye than over a site in which refuse has been buried, or in which sewer-water has penetrated, or over a soil filled with decaying organic matter; because in cold or damp weather, when the air in the dwelling is warmer than the air outside, the upward movement of this warmer air will draw in air to supply its place from the ground on which the dwelling stands. This movement would be prevented if the whole surface under the dwelling were covered with an impervious material.

It has been the custom of many London builders to lease a site, to remove the valuable gravel and sand, and in order to fill up the hole thus caused, to invite people to deposit rubbish, often including foul garbage, on the site; and when the hole is thus filled up, to build a house over it. People are then astonished at fevers and sickness prevailing in new houses.

The size of a room does not permanently affect the purity of air in the room; that is to say, that the number of occupants in a large room being the same as the number in a small room, the same amount of air admitted and removed will eventually keep the two rooms in the same condition of impurity.

The degree of impurity in the air of an occupied room ultimately depends solely on these two things:—

1. The rate at which emanations from the occupants are produced.

2. The rate at which the air of the room is being replaced by fresh air.

The advantage of large space is that the large room is longer in reaching the state of normal impurity than the small room. For instance, the following table shows the time required to bring air to a definite uniform standard of admissible impurity (viz, 0·2 per 1,000 of CO_2), in different sized rooms:—

		H.	M.	S.
One man in	10,000 cubic feet	3	20	0
,, ,,	5,000 ,, ...	1	40	0
,, ,,	1,000 ,, ...	0	20	0
,, ,,	600 ,, ...	0	12	0
,, ,,	200 ,, ...	0	4	0
,, ,,	50 ,, ...	0	1	0
,, ,,	30 ,, ...	0	0	36

But besides this, the inflow and outflow of air necessary to maintain the standard of impurity is less perceptible in a large than in a small room; for the chief difficulty of keeping ventilation in action arises from the draughts it causes. Every one objects to a current of air which affects him, and desires that if a window is to be opened it shall be situated behind some one else. There is, moreover, in practice, this advantage in the larger rooms, viz., that the larger wall surface and the more numerous windows will allow of a larger insensible ventilation, and thus larger rooms will have an apparently less degree of impurity than small rooms. Although the uniform diffusion of carbonic acid is very rapid in the air of a room, the organic emanations given out do not in practice diffuse themselves either rapidly or uniformly. They hang about in corners where there are obstructions to the flow of air, or near the ceiling. On this account, some space between the occupants of a room is desirable. In sleeping-rooms and in hospital wards, and, in fact, in all rooms where the height is above 10 ft. or 12 ft., the floor-space becomes of more importance than cubic space. For adults in sleeping-rooms it is undesirable to have a floor-space for each of less than 50 superficial feet. And the floor-space in dormitories in schools should certainly not be less for each boy or girl than a space of 50 superficial feet, or say 10 ft. by 5 ft. or 6 ft. 3 in. by 8 ft. In hospitals, from 90 to 120 superficial feet of floor space is generally afforded; and in fever hospitals, and in surgical wards, much more floor-space is frequently desirable.

As before mentioned, the ventilation of a room means the removal of a portion of the air in the room, and the supply of a similar quantity of fresh air to take the place of the vitiated air thus removed.

This change of air may be effected in two ways,—1, by forcing fresh air into the room and allowing this fresh air to displace the air already in the room; or, 2, by drawing the air out of a room and allowing the fresh air to flow in to fill its place. In some cases a combination of both methods is adopted.

The extraction of the air is that which is simplest and most generally adopted. The extraction may be effected by fans or pumping machinery, but the usual system is to depend upon differences of temperature for determining the movement of air. The molecules of air are but feebly attracted to each other, and increases of temperature or diminutions of pressure separate the particles from one another. Similarly, decreases of temperature bring the particles nearer together, and thus one cubic foot of warm expanded air weighs less than a cubic foot of cold air.

It follows that as warmed air expands it ascends, and as cooled air contracts it falls. It also follows that as the warmed air ascends the air around rushes in to fill its place. Everywhere this heating and cooling of the air is going on; the sun's rays, the proximity of a warm body, the vicinity of a cool shaded surface, all cause movements in the currents of air.

In a room, as air is warmed by the bodies of the occupants, it ascends; it comes against the glass of the windows, cools, and falls down. Draughts felt near the windows are not necessarily air coming in from the window, it may simply be the cooled air falling. It is on this law of the dilatation of air that all the movement of air depends, from the winds and hurricanes, to the ventilation of our houses, except where we propel air by fans or other mechanical appliances.

The law which regulates this movement of the air in a confined space or a room, when the temperature is higher than that of the outside air, depends upon the following considerations:—

1. Upon the difference of temperature of the air inside the confined space, as compared with that outside.

2. Upon the area of the aperature through which the air passes.

3. Upon the height of the column of ascending air.

Thus velocity of air in a chimney or flue depends on the height of the flue and temperature of the air as it ascends. Therefore, a fire lighted at the bottom of a flue produces a current upwards in the flue. The extraction of air by flues is the plan usually adopted.

The extraction of air by a properly constructed fan, worked by a steam-engine, would be more economical than the flue extraction, especially when the warming of the air, which takes the place of that removed, is taken into account; but the strong recommendation of the chimney is its simplicity and its permanence. It requires comparatively little repair, and no skilled labour to look after it. The convenience of this system causes it to be almost universally adopted. The open fireplace is one example of it; the sun-burner is another example; but the system is also applied in every room in which there is an opening at the upper part, out of which the warm air can pass, and an opening below, through which fresh air can flow in. Thus, an ordinary sash-window is an example. If the top sash is lowered and the bottom sash raised, the warmed air passes out of the room at the top, and the cooler outer air flows in below.

In the open country air is always in movement. In a town the buildings tend to prevent the rapid circulation of air; and, therefore, the smoke from the houses and the impure emanations from stables, from unclean street surfaces, and from ash-pits, hang about and render the air impure.

In a house the space is so sub-divided that air is necessarily stagnant unless special arrangements are made to provide circulation. Of course, in the summer and in warm weather, it is comparatively easy to obtain circulation of air throughout a house, and to fill the house with pure air by opening windows and doors. But in winter and in cold weather or wet weather, when doors and windows are closed, it is necessary to provide special means for creating a circulation of air.

A change of air in a room means that the air in the room which is deteriorated by the breath of the occupants shall be replaced by fresh air. In cold weather it is necessary to provide in some manner for warming this fresh air, or else the temperature of the room would be so lowered as to be injurious.

In most London houses, the ventilation of the room in winter, and the warming of the air, depend on the open fire-place; and there is no better engine for the ventilation of a room. The way in which an ordinary open fire-place acts to create circulation of air in a room with closed doors and windows is as follows:—The air is drawn along the floor towards the grate; it is then warmed by the heat which pervades all objects near the fire, and part is carried up the chimney with the smoke, whilst the remainder, partly in consequence of the warmth it has acquired from the fire, and partly owing to the impetus created in its movement towards the fire, flows upwards towards the ceiling near the chimney breast. It passes along the ceiling, and, as it cools in its progress towards the opposite wall, descends to the floor, to be again drawn towards the fireplace. A fireplace is thus powerful enough to draw into the room all the air it wants, and for this purpose will use indiscriminately all other openings, whether inlets or outlets, if necessary.

The rays from the fire pass through the air of the room without warming it; but they warm the surfaces, on which they impinge, of the walls and furniture, and thus communicate the heat to the air. Thus, in a room with an open fire-place, every object in the room contributes its heating surface to warm the air, which is drawn in cold from the outside by the fire.

But the cold air is liable to produce draughts. The only way to prevent draughts is to adopt means for providing fresh warmed air to supply the place of that removed. This may be effected in various ways. The fresh air may be brought to the back of the fireplace and there warmed by some of the spare heat which otherwise would pass up the chimney. By this means each room would be self-contained, so far as its heating and ventilation are concerned. Or, if preferred, a stove may be placed in the basement of a house, and fresh air brought to this stove to be warmed, and then conveyed by flues in the walls to the several rooms, and then admitted in convenient positions; or else the stove may be placed in the staircase or hall of a house, and fresh air be brought to it to be warmed, so that the staircase or hall shall form a reservoir of fresh air, from which the open fires in the several rooms draw supplies of air through the doors or through special openings.

Any of these arrangements will prevent draughts being felt in the rooms. Wherever an open fireplace is used, there should be some arrangement for the supply of fresh warmed air in winter to replace the air carried up the chimney; but as the fire itself warms the walls, and all the articles in the room, by its radiant heat, it is not desirable that this fresh air should be warmed to any great extent. Probably a temperature of 54° to 56° would be ample, as it would soon acquire in each room the supplemental heat which the occupants would desire. The lower the temperature of the fresh air, the larger would be the quantity of oxygen contained in a given bulk of air. Thus, a person breathes on an average when tranquil 16½ cubic feet of air per hour. A cubic foot of dry air at 32° contains 130·375 grains of oxygen, and with the air at 32° he would receive 2,164 grains of oxygen into his system. At 80° temperature, the air contains only 118·7 grains in a cubic foot, and in breathing 16½ cubic feet of air at 80° he would receive into his lungs only 1,971 grains of oxygen, or only about 90 per cent. of the oxygen which he would inhale at the temperature of 32°. Therefore, the lower the temperature at which air can be supplied

for breathing, consistent with comfort and the avoidance of draught, the better.

There is so great an advantage in the open fire-place as an engine of ventilation for rooms, that although many other and more economical means of heating our rooms have been suggested, it is questionable whether, on the ground of health, it would be wise to give it up.

One great evil from which we suffer in London is the smoke in the atmosphere, and this is aggravated by our open fireplaces, but not necessarily. The smoke is not only an evil in itself, but it aggravates the effect of the fogs which prevail, especially in this country. It seems that the tarry matter given out by the combustion of coal coats over the watery particles which float in the air in time of fog, and thus retards the evaporation, and causes the fogs in towns to be more continuous than they would otherwise be. The fog and smoke are a serious inconvenience to ventilation in London, because ventilation means the supply of pure air. The outside air in London is impure, and the only way to obtain comparatively pure air in the house is to pass the fresh air drawn in through cotton-wool filters. This entails a considerable amount of trouble, as the cotton-wool filter will, in foggy weather, have to be renewed every three or four days. But even on the finest days in London, when the air is what is called clear, it will be found that the atmosphere is loaded with impurities. There is some smoke, much dust, of which the chief part arises from the enormous amount of horse-manure spread over the streets, and many other impurities incidental to a thickly-peopled area. These impurities, and even the fog and smoke over a town such as London, do not rise to any very great height. The tops of the church-towers, and of the loftiest houses, have been sometimes observed to be in a clear atmosphere on days when the streets are wrapped in fog. At the level of the tops of such lofty structures a much purer air may always be found than prevails near the street level, and this purer air could be brought down for the supply of houses. In all public buildings in London, especially in the Houses of Parliament, the supply of fresh air should invariably be from this purer source.

But this question should be looked at from a wider stand-point. The population of London, at the beginning of the century, did not exceed 960,000. It is now nearly 4,000,000. Thus a population not much smaller than that of Portugal, which is spread over 34,500 square miles, is concentrated in London on to 118 square miles. The houses spring up on the outskirts of London on every piece of spare land. Each house contributes to the smoke of London, and this smoke-contributing area, and the inhabited area which contributes impurities to the atmosphere, grow more rapidly than the arrangements made for removing the impurities, or for diminishing smoke.

We have had much legislation upon the subject of improving the purity of our rivers and water-supply, but pure air is as important to us as pure water, and this question has been practically left untouched. There are Acts of Parliament prohibiting smoke, but, unfortunately, these have been left to be a dead letter, because of the private interests which they assail.

Those who live in the country find the pure air come to them on all sides, because of the constant movement which goes on in the atmosphere. Those who live in London must turn their attention to some method of diminishing the impurities with which London air is charged, or of putting in movement the atmosphere so charged with pollution. The first and most obvious step is to relieve the air from the enormous amount of smoke which is now daily thrown into it, and the next is to remove all refuse from the streets and houses as rapidly as possible. As a contribution towards the well-being of the country, each householder should be bound to adopt some method of preventing smoke in his household.

The question of the avoidance of smoke is essentially one which comes under the cognisance of a Domestic Economy Congress, because smoke means waste; the consumption or prevention of smoke is the utilisation of waste, because when smoke proceeds from a fire it shows that a large part of the fuel is going away into the atmosphere unconsumed. There have been many suggestions made to prevent smoke,—the form of the fireplace, the use of anthracite coal, the use of gas instead of coal, or the use of gas in combination with coal.

One of the first persons who turned his attention to the prevention of smoke was Dr. Arnott. He proposed a fireplace which practically produced no smoke; but it had this inconvenience, that it gave a very dull fire. This inconvenience might, however, be easily remedied by a not very great alteration in the arrangements for admitting air to the top of the fuel.

It would be beyond the limits of this paper to enter upon the very large question of the various forms of grates, or of the other means for preventing smoke, and such a discussion would now be premature, as a committee has been formed for the purpose of testing, in the course of the coming autumn, various new forms of fireplaces devised to prevent smoke.

There is scarcely any question at the present day more important to the inhabitants of London than that of devising means to purify the atmosphere. Parliament can make general laws prohibiting smoke, but the enforcement of the laws must rest with the local authorities. In London, unfortunately, the authorities whose duty it is to enforce the existing law have been very supine in the matter; and London suffers far more than ought to be permitted from the smoke of factories and large chimneys. As regards the chimneys in private houses, although each gives out only a small quantity of smoke, the aggregate of smoke contributed by them is as serious an element in the pollution of London air as that from the factories. The source of pollution is beyond the reach of present legislation. It is a matter dependent upon the action of each individual householder. The most serious cause of air pollution in each house may be said to be the kitchen chimney, or the chimney of the hot-water apparatus. These must be in operation winter and summer. There are, however, numerous arrangements for cooking and for supplying hot water which do not give out smoke, and which are far more economical of fuel than the ordinary kitchen grate. The use of these would not affect the comfort or the ventilation of the living-rooms. The use of one or another of these arrangements would entirely abolish smoke from kitchen chimneys, and if kitchen chimneys and fuel used for cooking ceased to give out smoke, the atmosphere of London would be sensibly purer than it now is.

The other cause of impurity in London air,—viz., that arising from dust,—is more a matter for the local authorities than for the individual householder. The streets should be washed every morning, and swept more than once a day; the dust-carts should be covered; dust from dust-holes should not be brought up in open baskets and emptied, as it now is, into the open carts, so as to scatter the largest possible amount into the atmosphere, and in the face of the persons passing by; but dust should be daily collected from every house, and received in closed receptacles, to prevent any of it being spread in the atmosphere.

If the local authorities would set themselves seriously to work to prevent the pollution of London air in this direction, and if every individual householder would take the trouble to adopt some method of diminishing the smoke from his own house, a sensible effect would soon be produced on the cleanliness of London and on the purity of its atmosphere.

A SCOTTISH ARCHITECTURAL EXCURSION.

LINLITHGOW: BINNS HOUSE: ABERCORN CHURCH.

THE annual excursion of the Edinburgh Architectural Association took place recently, and was largely attended. Under the arrangement of Mr. John McLachlan, president, they proceeded to Linlithgow, to examine the remains of the Palace and St. Michael's Church, which is still used as a place of worship. Mr. Kerr, architect, Edinburgh, in describing the palace, noticed that the name, Linlithgow, was of ancient origin, signifying the Lake of the Sheltered Valley, which even now applies to the natural features of the site, which is supposed to have been occupied as a Roman settlement, as pieces of pottery and other remains have been dug up from time to time. In some of the older records reference is made to a chapel, which is believed to have existed here along with some other buildings, as David I. of Scotland occasionally resided here, about 1134. Much reliable information is now available regarding this and other buildings from the Lord Treasurer's accounts and original ancient documents recently published by the Government, from which it appears that Edward I. erected a peel about 1300, and spent Christmas of 1301 here. This peel was taken by stratagem, and dismantled, by order of Robert the Bruce, in 1313, but it appears to have been repaired, and additional buildings erected. These, with the parish church of St. Michael adjoining, were destroyed by fire in 1424, the year in which James I. returned to Scotland, with his Queen. In 1425 he began the erection of a new palace and to rebuild St. Michael's Church. The portions of the palace supposed to have been erected at this time were upon the west and south sides; about 1488 part of the south side appears to have been in progress. In addition to the kings already named, Robert II. and III. resided frequently in the castle or palace. James I. visited it about 1428, and the Royal Family of Scotland occasionally occupied it up to the time of James VI., who left Scotland to ascend the throne of England on the 5th of April, 1603. His son, Charles I., was the last of the Stuart kings who visited Linlithgow Palace. Prince Charles Edward also visited it in 1745, and in the following year it was burnt, when occupied by Hawley's dragoons, and reduced to the state of ruin in which it now appears. The palace forms a quadrangle around an inner court, having high towers, with stairs, at the corners and in the middle of the north side, connected together by lower buildings. The fountain in the centre of the court was erected by James V. about 1538. There was also an outer court towards the south, enclosed by walls at the east and west ends, St. Michael's Church and the outer porch of the palace forming the south boundary. Looking at the building chronologically, the oldest part is the south-west tower, erected by Edward I., and portions of the west and south sides built by James I. The next is the north-west corner, and original part of the north side, erected by James III. and IV.; the latter also built the east side, containing the Parliament-hall and original entrance. James V. is said to have erected, about 1535, a portion of the south side of the quadrangle, built up the principal entrance from the east, and formed that upon the south side of the palace. He also erected the entrance gate-house or porch to the outer court, about 1530. The panels above the gate contained the insignia of the Orders of the Garter, Thistle, St. Michael, and the Golden Fleece, conferred upon him by Henry VIII. of England, Francis I. of France, and Charles V. of Germany The north side, previously noticed, being much decayed, part of it fell in 1607. James VI., although residing in England, retained an interest in his ancestral palace, and had this side rebuilt between 1617 and 1628, from designs by Inigo Jones. The dates 1619-20 appear upon the interior front. King James also made extensive alterations upon the remainder of the Palace, adapting many of the older apartments to the present arrangements. The barbican outside the original east entrance has occasionally been considered to be a part of the castle erected by Edward I., but upon close examination it does not appear to be older than the date of the building adjoining, erected by James IV. The architects or masters of works engaged at the Palace from 1425 to 1467 appear from the accounts to have been John of Walton, Robert Wedale, Robert Livingstone, John Holms, John Weir, and Henry Livingstone. Sir James Hamilton was architect to James III. and IV., and Inigo Jones to James VI. Parliaments were held here in 1388, 1389, 1545, 1585, 1593, and in 1646, when Edinburgh was visited by the Plague.

On ascending to the first floor, the party traversed the several principal apartments. In the north-east corner is a large kitchen, with ante-rooms on the north and east sides. The former communicates with the large dining-room and private apartments behind, extending along the north side of the Palace. The other communicates with the Parliament Hall, which extends along the east side, measuring 98 ft. by 30 ft., with a gallery at at the north end, and large richly-carved stone corbels spaced along the side walls. This apartment, which is lofty, had an open-timber roof. Behind the south end of the hall is a retiring-room, robing-room, and strong-room; from these, extending along the south side, is the chapel, which contained a gallery at the west end, and is lighted by tall windows in the south side, with bold richly-carved stone corbels and canopies upon the intermediate piers. There are also some remains of the tile paving of the

floor. At the west end of the chapel are the hall and priest's chamber, communicating with a corridor towards the inner court. Along the west side is a large room, in which Mary Queen of Scots was born, with stairs from it leading to the apartments above and below. Adjoining the north end is a State council-chamber, James III.'s bedroom, strong-room, and oratory, terminating with beautifully ribbed groined ceilings. The council-room shows the plan of the complete paved floor, composed of tile and indented stone. The upper floors have been occupied as bedrooms and other private apartments. The top of the north-west corner stair is covered by an interesting groined roof, the ribs resting upon carved corbels, with the letters J and M intertwined, being the initials of James IV. and his Queen Margaret, daughter of Henry VII. Over this is a groined turret known as Queen Margaret's Bower, referred to by Sir Walter Scott in the fifth canto of "Marmion", as the place where Margaret retired after her husband had determined to advance to Flodden.

"His own Queen Margaret, who in Lithgow's bower,
All lonely sat, and wept the weary hour."

There is also a stone-paved flat forming part of the roof of the south side of the quadrangle, enclosed by the high sloped roofs at the back and ends, and communicating with the four corner stairs. The ground-floor is occupied at the south-east corner by several kitchens for the domestics and guard, also by a buttery and two guard-rooms. In the one at the entrance from the south the Regent Murray died, on the evening of the 23rd January, 1570, after being shot in the early part of the day by Hamilton of Bothwellhaugh. The south-west tower contains the prison, and the south-east a small stable for the king's horses. Adjoining the old east entrance is a dungeon, also said to have been occupied as a lions' den, but which may have ultimately been converted to another purpose. It is, however, curious to note that in the Lord Treasurer's accounts, there is a charge in 1330 for food to a lion belonging to David II. In 1452, there was a payment to a keeper of a lioness belonging to the king. In 1474, James III. got a present of a lion. There was a lions' den at Stirling Castle, a vaulted chamber in the Palace of Linlithgow, and a "house of the lions" at Holyrood in the time of Queen Mary. From the bottom of the stair at the north-west corner, there is a passage communicating with a door in the north front, leading to the archery-butts and boat-slip at the side of the loch. While viewing these and walking round the Palace, an opportunity was had of observing particularly the details of the masonry and stone-carving, which, except that upon the portion erected by Inigo Jones, shows both externally and inside the Palace a decidedly French character. The numerous chimney-pieces are of stone, of various designs, richly moulded and carved.

St. Michael's Church, adjoining, was next visited. It is still used as the parish church. Although an earlier chapel or church may have existed upon the site, the present building appears to belong to the fourteenth and fifteenth centuries, and is admitted to be an important specimen of an ancient parish church, being of large dimensions, and containing interesting peculiarities in its details. It has been a cross-church, with an octagonal termination to the chancel. The tower at the west end was surmounted by a crown, similar to that of St. Giles's, Edinburgh, which, from fear of its insecurity, was taken down about 1821. The beautiful west door and tracery of the windows are worthy of careful study; the tracery, which at first sight appears Flamboyant, is strictly Geometrical, and no design is repeated on the same side of the building.

Proceeding through a finely-wooded district to Binns House, the property of Sir Robert Dalzell, who kindly granted the necessary permission to inspect the apartments, the ancient family mansion appeared amidst groups of old trees upon the western grassy slope of Binns Hill. The oldest part of the building was erected in 1623, and by the additions made from time to time formed an irregular mass, which has been assimilated by alterations in the castellated style carried out early in the present century. The principal apartments, however, have not been much interfered with, and the panelled wall-linings, doors, and finishings remain, showing the variations in style belonging to the respective periods of the additions. There are also several beautiful plaster ceilings of different designs, converted, in some cases by single mouldings and in others by floriated bands, into geometrical forms interspersed by bold pendants. In one of the rooms a frieze is introduced, filled with fruit and foliage, which has a rich and pleasing effect. There are also some interesting specimens of ancient furniture in good preservation. The collection of family portraits, and others of the Royal family of Scotland, next claimed attention. It was said that some of these had been saved from the flames during the burning of Linlithgow Palace in 1746. When examining the portrait of General Dalzell, who was at the head of the army in Scotland in 1681, and the chief officer in raising the regiment of Scots Greys in that year, it was remarked that the visitors were upon the spot where the regiment was embodied while its two hundredth anniversary was being celebrated in London.

Leaving the pleasure-ground of Binns House, the party directed their attention to Abercorn Parish Church, still occupied as a place of worship. It belongs to the latter part of the Norman period, and is of an oblong form, measuring about 72 ft. in length by 15 ft. in width. The original division of the chancel and nave is shown by a plain-plastered arch, supporting a small bellcot outside the roof. Considerable alterations have been made upon the original church and buildings erected abutting upon its walls, yet there are some Norman features remaining, especially portions of two doorways, one with a zigzag moulded arched head, filled in by a slab with lozenge-shaped ornaments upon the surface. A thick surface of rough-cast over the exterior prevented any further details from being traced, but, in some places where it had fallen off, the ashlar of the original walling appeared. The earth had also accumulated to a considerable height upon the walls, which led to the suggestion that if it was judiciously removed, and the walls cleared of the roughcast and carefully pointed, the church would be rendered more comfortable, improved in its appearance, and would enable any of the old architectural features that may still remain to be readily traced. Notwithstanding these drawbacks, the church has a venerable appearance, surrounded by lofty old trees, laden with exuberant foliage. The interior, as already noticed, is of an oblong form; the pulpit, being placed about the middle of the side wall, has a deep recess in front of it. Although the paving is of plain pine, the pulpit enclosing the rail of the Kirk Session seat, and the finishings of the Hopetoun Gallery, are of oak. The panelling of the pulpit and canopy above are neatly executed. The inclosure of the Kirk Session seat may have been the remains of the altar-rail when the church was used as an episcopal place of worship. It consists of a large base with massive balusters, connected at the top by small arches, which support a broad moulded cope. There is some very effective carving upon the Hopetoun Gallery, which, with the fittings described, appear to belong to the seventeenth century. A peculiar arrangement is connected with the Hopetoun Gallery. There is an outer lobby, from which the gallery and a retiring-room enter; from the retiring-room there is a small well-lighted chamber with a fireplace and an opening in the church wall, through which the preacher may be seen and heard; an invalid or other occupant may thus join in the services without being exposed to draughts or other inconvenience. This may be said to be an elaboration of the earlier hagioscope. In the lobby there is also the shaft of an ancient Celtic cross, which was discovered in 1841 when removing an out-building attached to the church. It is now carefully cleaned and set up, and also suggests the course to be followed should any similar objects be discovered. In the churchyard there is a long gravestone of triangular section, with a longitudinal rising curve, turned up slightly at the ends, and finished upon the sides with rows of overlapping scales. Similar stones exist in other parts of Scotland, and also in England. They have been suggested to be of Scandinavian origin, but the form appears rather to have been suggested from the covering of the ancient bier, and which ultimately developed into the ridged Mediæval cope-stone.

The next place visited was Hopetoun House, which was occupied, but the party were kindly shown round the exterior. It is a magnificent palatial building in the Italian style, consisting of a centre and wings extending forward. The centre was erected about 1700 from a design by Sir William Bruce, the architect for the restoration of Holyrood Palace, and the wings were added in the end of last century from designs by William Adam, father of Robert Adam. The gardens are extensive and well arranged. On leaving, attention was directed to several large and interesting specimens of pine trees, and to the remains of the ancient castle of Abercorn, which was taken and demolished by James II. in 1455, during the Douglas wars.

After partaking of a substantial dinner at the Old Hawes Inn, in South Queensferry, the time remaining was devoted to a short visit to the Norman Parish Church of Dalmeny, of unknown date, but the name of the parson appears as a witness to a charter about the middle of the twelfth century. All then returned home highly gratified with the day's excursion and the admirable arrangements made by their President.

HAMMERWOOD CHURCH, EAST GRINSTEAD, SUSSEX.

THIS building is the church of a new parish, which has been formed, for the most part, from an outlying portion of the large parish of East Grinstead, from which it is fully four miles distant. It stands on high ground, and is a very conspicuous object in this still well-wooded district.

The name "Hammerwood" is derived from one of the old iron forges which were once so prevalent in the Weald of Sussex, and the stream in the valley below the church still retains the dam and mill-stream which doubtless once did duty for driving the forge. This water has long since been formed into an ornamental adjunct to the adjacent mansion.

The church, which is in the English flowing Gothic style of the middle of the fourteenth century (the Decorated), consists of an open nave, divided from the south aisle by a range of arches with circular columns and carved capitals. The chancel opens from the church by an ornamental arch of its whole width. The tower, with spire, is at the east end of the south aisle, and opens into the chancel and aisle by two corresponding arches. The vestry is on the north side of the chancel, and there are two porches north and south of the church.

The whole of the roofs are of open timbering, with arched principals; the seats are of open oak framing, and oak has been freely used for the fittings generally. The passages are paved with tiles, and the windows are filled in with ornamental glazing, by Mr. Brunton, of Kennington. The roofs are covered externally with Broseley tiles. There is a peal of five bells in the tower, which were supplied by Messrs. Warner, of Cripplegate.

The carving has been done by Mr. Davis, and the heating apparatus by Messrs. Berry, of Pimlico. The contract for the erection of the building has been successfully carried out by Messrs. Nightingale (builders), of Reigate, from the design and under the superintendence of the architect, Mr. E. P. Loftus Brock, F.S.A., of Montague-place, Russell-square.

The church has been erected by Mr. Oswald A. Smith, of Hammerwood Lodge and Lombard-street, who has defrayed the whole cost of the building, besides giving the site.

The large east and west windows are filled in with stained glass, by Messrs. Clayton & Bell.

The length of the building from east to west is 78 ft. The spire is 100 ft. high.

The churchyard is enclosed by a stone wall, and is entered by a lych-gate of massive oak work.

DECORATIVE DESIGNS.

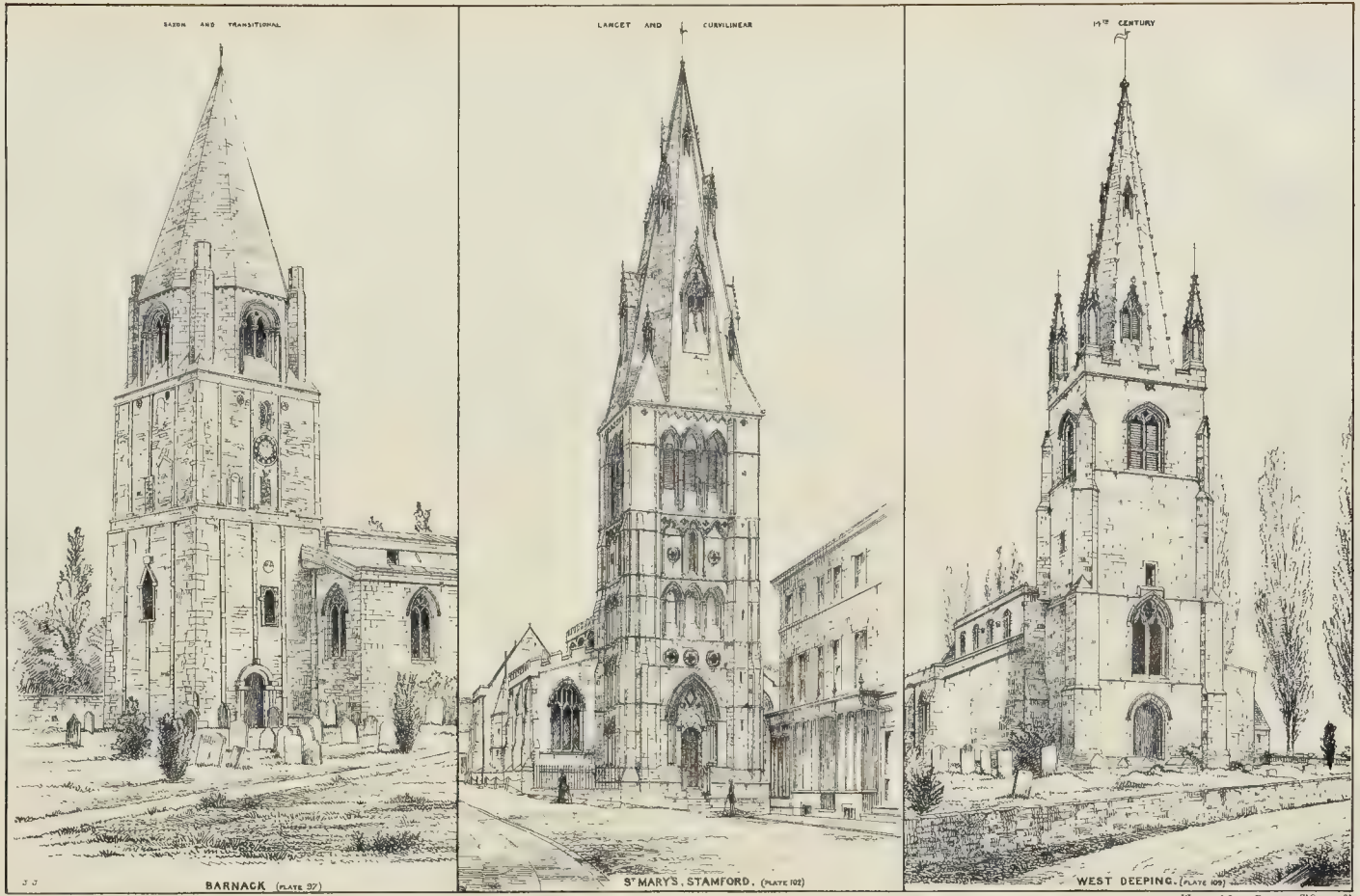
THE accompanying design by Mr. Geo. C. Haite for wall-paper is the first of a practical series, illustrating various decorative arts and art-manufactures, which will appear from time to time in the *Builder*. The drawings will be reduced by photo-lithography. All the examples given will be strictly original and of a thoroughly practical kind, especially adapted to the purpose for which they are intended.

The departments it is hoped to illustrate will include wall decoration in its diverse forms, as paper, leather, wood, fabrics, matting, tiles and terra-cotta; ceiling decoration in flat and relief, stencilling and painting; the decoration of furniture, as painting and inlay carving; the treatment of floors in parquetry, wood, tiles, fabrics, linoleum, together with suggestive designs suitable for iron, brass, stone, glass, and other materials.



Whiteman & Bass *Photo Litho* Wyman & Sons, Printers

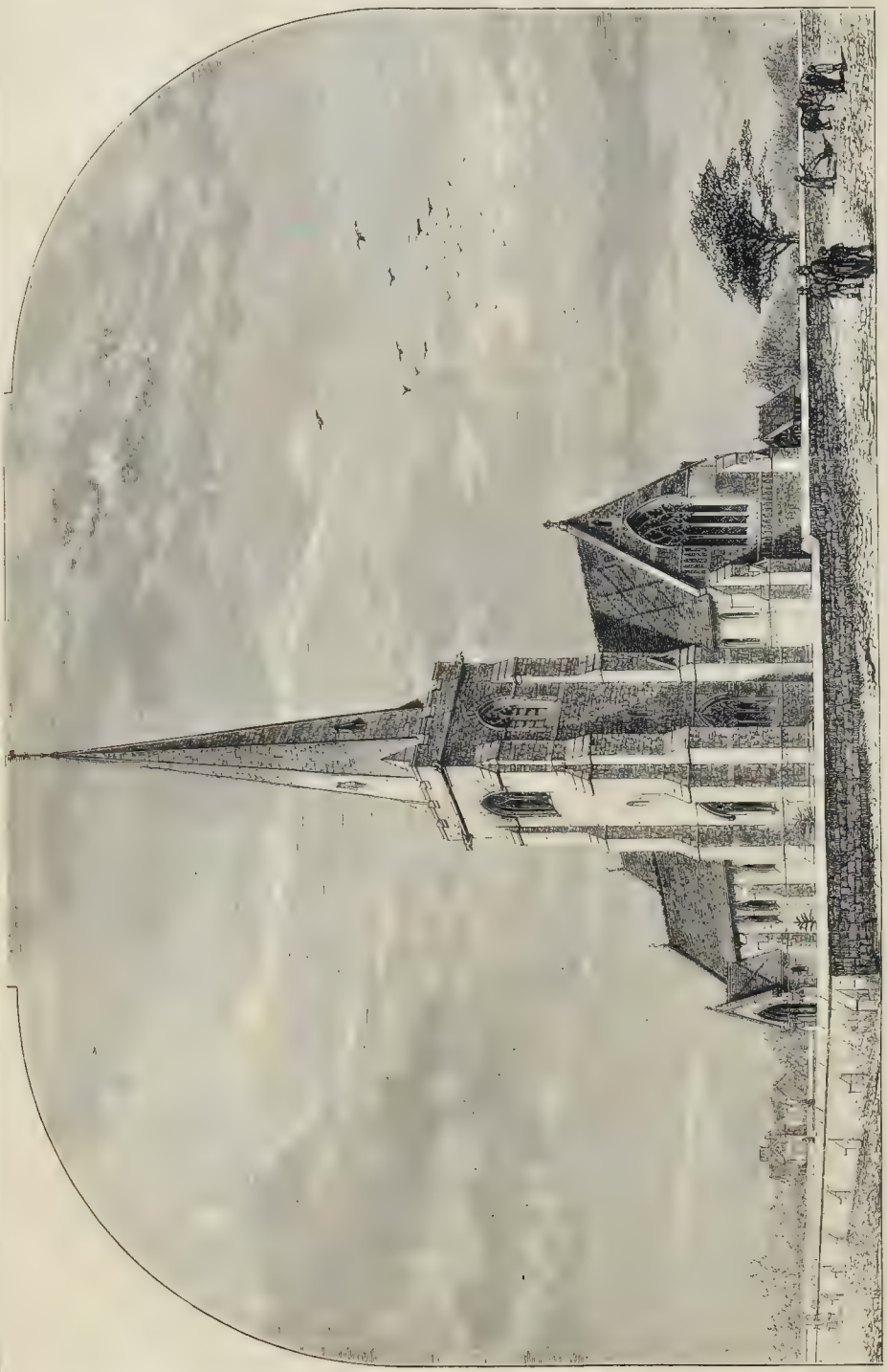
WALL PAPER.—By George Chas. Haite.



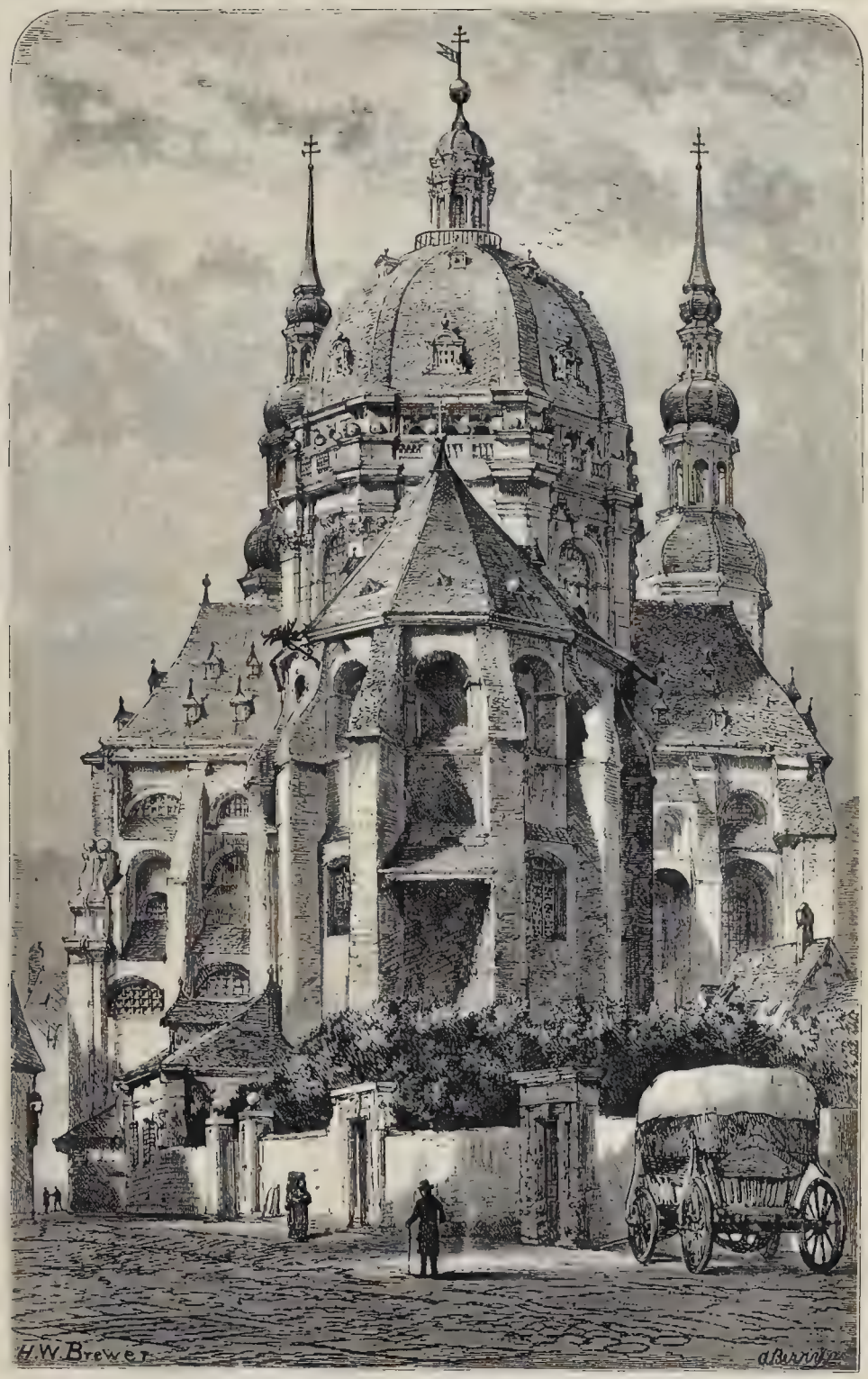
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Wyman & Sons, Printers G^t Queen S^t

TOWERS AND SPIRES IN AND NEAR STAMFORD.



HAMMERWOOD CHURCH, EAST GRINSTEAD, SUSSEX.—MR. E. P. LOFTUS BROCK, F.S.A., ARCHITECT.



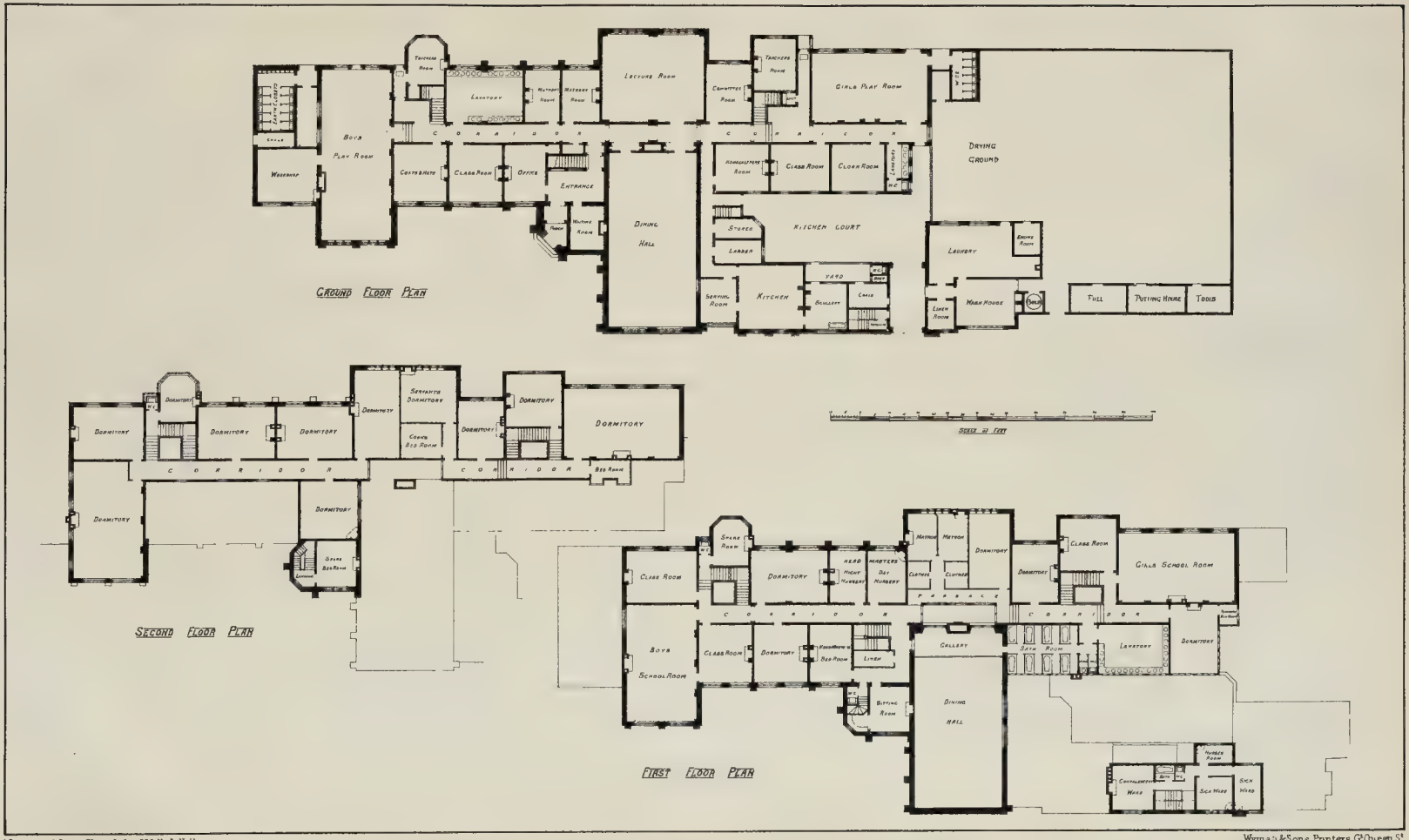
CHURCH OF THE "STIFT HAUG," WÜRZBURG: SEVENTEENTH CENTURY.



Whiteman & Bass *Photo Lith.* 236 High Holborn

Wyman & Sons Printers 74 Queen St

NEW SCHOOLS, SAFFRON WALDEN.—Mr. Edward Burgess, Architect.



Whiteman & Bass, *Photo-Litho* 236, High Holborn

NEW SCHOOLS AT SAFFRON WALDEN, FOR THE SOCIETY OF FRIENDS.

Wyman & Sons, Printers, Gt Queen St

Such a series will, we believe, supply a want. Patterns already executed and shown as such are of little or no value to manufacturers and professional men who respect *meum et tuum*. Moreover, manufacturers themselves, as a rule, object to the publication of their patterns, since it lays them open to the safe attack of plagiarists and to a certain extent encourages the production of inferior and cheaper imitations, which are thrown upon the market to the detriment of the better class of goods.

The designer will in each case endeavour to explain in a concise form the scheme of colour, the manner of production, and his reasons for the construction and selection of the design whenever it may be necessary.

A WALL PAPER.

This design is intended for the decoration of wall space, and repeats in 21 in. by 21 in., and drops in the hanging, the necessity for which will be at once apparent. The subjects selected are the common nut and sloe, and from their treatment rely almost entirely upon colour for effect; therefore it loses considerably in reproduction in single colour. The scheme of colour is more elaborate than is generally advocated for printed papers, numbering, as it does, in all six colours; but in this pattern, if they are kept well together, the soft and rich glow produced by their means will not at all lessen its decorative value.

The following arrangement of colour is suggested:—Divided into oblong squares of two shades of a well-broken yellow, the darker falling behind the nut, which the designer has endeavoured to convey by dots; one quiet green series for the leafage, a sufficient difference appearing in the nut leaf where the veining is more open; a pale greenish white for nut; dull bluish purple for the sloe; the stems and nut husk in citron; the whole being brought together by an outline of dull brown, which serves for the veining also.

CHURCHES IN AND NEAR STAMFORD.

WE noticed at length in our last number (vol. xl., p. 783) the recently-published book which deals in a very good way with the "Churches of the Nene Valley" (Batsford, 52, High Holborn, 1880), and of a district a little to the north of it. A promise was made that three of the perspective views should be reduced by photo-lithography so as to make up a page illustration for the *Builder*. The perspective views in the book are in number about one-sixth of the 112,—the whole number of the plates,—and are slightly out of the way of the main purpose of the volume, which was to concern itself with the interiors of buildings and with details, rather than with outside and general effect. A few illustrations of exteriors, however, find their place naturally enough,—since they also show what changes in expression and in details were being made between a period well before the Norman Conquest, and the middle of the fifteenth century. The original lithographed illustrations are very fair specimens of transfer lithography. They have been reduced for us to about half their original size in every direction, but still show good draughtsmanship and a light firm touch. The three examples have been selected as being fairly characteristic in their way. Although the intervals between the dates of the work are not even, there is a fair representation of several of the stages between the primitive Romanesque of the very early tower of Barnack and the late Curvilinear work at West Deeping. Of work belonging to intermediate dates, for instance, is the octagon belfry-stage and short stone spire, belonging to the latter half of the twelfth century, put upon and cleverly designed to suit the rude square early tower of Barnack. This view (plate 97) and that of the still more characteristic tower of Earl's Barton (plate 96), will give the possessors of this volume a very good idea of the work which our rude forefathers contrived to erect amid all their difficulties. The west tower and spire of St. Mary's, Stamford, take very high rank among the many west towers and spires of a good stamp scattered liberally over England. The tower is by no means the distinctive fifteenth-century Stamford tower,—appearing at St. John's, St. Martin's, and All Saints',—which will be found carefully described in vol. xxxvii. (1879) of the *Builder* (pp. 692, 693). St. John's is given in the "Nene Valley" book (plate 112). That treatment of the towers came into vogue long after the completion of St. Mary's spire. This spire fits the substructure very well in scale and extent of elaboration; but the tower is much pierced from the base upwards, and the spire has imposed a difficult task upon it for more than 500 years. The extra weight has not been at all easily borne, and buildings-up of windows and arches, iron bands and ties, &c., have been pretty freely indulged in. Through the "wisdom of our ancestors," in the days sighed after as those of rare constructive skill and of honest building, plenty of these little tasks have fallen to the lot of us poor worshippers of the past in these degenerate days.

NEW SCHOOLS, SAFFRON WALDEN.

THE schools we here illustrate by view and plan have been recently erected from the designs and under the superintendence of Mr. Edward Burgess, architect. The building will accommodate 200 children.

The materials used are red brick, with terra-cotta dressings; and tiles on the roofs.

The builders were Messrs. Bell & Sons, of Saffron Walden.

THE CHURCH OF THE "STIFT HAUG," WÜRZBURG.

As we have more than once pointed out, although the Renaissance style was introduced into Germany at the end of the fifteenth century,* yet it was two centuries before it came into anything like general use in the construction of churches. The earlier ecclesiastical edifices erected in this style in Germany are, as a rule, very dignified, and rather severe in character, and possess considerably more picturesqueness of treatment than those of Italy or France. The high-pitched roof and projecting external buttresses of the Gothic are still retained in combination with regular Italian domes and façades. The curious bulb-shaped spire, consisting of a series of lanterns superimposed, and each crowned by an onion-shaped dome, is a remarkable feature of these buildings, and although it may be objected that these spires are unconstructional and eccentric, there can be no doubt that they have a remarkably picturesque appearance, especially when seen in combination with other buildings.

The Church of the "Stift Haug," at Würzburg, is an interesting example of this style, and exhibits all the peculiarities of that particular phase of architecture which we have been describing. The name "Stift Haug" really means "the Establishment of Haug," and is the designation given to a college of priests, of which this was the church. The church itself is dedicated to St. John the Baptist, and was erected between the years 1670 and 1683, under an architect named Petrini, a native of Würzburg, who erected many buildings in that town. The name Petrini certainly has a very Italian sound about it, but Italian names are so common in Würzburg, even at the present day, that it is probable that an Italian colony was established here some centuries back.

The Church of the Stift Haug consists of a single choir, terminating in a polygonal apse to the east; transepts; and a nave of three bays, with chapels instead of aisles. A finely-proportioned dome rises over the intersection, and two lofty towers, crowned by bulb-shaped spires, flank the western façade.

The interior of the building is simple and dignified, and the altars and furniture are in better taste than is usual with buildings of this date, while the organ is really a fine piece of design. The pendentives of the domes rest upon a series of pilasters rather singularly treated.

The church is built of a fine warm sandstone, except some of the plainer portions of the walls, which are of rubble covered with plaster. The apse has rather a Romanesque character about it, and were it not that there is positive evidence to the contrary, one would be led to suppose that remains of an earlier church had been worked into the existing building.

The architect Petrini also erected the magnificent tower of the University Church, the "Julius Hospital," the city gates, and a portion of the castle at Würzburg. All his works have a fine picturesque outline, and the detail is bold and effective, though rather coarse.

* The "Coronation Hall" in the Hradschin at Prague, which dates from the years 1470–1520, is said to be the earliest building exhibiting Renaissance detail in Germany.

ARTISANS' DWELLINGS IN LARGE TOWNS.

FROM A NURSE'S POINT OF VIEW.*

ANY one who knows anything of the condition of the working-classes in the back streets and slums of London and other large cities, does not require to be told that rules of nursing in their entirety cannot be carried out. It is impossible to choose a quiet room with the aspect you would most desire for an invalid, for there is only the one living-room for father, mother, and four or five children. The walls are neither painted nor whitewashed, but "covered with a dirty cheap paper, pasted over innumerable other papers, harbouring loathsome insects," so that on summer nights the poor are often driven from their feverish unrest to seek relief in the streets and sit on the doorsteps, or propped against the wall of the houses until sleep and fatigue again drive them in. The ceilings are only whitewashed at long intervals of years. The grate is what used to be termed a "bed-room grate," one of the most useless for cooking purposes. The window,—there are rarely two,—does not open at the top, or else it opens without a sash-line, so that it must run down to the wooden support when open, or be closed. There are no means of heating water, except by the kettle, which then takes the whole of the fire; no oven for warming or baking any invalid's luxury; no place to keep milk without its turning sour; no water supply,—except the one water-butt, tap, or pump in the cellar or yard, which has to supply for drinking and all other purposes all the lodgers in the house. And it is a common thing in Holborn parishes for one house to contain ten families and between thirty and forty children. All water for cooking, drinking, and cleaning has to be carried up many flights of stairs in vessels so unfitted for the purpose,—a gallon jar with small bottle-neck is the most common,—that the poor practise a more rigid economy with water than can be understood by those who have not themselves gone through the labour of bringing it up, and of carrying the dirty water down, many times in one day. So you will see the hands and faces of the children washed in the same water, and the same soiled water reserved for washing the floor afterwards,—when that operation is gone through.

If this Domestic Economy Congress can carry out all the good they have at heart, we may hope that in the next century tenants will not be found for such lodgings. But in the present day, as has been well said, "working men cannot build their own houses, but must use those that are available. . . . The result being that they are driven into over-crowded courts and ruined tenements," where ventilation and cleanliness, in a nurse's sense, are almost unknown.

The books on Domestic Economy used in schools, that I have seen, are all more or less admirable in their remarks on "nursing the sick," as they are taken from Miss Nightingale's "Notes on Nursing." They give advice on the choice of a sick-room, quiet, pure air, cleanliness, warmth, rest, diet, light, and cheerfulness. Short directions are also given with regard to food, drink, disinfecting, and the qualities necessary in a good nurse. But in none of these books, nor in the schools where they are used, has it been thought necessary to teach nursing like cooking, by demonstration and practice lessons. But we have to remember that children leave school at thirteen, and that a large proportion of them go out to "a little place," where there is no chance of their ever being trained in the service of cleaning "a sick room" and furniture, and of making the bed and changing the linen of a helpless patient.

I would suggest that if nursing is to be one of the subjects for examination according to the New Code, the art of nursing and of keeping a patient clean and free from bed-sores should be taught to the children first by demonstration, and then by practice lessons. I have myself taught quite young children to change the linen, and make the beds of helpless patients,—each child taking it in turns to be the patient, and doing her best to be in such a "helpless condition" that the two children acting as nurses might not have too easy a task in "changing her," as the removal of one set of bed and personal linen for another is termed. In the same way, I and the ladies working under me, as trained nurses

* A paper by Mrs. Dacre Craven, read by her at the Domestic Economy Congress, Royal Albert Hall, on the 23rd ult.

for the sick poor, have taught children how to use certain appliances for the sick, how to clean a carpet,—if too large to admit of removal,—without dust or noise, by means of a wet cloth, twisted round the brush, or itself made into one; how to clean the hearth, to lay and light a fire; and, to older children, how to wash a patient from head to foot, between blankets or their substitute, without once uncovering any part of the body, and without any unnecessary amount of water. But if, as an old nurse who has given the best part of her life to learning her profession, I may be allowed to give an opinion, I do not think that lectures or books can ever give this teaching.

Again, with regard to ventilation, it must be remembered that the artisan class in London is a moving body. Every clergyman will tell you of the difficulty he has to encounter from his parishioners constantly moving from one district or parish to another. It is, therefore, useless to recommend ventilating valves, &c., which could not without too great expense be removed from one lodging to another. The only ventilation practicable for the working-classes in lodgings is natural ventilation,—that is, ventilation caused by the ascent of heated air and the descent of cold. Architects, as a rule, made no provision in former days,—they rarely do now!—for the air which is to feed the chimney. An ordinary fire, as you all know, draws about 150 cubic feet of air per minute, and in the absence of any provision for the admission of air, and with the window shut, the supply of air must come from irregular sources, viz., from window chinks, through the keyhole and crevices in the door-stead, skirting-boards, and floor-boards,—these irregular streams of cold air passing for the most part horizontally towards the fire, and chilling the occupants of the room not in bed. The more furnace-like the fire the stronger the cold draught, but a very moderate opening in the window will stop all irregular draughts, the air taking the easiest course. By holding a candle at the keyhole of a door you can test whether sufficient air is admitted by the window; for, if so, the flame will burn in repose, and the horizontal draught can be converted into a vertical one by a board or cloth, 6 in. or 8 in. high, fixed about 2 in. from the window.* I think children might be taught this, and also the Canadian system of ventilation, where windows will not open at the top, of opening the lower sash and filling up the space (temporarily) with a folded towel or cloth, until a piece of wood could be made to fit well in under the lower sash, thus allowing a supply of air to come in between the two sashes without causing a draught or strong current of air to blow down upon any one near the window. They should also be taught that it will keep a room fresher and cooler, even in hot weather, to have a very small fire burning in the grate, or a lamp, so as to keep the air from stagnating by making a current of air towards the chimney. They could be taught by demonstration how to make "outside blinds" with the common window-blind, two sticks, and some tapes, so that cooled air could enter the hot rooms in crowded courts and alleys. We have found the sick most grateful for this in St. Giles's and Holborn.

Children might also be taught how to "ice milk," soda water, or any cooling drink for the sick, by wrapping the vessel containing it in a wet flannel and standing it in the sun; how to filter the foulest water by means of a common flower-pot with a piece of sponge in the hole at the bottom and two inches of charcoal over it, and then two inches of clean sand,—the pot to be placed over whatever vessel is to contain the water when filtered; how to wash and dress a baby—by means of a china doll; and how to give a warm bath to a child with croup. In the books of instruction, it is always said "Give a warm bath immediately," but in not one instance are instructions given that no baby or child should be put into a bath which is too warm for your bared elbow to feel comfortable! nor how, when the child is in the bath, boiling water may be gradually added by keeping the water in the bath always moving with one hand until its temperature has been raised to over 100° without the slightest pain or inconvenience to the child.† Children might further be taught that on coming out of such a bath, a warmed blanket should be thrown round the baby; that he should be put to bed and covered with extra blankets to encourage free perspiration, for an hour at the least, and then thoroughly dried and dressed as usual for bed. All children, moreover, ought to be instructed practically how to drop oil into the ear to get things out; and, theoretically, such simple things as bathing the eyes with vinegar to nullify the effects of quick lime, and so preserve sight, which would be lost before surgical aid could be found. But to teach children how to diagnose diseases and how to treat them, is to multiply the already large number of women who think that "quack doctoring" is nursing.

In conclusion, I would again urge that nursing, like cookery and cutting-out in needlework, should be taught practically, and that means should be devised for giving special instruction in these subjects to elder girls in night-schools.

* Mr. F. Hinckes Bird, on "Costless Ventilation," *Builder*, 1862; Mr. T. Pridgin Teale, on "Dangers to Health," 1878.

† I know of two instances, one quite recently, where children have been scalded to death from ignorance of "how to give a hot bath."

AN ITALIAN EXPORTER.

AT the banquet given last month to the exhibitors in the National Exhibition in Milan, the one who claimed most attention was he who, as the Syndic Berlinzahi termed him, was "the typical man of modern times,"—he who should be the model and beacon of national labour for exportation, — the Commendatore Francesco Cirio, of Turin.

At the Exhibition of Milan he is to be found as the exhibitor of preserved food of all kinds, shown in a monster pavilion, with two others adjacent, of all kinds of milk produce and eggs. Then in the gallery where all comestibles are found,—in the department of materials for building purposes, among the machinery, and even among railway works, with his refrigerator wagon, after the American Teffney system, corrected and perfected to meet the especial exigencies of exportation from Italy of alimentary merchandise.

This extraordinary commercial enterprise of exporting alimentary productions from Italy is not more than ten years old. Signor Cirio was before 1869 an *employé* on the North Italian Railway, and is by birth a Piedmontese,—the people of Italy who possess the quality of perseverance and industry in the highest degree. In December, 1869, Cirio sent off from Naples his first large wagonful of cauliflowers,—the first time any exportation of Italian vegetables had ever crossed the Italian frontier; in 1870, a few wagon-loads of vegetables; in 1871, sixty wagon-loads, containing, 3,655 quintals, exclusively of vegetables; in 1880, 4,519, with a load of 386,903 quintals. The medium of the load of each wagon in 1871 was six tons; in 1880, nine tons.

From 1870, Cirio had carried out all his plans alone, uninterrupted by any opposition; but by 1880 he had to battle against all the opposition and hostilities always attending successful speculations; but to his own personal activity, perseverance, and indomitable courage is he indebted for the grand success attending all his operations. Every fourth year a new impulse and development of his plan were seen. In 1871-72 he confined himself to the exporting of vegetables to Austria, Hungary, and Russia. In 1873-74 he began exporting fruits, first in small proportions (twenty-five wagons in all), not only to the above countries, but to Holland, Belgium, and England. In 1876 he undertook to export eggs and butter; and from 631 wagons sent in 1875, he, in 1876, reached the number of 1,188, with a load of 18,000 tons weight. In 1877 he began to send to France, beginning with the exportation of fresh fish, especially trout, taken from the Italian lakes. The price of the lake trout quadrupled, and many, following his example, drove flourishing trades in fish exportation.

Independently of these operations, the expediting of butter and cheese from Lombardy, &c., was carried on with great vigour. In this several influential men from Verona and other places joined him, forming a large company. At the commencement the introducing Italian eggs into the English markets met with great opposition; but by degrees the difficulties were overcome, and now one house alone in London employs 120 horses to distribute Italian eggs in the various parts of the metropolis.

By the exporting of eggs, fowls, and pigeons, Cirio has given an impulse to a modern branch of domestic industry, the development of fowl culture, by which the small farmer can benefit greatly, and secure therefrom a moderate annuity. The cultivation of vegetables and improvement also has been stimulated, and he himself has, at great expense and against great opposition, possessed himself of lands where he has given example of the possibility of improving the vegetables and fruit by introducing all the modern suggestions and means used by other countries.

Another of the branches of commerce undertaken by Cirio & Co. is the preserving of fruits and vegetables, which is carried on to a perfection hitherto unknown. For the preserving of fruit Cirio has set up an immense establishment at Turin, where, besides vegetables and fruit, fowls in jelly, and, above all, the truffles, are famed for the preservation of their exquisite taste.

In Rome, Cirio has formed a company for exporting Roman cement, and by means known to himself, he has been able to export ten tons of cement in a form that when required for use, by mixing it with nine parts more of common sand, the same effect is produced as by the pure Roman cement, thus saving the expenditure of carriage.

SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS.

THE fourth annual meeting of this Society was held on Friday, the 24th ult., at the Westminster Palace Hotel, his Excellency the Hon. J. Russell Lowell, the American Minister, in the chair. There was a large attendance.

Mr. Newman Marks, the secretary, said that letters expressive of inability to attend the meeting had been received from (amongst many others) Mr. James Parker, the Marquis of Salisbury, Professor Robertson Smith, Sir John Lubbock, Mr. Alma Tadema, R.A., Mr. H. Stacey Marks, R.A., the Rev. Canon Greenwell, Dr. Birdwood (of the India Office), and Mr. Samuel Huggins. Mr. Huggins wrote:—

"I am pleased to find that the United States, by her Minister, is to take so prominent a part in the proceedings, which will have a good effect on the British mind, as it tells a tale of the association, in the American mind, of 'Fatherland' with ancient edifices, which I believe is general among the cultivated classes. I remember the bitter disappointment always manifested, as I was credibly informed, by American visitors to Chester during the restoration of the cathedral, and their invariable charge to the *cicerone*, 'Don't let them touch the cloisters!' (the feature of the cathedral generally considered the most beautiful)."

The Chairman, in opening the proceedings, said it was not an English characteristic to shift the burden of responsibility upon other shoulders, nor had that been the method by which the English race had achieved such an eminence,—he was almost going to say pre-eminence, — in the world. He had almost imagined, however, that some such desire had manifested itself when he was asked to preside over a meeting for the conservation of ancient buildings,—and primarily, he supposed, for the conservation of ancient buildings in England. If that had happened in an age when inanimate things still possessed the gift of speech,—in an age when Imagination still sat by every chimney-corner and played a leading part in the tragi-comedy of life,—he should have expected to hear addressed to him words something like these proceeding from the walls of the old buildings,—"What have *you* to do with *us*?—*You*, a man of the New World,—a child of Yesterday, even though you flatter yourself that you are going to be the father of To-morrow,—you, who congratulate yourself on having cast off the burden of Antiquity, and on having liberated yourself from the mortmain of the Past,—what have you to do with us?" His venerable friend, in thus appealing to him, would recall to his mind a little adventure he once met with while walking out of Boston, in New England. The road was covered with ice and snow, and a little boy had fallen down, and began to cry. He went forward to commiserate with the child, who, as soon as he heard his voice, said, suppressing his tears, "Well, and if I am hurt, it is not any of your business!" He confessed that seemed to be a thoroughly English answer,—an answer quite characteristic of a race of people who set a higher value upon an ounce of pluck than upon a hundredweight of sentiment; but at the same time it showed that in whatever else a people changed if they went beyond the sea, they did not change their blood, still less did they change in those mysterious influences drawn from a remote source which kept alive the characteristics of race. He felt that the little Boston boy of whom he had spoken, and

millions of others like him, had a claim to their share of the achievements of the English race, and accordingly he did not feel that he was out of place in presiding over the meeting. Strong as were the ties of blood and language, those of tradition were still stronger. Americans and all other English-speaking peoples looked upon England not only as their metropolis in the old sense of the word, but they looked upon it as their muniment-room, where were preserved the archives of the race,—whether on parchment or paper, or whether recorded in stone. The ancient buildings of England were as much the archives of the Americans and of the whole English-speaking race as they were those of England herself, and he was proud to be able to say that a countryman of his had so thoroughly studied those archives as to have become the best archæologist and genealogist now in England: he referred, of course, to Colonel Chester, on whom he was glad to see that the University of Oxford had just conferred honour. America had contributed directly on more than one occasion towards the conservation of English monuments, and on other occasions she had contributed indirectly to the same end. As an instance of such indirect contributions he referred to the case of the house in which Shakspeare was supposed to have been born, and as to which nothing but the fear that the enterprising Mr. Barnum would purchase the house and remove it to America terrified the English people into subscribing 3,000*l.* for the purchase of the house and its preservation. The American people had naturally a very direct interest in the question of the protection and preservation of the ancient buildings of England, and if they were not themselves distinguished for their beautiful monuments, that was all the more reason why they should devote all their energies to the preservation of beautiful monuments that had been built by other people. They protested against the restoration of old buildings because the hand of the restorer was far more destructive than that of decay. He was not sure that he could go so far as those enthusiasts who would rather that an ancient building should tumble down and become a mass of ruins than allow anything to be done to preserve it. But it was possible to keep a true mean course between effacing restoration on the one hand, and destructive neglect on the other. The title of the society was, he thought, exceedingly well chosen as expressive of its objects, and those who supported it and carried it on had the sympathy and moral support (and he thought, if need be, they might count upon the material help) of every cultivated man on the other side of the water. It afforded him great pleasure to preside over the meeting and to do anything he could to forward its objects.

Mr. William Morris then read the fourth annual report of the committee, which commences with the following paragraph:—

"The Committee have been steadily at work at the business of the Society since we last met together; they do not doubt that its principles are being more and more accepted; but the fact must be faced, that ignorance and thoughtlessness are so busy, and are so entirely unchecked by any more direct influence than that opinion of cultivated men of which they know little or for which they care little, that the destruction of the art and history of our ancient monuments is still going on with terrible swiftness, both in this country and elsewhere; and unless those who really care about the preservation of these treasures bestir themselves, and sacrifice some time and money to furthering a distinct agitation against restoration, it will not be long before there will be no ancient building which can be looked on by men of sense and knowledge without suspicion and discomfort; and very few which will be able to sustain a claim to be considered as ancient buildings at all. The very list of those buildings for whose protection the Society has interfered shows how swift the destruction is that is going on at one end of the line, while we are laboriously building up a public opinion at the other end."

The report went on to describe in detail the action which had been taken by the committee with regard to the proposed restoration or destruction of ancient structures. Reference was made to the proposed widening of Magdalen Bridge, Oxford,—a step which the committee assert to be wholly unnecessary as well as destructive of the beauty of the bridge; to the fall of the tower of St. John's Church, Chester, owing to "the neglect of the advice given by the committee" in reference to the building; to Wimborne Minster, Ashburnham House, and other buildings, some of them in Italy.

The Hon. Percy Wyndham, M.P., moved the adoption of the report.

Mr. Reginald Stuart Poole, in seconding the motion, urged the Society to make strenuous efforts to save the Arab monuments of Egypt from destruction. Those beautiful monuments were now being most cruelly despoiled. He was quite sure that Professor Maspero, who had succeeded the illustrious Mariette,—too soon taken from us,—would be most ready to receive the co-operation of Englishmen and Americans in saving the priceless Egyptian and Arab monuments under his jurisdiction. The Egyptian monuments were really documents of priceless value, and only now were they beginning to be understood. Very frequently the damage that was wrought by tourists and others rendered meaningless, and caused to be lost for ever, inscriptions possibly of the highest historical value. In the Arab monuments, on the other hand, was to be seen a sequence in the development of the style corresponding to the progressive changes in Gothic work. This art had never been properly studied, but it was capable of teaching us some valuable lessons in the way of decorative work.

Miss Amelia B. Edwards, in supporting the motion, described the destruction going on amongst the monuments of Egypt, not only at the hands of the *fellah* and the tourist, but at the hands of the *savant*. An army of destructive agents, moved by cupidity, by curiosity, by the mere spirit of mischief, and aided and abetted by a spirit of lazy utilitarianism, was doing its best to make a *tabula rasa* of the history of Egypt as contained in the monuments of the country. The pyramids were being used as quarries, and the paintings on the interior of the tombs were being damaged by the smoke and grease from the bunches of candles which were used as torches by the tourists,—who were the most destructive agents of all, many of them carving their names or initials with the view of going down to posterity in company with Rameses the Great and Thothmes III., or possibly, as a great authority had said, in order to show that a fool once passed that way, and did what mischief he could. Miss Edwards went on to urge that serious representations should be made to the Khédive with the view of securing better protection to the monuments of Egypt. The Khédive and his Ministers were very jealous of the good opinion of Europe, and it would not, she thought, be in vain if some serious remonstrance were made against the continuance of the destructive work that was now going on. She was sure that Professor Maspero would be glad to have his hands strengthened in the matter. He was very desirous of being able to effectually interpose against the Vandalism now going on. He would probably pay a visit to this country in August next, and it would, perhaps, be possible for the society to confer with him on the subject.

Professor Sheldon Amos also supported the motion, and confirmed the statements made by Mr. Stuart Poole and Miss Edwards as to the destruction now going on in Egypt.

The motion was unanimously adopted.

Mr. George Howard, M.P., moved the following resolution:—

"That this meeting, while strongly deprecating the practice of so-called restoration, feels deeply the necessity of urging on all guardians of ancient buildings the duty of keeping them in good and substantial repair, a duty which this Society has on so many occasions striven to put before them."

He said that while sympathising with all that had been said as to the monuments of foreign countries, it should not be forgotten that the society had an important duty to fulfil in this country. He lamented that the clergy, the universities, and the architects were against them, but it was their duty to press on the work they had undertaken, and not to be disheartened at only partial success so far.

Mr. C. Kegan Paul, in seconding the motion, said he hoped the society would keep its eye on Wimborne Minster, which had already suffered seriously by restoration.

Mr. William Morris supported the motion, and spoke with regret of the havoc that had been made by Balliol and other colleges in destroying ancient buildings in Oxford. After speaking in strong terms of the proposed modernisation of Magdalen Bridge, he concluded by complaining that the society was not so well supported pecuniarily, even by its professed friends, as he thought it should be, considering the importance and extent of its work.

The motion was adopted.

Lord Houghton, in moving a vote of thanks to the chairman, said he could not but feel that there was something touching in the circumstance of that meeting being presided over by a distinguished citizen of that great country against which the only thing that could be said was that it was not very old. He had heard Americans speak of the old Walls of Chester as almost revealing to them portions of the old story of Biblical history. Chester was the first walled town that they ever saw, and by its means they were able to realise more vividly than would otherwise be possible the Biblical stories of their childhood. He was sure that any injury to the Walls of Chester would be viewed as a national calamity in America. With regard to the general objects of the society, one reason, perhaps, why they were not better understood and why they evoked criticism, was that in many old buildings it was almost impossible to draw exactly the line of preservation so as to prevent decay, and, at the same time, to preserve to the building the totality of its interest. In conclusion, his lordship urged the formation of local committees or societies in connexion with the society.

The motion was seconded by the Hon. R. C. Grosvenor, and carried with much applause.

Mr. Russell Lowell, in acknowledging the compliment, said that, however much the political divisions of race might be separated, the historic continuity of the race would be maintained by the existence of its monuments. He considered no monument insignificant; none could be, because it might have some feature or some special circumstance connected with it, making it, as it were, a round of the ladder by which we could climb back to our historic past. The society was engaged in the performance of the office of a watch-dog, and it was of much less importance to know into how many calves the dog set his teeth, than that it should be known that there was a watch-dog on the premises.

SANITARY PLUMBING.

TRAPS AND TRAP VENTILATION (CONTINUED).

MR. HELLYER delivered the fourth* of the course of six lectures to working plumbers, undertaken by him under the auspices of the National Health Society, on Tuesday evening last, in the Hall of the Society of Arts. Mr. Noble Smith presided, and there seemed to be no abatement of the interest taken by the large audience in the lectures. The one now reported was illustrated by a large number of diagrams, and by practical experiments with traps of different forms made of glass so as to show whether they were or were not self-cleansing, and whether or not, under given conditions, they could be syphoned out. The lecturer was frequently stopped by questions which, while interrupting the course of his remarks, at any rate showed that the plumbers composing the audience were brimming over with a desire to learn, if not to criticise. The feeling seems to gain ground that an evening or two should be set apart for discussion of the subject at the close of the course of lectures.

Mr. Hellyer, in commencing his lecture, said that on that evening he ought, according to the programme laid down, to be entering on the discussion of the subject of "Soil-pipes and Waste-pipes," but he had been unable, in his last lecture, to exhaust the subject of traps. He had already considered the D-traps and bell-traps,—the two characteristic non-cleansing traps. There were many other traps which befouled themselves in use, but he only wished to speak of traps of that class which were used outside buildings, *i.e.*, in connexion with drains,—before passing on to consider self-cleansing traps. Some might think that such traps were outside of his subject, but in his opinion the plumber's knowledge ought to cover the whole area of house drainage, and ought certainly to extend to the sewer or cesspool. The first of the stoneware traps to which he would invite attention was the Mansergh trap, which, although only introduced within the last few years, had had an extensive sale, and was much liked by many. Nevertheless, he, the lecturer, condemned it,—firstly, he said, because it was non-cleansing; and secondly, because it did not leave the end of the waste-pipe discharging into it open to the atmosphere. It was not only non-cleansing, but dirt-holding; for in use it must form itself into a "collecting-box," as there were in it no fewer than eight corners in which filth could accumulate. No amount of water sent through such a trap could be made to scour the parts fouled. The bottom was flat, the sides

* For reports of previous lectures see the *Builder*, vol. xl., pp. 651, 711, 775.

were vertical; the partition dividing the two compartments was upright, and the area of the surface-water of the trap was several times greater than the inlet or outlet, so that the standing water of the trap, with its decomposing matter, could not get changed by any single flush, nor even by many flushes, sent through its inlet. The bad air from this body of contaminated water, if it did not escape through a waste-pipe into the house, would at times get in at the window or door when near it. The arrangement of the inlet was bad, as it water-locked the discharging end of the waste-pipe, instead of allowing it to be exposed to the atmosphere. There was another evil in connexion with that trap, viz., that the waste-pipe being trapped at its outlet end,—*i.e.* the remotest end of the pipe from the sink or fitting,—would expose the house to any bad air or decomposing matter left in the pipe. In a trap which he (the lecturer) designed some years ago for receiving waste-pipes and intercepting them from the drain, there were three dips or air-barriers, to prevent drain-air reaching the ends of any waste-pipes discharging into the waste-receiving compartment. Like the Mansergh trap, it had two separate bodies of water. It was specially constructed for receiving waste-pipes from baths and lavatories when the latter were fixed on bedroom floors, and for protecting them from the drains, which it most effectually did. The trap had two important advantages over the Mansergh-trap. First, it left the end of the waste-pipe discharging into it open to the atmosphere. Secondly, the bottom of the trap was rounded, and its configuration made it easier to cleanse. But that trap was not self-cleansing, or, at any rate, not so much so as he should like it to be, for an ordinary flush or flushes sent through it would not cleanse it. Now, when a trap could not be thoroughly cleansed, and the whole of the water standing in it changed, by a good flush of water sent into it through its waste-pipe, it ought never to be used, and so, though he held the patent for the trap of which he had last spoken, he condemned it. The well-known gully-trap was now being used for receiving waste-pipes from sinks, &c., but he did not wish plumbers to be "gulled" into its use for such purposes. It might be a good trap for catching *detritus*, and, therefore, just the trap to use in yards and streets for surface drainage, but as traps for receiving the discharges from waste-pipes were not wanted for catching (in the sense of holding) anything in the shape of decomposing matter, the gully-trap was not the right kind of trap for sink, urinal, or lavatory wastes. It formed a catch-pit for filth and decomposing matter, and no ordinary flushes of water sent into such a trap would cleanse it. There were other traps of a non-cleansing character for disconnecting waste-pipes from drains, but which he had no time to stop to examine, as he must hasten on to consider the much-used drain syphon for trapping off sewers. That trap, being a round-pipe trap, would be self-cleansing if it had no "manhole," and if it were provided with means for a waterfall into it. Never, or very rarely, was any pressure of water brought to bear upon the standing water of the trap, and, consequently the latter never got properly changed by a flush of water; while the man-hole or "inspection" hole was a collecting-place for filth. Another evil in connexion with this trap was its want of ventilation, *i.e.*, it had no provision, on its inlet side, for ventilating itself or the drain with which it might be connected. He had dwelt upon the non-cleansing class of traps and severely criticised them, because he considered that bad trapping meant bad drainage, —certainly good trapping was absolutely necessary to good drainage. If perfection in the sanitary arrangements of a house were desired, attention must be paid to every detail, for, however well planned the plumbing and drainage might be, it would not be sanitarily perfect with non-cleansing traps under the fittings inside the house, or with filth-collecting traps on the drains outside,—*i.e.*, round about,—the house. When foul matter was discharged into a trap, it should pass through it as dreams through the brain, leaving no substance behind. Certain traps, which he called self-cleansing traps, would do this. The principles on which such traps were constructed, and the conditions under which they should be fixed, were,—1. The trap should be free from all angles, corners, and places where filth could accumulate. 2. A free-way should be made for the discharges to pass through the trap without breaking their form, — *i.e.*, the traps should be like a round pipe, so made or bent as to form a water seal, thus O. 3. The body-part of the trap, for fixing in horizontal pipes or drains, should be smaller than its inlet, so as to hold as small a quantity of water as possible consistent with the position in which it was to be placed and with the work which it would have to do, and so as to admit of the water being changed every time a flush was sent through it. 4. The minimum-sized trap should be used, consistent with circumstances, but governed to some extent by the size of the waste-pipe or drain on which it was fixed and by the flush of water likely to be sent into it. 5. The water-way into a trap should be larger than its body-part, or than the waste-pipe with which its outlet might be connected, so as to be able to allow of efficient water flushes being sent through the trap to cleanse it and to cleanse its waste-pipe. 6. The inlet or mouth of the trap should always be so arranged that the water flushes should fall upon the standing water of the trap with a vertical pressure, so as to drive everything foreign out of the trap, and to entirely change its previous contents. 7. The *inlet* side of all traps fixed upon drains outside the house should be open to the atmosphere, so that any bad air rising from foul matter decomposing in the trap or coming through it from the drain or sewer might readily pass into the open air or be largely diluted with fresh air before passing into any waste-pipe, soil-pipe, or drain discharging into such traps. In cold countries, where the water standing in the trap would be liable to freeze in severe frosts, the mouth of the trap should be sealed over, and the foot-ventilation or air-induct should be taken into the waste-pipe, soil-pipe, or drain some little distance away from the standing water of the trap (to prevent the cold air currents playing upon it and freezing it). In this country, in sheltered places, there was little risk, and if the trap (for disconnecting waste-pipes, soil-pipes, or drains) was kept well down into the ground in exposed places, there was no danger from frosts, though in severe frosts it was as well to throw a little straw over the grating of such traps. He had only heard of one such drain-disconnecting trap being frozen during the last severe winter out of hundreds that he had had fixed, scores of them, from circumstances, having their standing water within 15 in. of the ground level. Having shown by ocular demonstration that round-pipe traps are self-cleansing, the lecturer showed that such traps were syphoning traps, and especially when they had long vertical legs attached to their outlets. They were often called "syphons," and were so, in fact, under given conditions. Unless syphonage could be prevented, such traps would not only be useless, but dangerous. Though the D-trap and the "Bower" trap were not syphoned with anything like the ease with which syphon-traps could be, they were by no means proof against the action of discharges through the pipes on which they were fixed. Syphonage of traps could easily be prevented by ventilating the traps. A great deal of ignorance prevailed on the subject of ventilation of pipes and traps, and that, too, among men who considered themselves sanitarians. Many of them simply ventilated the main waste or soil-pipe, but did not ventilate each individual trap. They insisted upon the soil-pipe being carried up full-size to the open air, and in some cases they were willing to give it foot-ventilation, but no stack of waste-pipe or soil-pipe was properly ventilated which was not exposed to the atmosphere at both ends, and which had not, in addition, each trap ventilated. Bends in air or ventilating pipes, when made full-bore, made but a trifling difference in the ventilating capacity of the pipes, and it was therefore better to let such air-pipes follow the lines of the building, to a reasonable extent, than to stick up a hideous straight pipe, like a scaffold-pole with struts to support it. The lecturer pointed out that Mr. Pridgin Teale, in his book on "Dangers to Health," though he showed some valuable improvements on old plumbing practices, recommended an arrangement of bath and other wastes by which the water could easily be syphoned out of some of the traps, which would thus be not only useless, but dangerous. Plate II. in that book showed such a faulty arrangement. Having referred to numerous other diagrams and made several experiments in illustration of his remarks, the lecturer, in concluding, observed that those of his hearers who desired to push their inquiries farther would doubtless have an opportunity of seeing and examining many traps and other appliances at the Medical and Sanitary Exhibition, which would be opened at Kensington in a week or two's time.

A hearty vote of thanks was given to the lecturer, and the Chairman announced that the specimens of plumbing work made by the workmen attending the lectures in competition for the prizes offered in connexion therewith would be exhibited at the Exhibition mentioned if sent in before the 12th of July.

The lecture was to be repeated this (Friday) evening, the 1st. The next lecture of the course will be delivered on the 14th inst.

THE SEWAGE QUESTION.

At the ordinary meeting of the Sanitary Institute of Great Britain, held at 9, Conduit-street, on June 21st, Dr. A. Carpenter in the chair, a paper was read by Prof. W. H. Corfield, M.A., on the Present State of the Sewage Question.

After reviewing various systems, filtration through soil and wide irrigation were treated of at some length. Certainly the sewage had been satisfactorily purified, he said, in many cases, the conditions for satisfactory purification in winter being that the sewage should pass through the soil and not merely over it. Crops of all kinds had been grown by means of it, and in soil that would otherwise bear nothing; and the British Association's Sewage Committee had shown that as great a percentage of the manurial constituents had been utilised as was on an average utilised of the best commercial manure. Although, for various reasons, it had seldom been found to be remunerative, the reader adhered to his opinion formulated ten years ago that sewage irrigation would ultimately be remunerative in many instances, and that opinion was shared by the committee appointed by the Local Government Board in 1876 to inquire into modes of treating town sewage. An irrigation farm should be supplemented by a filter bed to receive and purify sewage when it is not wanted on the farm. The supposed dangers from the proximity of such farms, or from the spread of entozoic disease, were found to be purely imaginary; it was on the whole a better solution of the question for a large number of places than any other, and if, as was very likely, we had a series of dry years, its adoption would receive a great impulse. Where towns cannot make sewage utilisation pay, they must be content to be taxed to a slight extent to get rid of a most serious nuisance, and to secure a low death-rate.

SALES OF BUILDING LAND AT WALTHAMSTOW AND WALHAM-GREEN.

LAST week, Messrs. Protheroe & Morris offered for sale, at the Bakers' Arms, Lea Bridge-road, Walthamstow, eighty-three lots of freehold building land, being part of the Boundary-road estate. Several plots, having frontages of 15 ft. to the Boundary-road, by a depth of 74 ft., realised an average of 60*l.* each; whilst other side lots, of 15 ft. frontage, were sold for 45*l.* each. A tavern plot, having a frontage of 43 ft. to Rosebank-road, by a depth of 116 ft., realised 176*l.* With the exception of nine plots, all the lots offered were sold.

Mr. Charles Belton offered, at the Windsor Castle Hotel, Hammersmith, 105 plots on the Ravensworth House estate, at Walham-road. The property was described as having frontages to the Fulham-road and Cassidy-road, and being within a few minutes' walk of the Metropolitan District Railway station. There was a very large attendance at the sale, with an active and close competition for the several plots offered, the land being manifestly in great demand for building upon. The first lot offered was a corner shop plot, having a frontage of 17 ft. to the Fulham-road, for which there were several bidders, the lot being ultimately sold for 350*l.*, and an adjoining lot having a similar frontage to the Fulham-road realised 305*l.* Another corner plot, with a frontage of 20 ft. to Fulham-road, and a return frontage to Cassidy-road, reserved for a public house, and which it was stated would be the only one allowed on the estate, was sold for 410*l.*; whilst an adjoining lot, having a frontage of 17 ft., realised 285*l.* The remaining lots, having frontages of 16 ft., chiefly to the Cassidy-road, and intended for the erection of private residences, realised an average of 98*l.* per plot. The particulars only announced fifty-four lots for sale, but these having all been sold within an hour, and there being a dis-

position evinced by the company that more lots on the estate should be offered, the auctioneer put up the remaining portion of the estate, comprising forty-nine lots, all of which were quickly sold, the total number of lots disposed of being 105, and the aggregate proceeds of the sale amounting to 12,083*l.*

VALUE OF LAND AND BUILDINGS AT SOUTHEND.

SOUTHEND, as a seaside resort, is now said to be attracting large numbers of visitors, and building on an extensive scale is in progress in the locality. Messrs. Beadel & Co. held an important sale last week of property at Southend, when a piece of freehold land, called Shore Field, facing the sea, containing a little more than nine acres, was sold for 4,100*l.*; two enclosures of freehold land, containing twelve acres, realised 6,700*l.*; the Round House and five acres of freehold land fetched 2,020*l.*; four plots of freehold land, containing eight acres, were sold for 4,650*l.*; Grove Field House, and four plots of land adjoining, containing about three acres, realised 2,000*l.*; and twenty plots of freehold land, containing a little more than twelve acres, were sold for an aggregate sum of 6,180*l.* The total proceeds of the sale were 32,470*l.* The prices realised for the land amounted to an average of 500*l.* an acre.

ST. BOTOLPH'S, ALDERSGATE-STREET.

THE burial-ground of this parish, after having been closed for a number of years, has recently been transformed into a pleasure-garden, greatly to the benefit of the denizens of this busy and populous neighbourhood. The labyrinth of time-worn upright slabs, yclept monuments, the inscriptions on which, having through decay ceased to record the purpose of their presence, have been mostly gathered together and placed against the boundary-walls. The vestry and churchwardens are to be commended for giving an additional lung to the City. With a view to date and mark this improvement, they have erected a handsome sun-dial in the centre, the work of Mr. Forsyth. The pedestal is executed in Portland stone, and is elevated on a platform of the same material, which can be used either as a step or a seat. On the base of the pedestal appears the following inscription: — "This ancient Burial-ground, converted into a garden by the vote of the Parish Vestry, and with the concurrence of the Vicar, was opened to the Parishioners by John Staples, esq., F.S.A., Alderman, on Thursday, October 28th, 1880. S. Flood Jones, M.A., Vicar; George Sims, C.C., John C. Hutchinson, Churchwardens. 1881."

IRISH JUDICIAL DECISION ON BUILDERS' LIABILITIES FOR ACCIDENTS TO WORKMEN.

IN the Belfast Recorder's Court last week, before Mr. Otway, C.C., a cause, "Murray *v.* Pauline," has been decided. The plaintiff, a bricklayer, sought to recover the sum of 40*l.* from William Pauline, of Belfast, builder, for damages sustained by him by falling off a scaffold which defendant had supplied, and which, as alleged, had been erected negligently and insufficiently.

His Worship, in giving his decision, referring to the Employers and Workmen Act, said that statute was chiefly passed with the object of giving a remedy to parties injured by the neglect of their employer,—to remedy what was considered an existing defect in the law. It contemplated, as far as was applicable to that case, the employer using for the purpose of his business certain works and machinery, and provided against injury from any defect in the machinery where such defect arose from the negligence of the employer, but it debarred a remedy when the workman who was injured knew the defect. The case, he thought, must then rest upon the previously existing law, and by that they all knew that the workman who engaged in a dangerous employment took all its ordinary risks, and the master was only bound to provide for the safety of the servant to the best of his judgment. There was no obligation upon the master to take more care of his servant than he would of himself. Here was a man who was a builder. He employed the plaintiff, who was a mason, to build a wall from 7 ft. to 10 ft. high. The workman put up a scaffolding; the employer went to him and doubted whether the scaffolding was sufficient; the workman replied, that "if he fell he would not have far to fall." But the master, thinking to make it more safe, put a piece of timber under the transverse plank. The scaffolding came down, the man fell a distance of 3 ft., and his arm was broken. Upon these facts his Worship held that the common law did not apply either: that it was a mere misadventure, and that the defendant was therefore not liable. He would, therefore, dismiss the case.

Mr. Ward, for the defendant, said he would not press for costs.

THE ART-UNION OF LONDON.

IF the question were asked,—What is the most potent factor in regulating economic operations in England at the present time?—would not the obvious answer be "Co-operation"? The wondrous results of this organisation, as announced at the meeting held a short time since under the presidency of Lord Derby, show the dimensions it has attained. In London who would have dreamed that the few chests of tea purchased by a small number of Post-office clerks, and divided amongst themselves at cost price, would be the germ of that system which is now represented by numerous associations, occupying buildings of large size and costly arrangement, and turning over hundreds of thousands of pounds annually?

A remarkable instance of this co-operative power is given in a work now being issued by the Art-Union of London. We allude to the set of etchings, very successfully produced by Mr. Flameng, from Mr. Frith's remarkable series of five pictures,—"The Road to Ruin." Every subscriber of one guinea to the Art-Union will receive this set of first-class prints, in addition to a share in the distribution of prizes, a work which no publisher could afford, single-handed, to produce for many times the amount; it happens, in fact, that, at this moment, a series of five plates, of a cognate subject, from paintings by the same artist, is offered to the public at the price of ten guineas, though the process employed to produce the engraving is really less artistic than the style of pure etching adopted by the Art-Union.

We must here notice how Science steps in to the aid of her art-sister. It would be impossible to produce within any reasonable time, by printing from the original five plates, the number of impressions which, judging from the demand for the chief works of the Art-Union, will, in all probability, be required to supply the subscribers in all parts of the world, but by the aid of that marvellous power which "puts a girdle round about the earth" in less time than Puck undertook to do it in, a reproduction of the plate is so accurately made that not the slightest difference can be perceived by the strongest magnifier between that and the original. The deposit of the infinitely minute atoms of the metal in the matrix is so subtle and so true, that the faintest indication in the original is accurately repeated in the other. By means of this multiplication of plates, any number of impressions, all of equal value, can be produced; and thus, within a comparatively short time, all the subscribers can be supplied.

Our readers will doubtless remember the pictures, which were always surrounded by a crowd in the Royal Academy Exhibition of 1878. Our modern Hogarth selects for his theme a phase of life of the nineteenth century with which all are, more or less, familiar. The story opens with a college card-party, just breaking up, at early dawn. The host, by his surroundings, is evidently gently nurtured and with abundant means. The painter then takes the hero to Ascot, where he stands, betting-book in hand, on the lawn, in the midst of fair women and the *élite* of the upper ten thousand. The not unfrequent result of a life so commenced ensues, and we have a visit from the bailiff's followers, foreshadowing the sacrifice of the costly furniture and all the appliances for a luxurious life by which we see the hero surrounded. Then follow exile, and the family with its scanty belongings seeking shelter in some small town in France or Belgium. The man and wife are endeavouring by pen and pencil to earn something to keep the wolf from the door, when the landlady enters with a long bill. In the last scene we are back again in England, and in a miserable attic; the early dawn looks in on a scene, how different from that gay party at Cambridge! The hero hurriedly looks the door, while on the table is a pistol, with caps and balls, terribly presaging what may be the object of their purchase.

We have here a series of scenes which pre-eminently tell their own story, and this is always a great element of success, since the majority of people like to be saved the trouble of thinking much before they arrive at the meaning of a picture. In this, as in everything else in the present day, we are all too much in a hurry to spare time for any one particular subject. The paintings themselves can be seen for a few days at the rooms of the association in the Strand.

RESTRICTIONS IN FEU CONTRACTS.

HISLOP *v.* LECKIE.

THIS was an appeal to the House of Lords from a judgment of the Court of Session in Scotland. The case was argued a short time ago, before the Lord Chancellor, Lord Blackburn, and Lord Watson, when judgment was postponed.

Their lordships, in giving judgment on the 23rd ult. said that the effect of the interlocutors appealed against was to enforce against the appellant, a carriage-builder in Edinburgh, at the suit of the respondents, who were adjoining occupiers, certain restrictions on building contained in a feu contract. Those interlocutors were right if the respondents, who were neighbouring feuars under the same superior, were, by the combined effect of their own and the appellant's titles, interested in the obligations and restraints imposed upon the appellant by his feu contract, so as to be able to enforce these obligations and restraints for their own interest, if the superior was or ought to be deemed a party complainant in the action in such a sense as to be suing for his own separate interest. Their lordships were of opinion, however, that the fact of several feuars of the neighbouring plots of building-land in the same street holding from a common superior did not of itself entitle one of those feuars to claim the benefit of restrictions contained in the feu contract of another, unless some mutuality and community of rights and obligations were otherwise established between them, which could only be done by express stipulation in their respective contracts with their superior, or by reasonable implication from some reference in both contracts to a common plan or scheme of building, or by mutual agreement between the feuars themselves. Here there were none of those things, and as the mere consent of the superior to the action being brought did not place him in the position of having brought the action in his own interest, the finding of the Court of Session in favour of the respondents must be reversed.

Judgment reversed with costs.

A WATER COMPANY FINED FOR INADEQUATE SUPPLY.

AT the Thames Police-court, last week, the secretary of the East London Waterworks Company was summoned before Mr. Lushington, by the owners of Sampson's House, Albion-street, Mile-end, for neglecting and refusing to furnish an adequate supply of water, for which the rates had been duly tendered and paid. Mr. Young, solicitor, conducted the prosecution. There were no fewer than twenty-eight summonses against the company for not providing a proper supply of water.

It was stated that there were two cisterns on the premises, 23 ft. from the ground, but the adjoining houses were supplied from butts only 4 ft. from the ground. Each cistern when full held about sixty gallons of water, but from the 15th of May until the 19th of June the supply was insufficient for the wants of the persons living in the house, and they had to borrow water from neighbours. The supply-pipes in the cisterns were in proper order, but the water was only laid on for twenty minutes, and did not flow freely.

Mr. Lushington, the magistrate, said he had no doubt that there was not a sufficient pressure of water. He imposed the full penalty of 10*l.* for that offence. The rates had been paid for the last two years, and the complainants were entitled during the whole of that time to a proper supply of water. He fined the defendants 20*s.* and 2*s.* costs on each of the twenty-seven summonses, and 5*l.* 5*s.* costs; making a total of 44*l.* 19*s.* to be paid to the persons who paid or tendered the rate.

Silk Cultivation.—Professor Luigi Sartori, of Treviso, after long study and outlay, has, he says, discovered a perfect system of cultivating silk-worms, a system by which Italy will be enabled to save 500,000,000 francs per annum. Since 1872, the *Japan Weekly Mail* says, Sartori has been delivering lectures on his new method in the various Italian towns, and, if rumour may be credited, his motives are purely patriotic. At a meeting lately held in Rome, Sig. Miraglia, president of the Agricultural Society, and many other competent persons, were present, all of whom declared themselves quite satisfied as to the importance and great advantages to be derived from Sartori's system. As a result of this meeting he received a Government prize of 500 francs, and had the honour of an audience with his Majesty the King, to whom he explained his scheme in detail. The King said that steps ought to be taken for overcoming the apathy of the Italian producers in this matter, by making them acquainted with the advantages of the new system. In order to show what interest he himself took in the industry, he ordered the construction, at his own expense, of a movable house for reproducing silk-worms, after the design of Sig. Sartori, to be exhibited at Milan.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

2,530. G. F. Wynne, Wrexham. Drilling, boring, or cutting rock, &c. June 10, 1881.

2,536. L. W. Beck, Duffel, Belgium. Drying ceramic products and bricks. June 10, 1881.

2,539. M. Delmard, Plumstead. Chimney cowl and ventilator. June 10, 1881.

2,555. A. Harvey, Glasgow. Water taps or valves. June 13, 1881.

2,559. G. F. Wynne. Wrexham. Drilling, boring, or cutting rock, &c. June 13, 1881.

2,561. C. H. Pennycook, Glasgow. Bars for securing glass for windows, &c. June 13, 1881.

2,576. W. J. Hopkins, Worcester. Expanding and contracting fire-grates. June 14, 1881.

2,590. W. R. Lake, Southampton Buildings. Grate-bars, &c. (Com. by W. N. Fairbairn, Boston, U.S.A.) June 14, 1881.

2,616. G. Hodson, Loughborough. Manufacture of chimney-pieces, &c. June 16, 1881.

2,624. W. T. Sugg, Westminster. Gas cooking-stoves. June 16, 1881.

2,628. W. W. Beaumont, Camberwell, and J. Welman, Poole. Apparatus for dressing and cutting stone, &c. June 16, 1881.

2,629. G. A. Wright, Portsmouth. Materials for forming blocks for use in buildings, &c. June 16, 1881.

2,633. S. Hodgkinson, Manchester. Window-blinds. June 16, 1881.

2,636. G. J. Cox, Maidstone. Gas cooking and heating stoves. June 16, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending June 18, 1881.

1,448. E. R. Hollands, Stoke Newington. Fire-grates.

The fire-basket has a movable bottom, and when the fire is to be fed, a set of bars enter from the back horizontally, and lift the fuel off the movable bottom, which then falls down and the fresh fuel is put thereon below the fire. The movable bottom is then raised and the horizontal bars drawn back. Oct. 30, 1880. Price 8d.

1,504. A. Jennings, Glasgow. Fire-places, &c.

The bottom and the back of the fireplace are made of brick, curving outwards at the upper edge, and the products of combustion flow backwards into a short flue pipe, which has a curved plate placed over its upper end to prevent any down-draught. A metal casing is formed above the fire-place, communicating by pipes with the outside air and the apartment, whereby the air of the apartment is thoroughly warmed. Nov. 4, 1880. Price 6d.

4,540. R. H. Reeves, Parkhurst. Apparatus for detecting the escape of noxious gases from drains.

A U-shaped tube is connected to the drain, which is partially filled with a chemical re-agent in solution. Potassic permanganate is diluted with acetic acid is preferred. A test paper prepared to be sensitive to the re-agent is inserted in the end of the tube, and a graduated scale is provided. The pressure, as well as the quality of the gas in the drain is thus determined. Nov. 5, 1880. Price 6d.

4,542. L. W. Leeds, Woburn-place. Steam heating apparatus.

The firebox is lined with fire-clay, and a large fire-brick is hung above the fire, leaving only a small annular passage for the escape of the products of combustion. This ensures thorough combustion of fuel. The generation of the steam is regulated by an air-pipe leading to beneath the grate-bars with another branch leading to the space above the suspended fire-brick, &c. The port of this pipe is controlled by a slide connected to a weighted lever, operated by a piston, whose motion is governed by the pressure of steam in the boiler. This pressure, as it increases, closes the air-port and checks the draught. Nov. 5, 1880. Price 6d.

4,544. H. H. Lake, Southampton-buildings. Furnaces or fireplaces for the combustion of fuel without smoke.

The fuel is fed through an opening arranged above the grate, and above the ordinary door, which has an inclined feed throat, upon which the fuel forms, in front, a heap having sufficient slope to allow it to fall upon the back part of the grate, where the combustion takes place. (Com. by La Société Nessi Frères, Paris.) Nov. 5, 1880. Price 6d.

4,585. W. S. Melville, Mile-end. Apparatus for supplying fuel to fireplaces.

A shovel has a chamber formed in the after part, which has a hinged flap as a cover. The handle of the shovel is hollow, and receives the stem of a piston. The chamber is charged with fuel, and the flap closed. The shovel is then slidden into the lower part of the fire, the flap is lifted, and the piston ejects the fuel into the fire. The smoke is in this way consumed. Nov. 9, 1880. Price 6d.

4,640. H. J. Haddan, Strand. Apparatus for regulating and measuring the flow of liquids.

A vertical cylinder encloses a piston. A horizontal cylinder is connected to this below the piston, at the other end of which is an inlet chamber, provided with a disc valve. As the water enters by two orifices, it removes the valve a little from its seat, and so passes through the cylinder and up between the circumference of the piston and the inner surface of the vertical cylinder. If more water enters than can flow through this annular passage, the piston is lifted, and thereby actuates a lever in the horizontal cylinder, which causes the disc valve to partly close the passage. (Com. by E. de P. Isaura y Fargas, F. Garcia y Corvers, and J. Barrufet y Veciana, Barcelona.) Nov. 11, 1880. Price 4d.

4,660. H. E. Cooper, Great Dover-street. Syphonic apparatus for closet flushings, &c.

A syphon pipe is attached by a flexible tube to the outlet pipe, and is held suspended by a lever with the bend a little above the level of the water. When it is pulled suddenly down, it establishes a syphonic action. (*Pro. Pro.*) Nov. 12, 1880. Price 2d.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

CITY CHURCH AND CHURCHYARD PROTECTION SOCIETY.

THE second annual meeting of this society was held on the 23rd ult. in the Egyptian Hall of the Mansion House, under the presidency of the Lord Mayor.

Mr. Wright, hon. sec., read the report, from which the following is a quotation :—

"The Council, in presenting their second annual report, are deeply thankful to be able to announce that the yearly destruction of a City church, which had been the average for the past ten years, has, since the formation of the society, happily ceased. They cannot, however, believe that all attacks have ended, but have been postponed in order that the public mind may be prepared for some more drastic scheme on the publication of the census returns of those who slept in the City on the first Sunday in April. But, fortunately, there will be equally reliable statistics from the day census taken by the Corporation as to the vast numbers of those who spend the greater portion of their lives within the confines of the City parishes. The attention of the council has been drawn to a return published in the *St. James's Gazette* for June 13th, 1881, professing to give returns of the congregations of the City churches, which they believe to be misleading. That census is based on the attendance at the morning service, but those in the habit of worshipping in the City churches know that the evening services are frequented by much larger numbers."

Mr. H. C. Richards, in moving the adoption of the report, gave it as his view that there were signs of a disposition, on the part of merchants and others, to reside in the City.

Mr. C. Kegan Paul seconded the motion. He did not propose to enter at any length into the arguments for the retention of their churches and churchyards, as he had already done so in a recent number of the *Nineteenth Century*. Supposing the churches were empty on the Sunday, and even supposing they were not utilised during the week, yet they should not be pulled down. He believed the time would come when the resident population of the City would be much greater than it was now. But apart from this there was the historical and architectural value of the churches.

The report was unanimously adopted.

The Rev. Canon Venables (of Lincoln) moved, "That this meeting expresses its satisfaction at the success which has hitherto attended the efforts of the Society." Although he was an ardent lover of Gothic, he was eclectic in his admiration, and he was a great enthusiast for Sir Christopher Wren's churches. When he looked back he could remember the grand old buildings,—St. Michael's, Queenhithe, and St. Benet's, Gracechurch-street. He could never forget the graceful spire of St. Antholin's, and he could not understand why it was swept away. He believed if City clergymen would give good services and live in their parishes they would get people to attend church.

The Rev. Canon Shuttleworth seconded the motion, which was adopted, as was one pledging the meeting to support the Society in further action to prevent the demolition of any more of the City churches.

ARCHITECTS AND QUANTITIES.

SIR,—"H. H. B.'s" letter in your issue of June 18th would surely have been better unwritten. An impartial observer would come to the conclusion that the merits of "H. H. B." and the surveyor's clerk had been compared, and that the comparison had been unfavourable to the architect. It is nonsense to argue that a man makes a change like that as a pure matter of caprice. The result was, no doubt, galling, but it surely is not sufficient justification for the mud "H. H. B." throws at surveyors generally towards the end of his letter. Would the contents of the "snugly-packed nutshell" have been less if "H. H. B." had carried out the work and taken off the quantities in his own office? or, for the matter of that, in any case where the architect attempts it? C. P.

The Rowland Hill Statue, Kidderminster.—The statue recently unveiled at Kidderminster is placed upon a pedestal of Cornish granite from the Carnsew Quarries of Messrs. John Freeman & Sons, Penryn.

"KING INA'S PALACE."

SIR,—You may, perhaps, remember that some twenty or thirty years ago there was a talk of my buying the Mediæval house called King Ina's Palace for the purpose of preserving it, but from circumstances into which it is now useless to enter I did not do so, and it fell into the hands of some one who knew nothing or cared nothing about architectural history, but who had some money, and he employed the builder of a neighbouring town, who dubbed himself an architect, to "restore" it, as he called it,—in other words, to destroy all that gave it any value. The peculiarity of it was that the original woodwork and all the internal arrangements were entirely preserved, of which I know no other instance. My lamented friend Burges, whom I have lately lost, told me that some friend of his, another young architect I think, had a complete set of drawings of it, if I liked to buy them and have them engraved. It was not convenient for me to do this at the moment, and I let the opportunity slip, which I now regret. Perhaps you can tell me who this was, and whether the drawings are still to be had? If you do not happen to know, perhaps you can make inquiry for me, and let me know the result.

Some twenty years ago, after my long and serious illness at Windsor, I was sent to Rome by my doctors, and I spent fifteen winters there, becoming so much interested in the archæology of Rome that I somewhat neglected that of England for a time. I am now forbidden to go there again, and am told that I must remain quiet in England for the remainder of my days.

JOHN HENRY PARKER, C.B.

*** We do not know if the drawings are still to be had, but we hope one of our readers will give the required information. We have good reason to remember "King Ina's Palace," for the insertion of a letter at the period above referred to, from an eminent archæologist, commenting on the restoration, and our refusal to give up the name of the writer, brought upon us, as Mr. Parker will recollect, an action for libel, and cost us much trouble and more than 300*l.* The second and only other action for libel that we have had to defend was brought on us by the insertion of a short letter exposing the condition of a back-yard near Charing Cross, the correctness of which was proved by several witnesses, and for which we were mulcted in the sum of 250*l.* It is thus that enlightened British juries have expressed their admiration of long-continued efforts on the part of the *Builder* to protect our ancient monuments and improve the health of towns! However, we are not complaining; we are simply telling a story which is not uninstructive.

ASHBURNHAM HOUSE.

SIR,—I see that in your last week's print there is a short letter signed "G. J.," wherein the question is very rightly raised, at this time, as to who was the architect of this noteworthy building.

I think it would be well for students if you encouraged the bringing out as many facts as possible on the subject; and if you brought forward the opinions of sound judges of style, some satisfactory decision might be come to. My own opinion (sound or unsound) is, first, that the house was designed by a skilled architect of the time, and not by a mere follower of the fashion of the day; secondly, that the style is more free from the vice of stateliness, with its attendant dulness, which so cursed the Renaissance art of Europe, than is seen in Wren's or the architecture following his. Wren was so great a man that he avoided the worst faults of the style; but I have seen no work of his where so much richness and invention are allied to such simplicity and directness as is plain on the face of the original parts of Ashburnham House. On close examination of the detail it will be seen that, here and there, and that frequently, there is some touch of the naturalness and invention of an earlier style. Notice the conventional roses in the pierced scroll-work; the pattern in the soffit of the corona of one of the cornices; and the leafage in the carving of the projecting beads of the panel frames. Also, notice the rather rude but vigorous and artistic way in which the great egg-and-tongue moulding is carved on the staircase. These things alone would not have biassed my mind very strongly; but finding them in combination with admirable proportion, with such aptitude in adapting the so-called Classic

forms; and, lastly, but the most telling point of all, seeing what an appearance of space and dignity is gained, and yet with a homeliness of effect, I cannot but think that the architect of Laud's Quadrangle, at St. John's College, Oxford, built Ashburnham House, Westminster.

PHILIP WEBB.

SYNTACTIC ARCHITECTURE.

SIR,—The Maudles and Postlethwaites of architecture who continue to "exist beautifully," and, in spite of their apparent unmanliness, manage, by some means, to increase and multiply, must admit that there must be some proportion between width and height both in a whole building and in a section, or bay. It is time that something were done to draw up a set of rules as a guide to assist in designing, but not to obstruct.

The Vitruvian rules, I admit, are by far too rigorous, and their enforcement was one of the causes that led to a reaction in the opposite direction.

Many customs, manners, and costumes have had their origin in architecture. The æsthetic school of the present day clearly owes its origin to the pleasing school of architecture. Architecture, therefore, has a great responsibility, even though it be partly accidental.

It will, I think, be a moral disgrace to our profession if we do not use the means that we find are in our power of putting an end to what is literally nauseous.

W. S.

MILDEW.

SIR,—I would advise "A Reader" to try tinfoil. I have used it in several trying situations myself, and it has always succeeded. It may be applied to the wall by means of a paste made of thick white-lead paint, taking care to let all get well dried before papering over it. Although the first cost may be rather more than some of the other and more usual, though practically worthless, preparations, it will be very much cheaper in the end. The cost of the tinfoil will be about 7s. 6d. per roll of thirty-six sheets, each sheet measuring 18 in. by 16 in.

H. G.

FORFEITURE OF BUILDERS' GOODS TO FREEHOLDERS.

THE following memorandum has been addressed to the Committee of the House of Commons now considering the Bill of Sale question, and deserves consideration:—

Will you pardon my drawing your attention to a matter which would, I venture to suggest, be worthy of investigation by you, as it seriously affects merchants trading with builders?

It is now perpetually the case in the failure of a builder for the creditors to find that the bricks, timber, lime, iron, lead, and other goods supplied to the builder are, although not fixed to the building, but simply lying loose on the ground, claimed by the landowner, under a clause in the building agreement, which forfeits to the landowner all loose material in the event of the builder filing a liquidation petition.

Surely, as against the creditors of the builder, this is a most vexatious clause, and should be altogether prohibited by law, or, at least, deeds containing such clauses should be registered as bills of sale.

It is a very easy and common thing for an owner of land to "get a man of straw" to build for him under the foregoing conditions, coupled with promises of never-failing funds, on the strength whereof the builder gets large quantities of goods on the job, and when his liabilities fall due, the landowner not finding sufficient money to enable the builder to pay for such goods, the builder is compelled to file his petition, and the landowner, under the forfeiture clause in the building agreement, takes possession of the land, buildings erected thereon, with the creditors' goods, and more particularly of the loose goods on the ground; and when the builder meets his creditors he simply informs them of this, and expresses regret, alleging the landowner has deceived him.

The creditors cannot help themselves, and feel bound to accept almost any offer that is made, such offer very often being secured by the landowner.

ROBERT GIFFORD, A. C. A.

The Proposed New Railway Station at Blackfriars.—Last week a Select Committee of the House of Lords passed the Bill authorising the London, Chatham, and Dover Railway Company to construct a double line of rails, commencing at the south end of Blackfriars passenger station and terminating at the south side of Upper Thames-street. The Bill gives powers to the company to carry the lines across the Thames either by widening their existing bridge at Blackfriars or constructing a separate bridge with four sets of piers in the river similar to the present one. These works are about to be carried out in order to relieve the city and suburban lines of this company.

CHURCH-BUILDING NEWS.

Four Elms, Kent.—The new Church of St. Paul, Four Elms, near Edenbridge, has been consecrated by the Archbishop of Canterbury. The building, which is Early Thirteenth Century in style, consists of nave, transepts, and chancel. On the north side of the latter are the vestry and organ-chamber, and at the west end of the church is a semicircular recessed baptistery. The walls are of Portland cement concrete, faced externally with Limpsfield stone, and internally with Bath stone, relieved by bands of Tonbridge sandstone. The dressings are of Box-ground stone. The open-timbered roof, which is of pitch-pine (all the rafters and timber left in their natural state, and the boarding between stained dark walnut), is covered with tiles, and surmounted by an oak *flèche*, containing the bell. The seats and fittings throughout are also stained walnut, and varnished. The east end is square, and contains a window of five lancet lights, the inner order of the arch-mouldings being carried on detached shafts of blue Pennant, with moulded bands and carved caps. This window is filled with a representation on the principal fields of the "Ascension," under which are five groups,—the "Agony," "Bearing the Cross," the "Crucifixion," the "Resurrection," and "Noli me tangere." The subjects occupy the entire area, without canopies. The windows on either side of the sanctuary contain our Lord as the "Bread of Life" and the "True Vine," and two other windows in the chancel the "Good Shepherd" and the "Light of the World." All these have fields of foliated ornament. The south transept, or St. Paul window, of three lights, contains the "Stoning of Stephen," "Conversion of St. Paul," and "Preaching at Athens." These all have canopies. The baptistery contains seven lights,—two, the "Passage of the Red Sea"; two, "Noah Entering the Ark"; and the centre three, "Christ Blessing Little Children." All the glass has been executed by Messrs. Clayton & Bell. The floor of the chancel is in rich tiles and mosaic, by Messrs. W. B. Simpson & Sons. The font, which is of Caen stone, was executed by Mr. Bradford, of Kennington. The pulpit, which is in character with the font, was executed by the builders. The rails, &c., to pulpit steps are of hammered and polished brass, and, together with the pendent and standard lamps, brackets, &c., were executed by Messrs. Faraday & Sons, of Berners-street, W. The organ is by Messrs. Gray & Davison. The heating apparatus is by Messrs. Bacon & Co. The brass lectern and the altar-cloth are by Messrs. Frank Smith & Co. The builders were Messrs. Punnett & Sons, of Tonbridge; and the whole of the work has been carried out from the designs and under the superintendence of Mr. Edwin T. Hall, of London.

Monmouth.—The restoration of St. Mary's Church, Monmouth, has been commenced. The architect is Mr. G. E. Street, R.A., and Messrs. Wall & Hook are the contractors.

Heaton Norris.—A meeting of parishioners has been held to consider alternative plans prepared by Messrs. Preston & Vaughan, architects, of Manchester, for the enlargement of the church. In either scheme it was proposed to form a quasi-chancel or *chorus cantorum* by enclosing the most easterly bay of the nave with screens of light open wood-work on the north, south, and west sides; and by raising the floor two steps above the level of the present nave floor. New reading-desks and choristers' seats would be placed in this quasi-chancel, and the floor between the seats would be laid with encaustic tiles. The present west entrance would be entirely re-arranged in order to render it more convenient for worshippers entering or leaving the church, and the font would be removed to the west end of the north aisle. In the first or lesser scheme the present vestry would be retained, and a porch with a staircase leading to a new choristers' vestry above would be erected on the north side of it. The organ would be removed from its present position in the west gallery, and placed in the north-east corner of the north gallery. In the second scheme it was proposed to extend the present sacrarium about 9 ft. eastwards, in order to form a chancel of due proportions to the size of the church, and to build new priests' and choristers' vestries on the north side of it, with porch and staircase leading to a spacious organ-chamber above. The organ chamber would be open to the church on the south and west sides, and there would be traceried screens in the archways. Under the east window, which would be remodelled, there would be a new reredos. After some discussion it was resolved unanimously to adopt the second scheme, and to apply for a faculty for its execution.

Ryde, I.W.—Mr. Barton, the contractor for the completion of the parish church, has commenced the work. The architect of the church was the late Sir Gilbert Scott, R.A., and his son, Mr. John Oldrid Scott, has prepared the plans for the completion of the tower and spire, &c. The tower is to be built of the best Swanage stone, in irregular courses, 80 ft. from the ground, and finishing with a battlemented parapet, with carved pinnacles at each corner. The spire will be octagonal in shape, and will be decorated at the base with four crocketed double-pinnacled lights. The spire will be built with the best Box-ground Bath stone, terminating with a cap of solid Portland stone.

Poole.—The corner-stone of a new organ-chamber and vestries for Parkstone Church has been laid by Lady Brown, of Hillside, Parkstone. These additions, the site of which is on the north side of the chancel, are of Gothic design, harmonising with the present structure, and the dimensions are,—vestries, 44 ft. by 16 ft., and the organ-chamber 12 ft. by 14 ft., with a height of about 30 ft. Mr. Pearson, R.A., is the architect; Mr. S. Clarke, of Parkstone, the builder; and Mr. H. F. J. Barnes, of Poole, the clerk of the works.

Ludlow.—The new Church of St. John the Evangelist has been consecrated. The foundation-stone was laid on the 10th of June last year. The church is situated on a commanding site on Gravel Hill, and it is built in the Early English style. It consists of a nave, chancel, south aisle, vestry, and porch, the dimensions of which are as follow:—Nave, 74 ft. long by 24 ft. 4 in. wide; chancel, 30 ft. by 22 ft. 3 in.; south aisle, 77 ft. 10 in. by 10 ft. 9 in.; vestry, 15 ft. 6 in. by 11 ft. 6 in.; porch, 7 ft. 6 in. by 7 ft. From the floor, the height of the nave walls is 23 ft.; the chancel, 21 ft.; and the south aisle and vestry, 11 ft. The height to the apex of the nave roof is 43 ft., and 38 ft. to the apex of the chancel. A lean-to roof is placed over the south aisle. The timber used in the construction of the roof is of wrought and moulded pitch pine. The chancel roof is boarded on the underside with pitch-pine, and divided into panels, with moulded ribs and cornice. The walls of the church are built of native Pennant stone, with rock face, and squared beds and joints. The external dressings to the windows, doors, buttresses, bell-turret, and gate piers and copings are all of Box weather stone; and the internal dressings of the arcades and chancel arch are of Corsham Down stone. Provision has been made for a future north aisle; the arcade has been built, and the arches erected, with a two-light tracery window inserted in each arch. The bell-turret stands on the west gable of the nave, and rises about 20 ft. above the nave roof. The cost of the church is 4,000*l.* The architect is Mr. A. W. Blomfield, M.A., of London; and the contractors were Messrs. Wall & Hook, Brimscombe, Stroud.

Birmingham.—The foundation-stone of a new chancel to All Saints' Church has been laid. In connexion with the chancel two vestries will be built. Other works to be done include the removal of the side galleries, the re-seating of the church, and the provision of improved arrangements for lighting and heating the building. It is estimated that an expenditure of about 1,400*l.* will be required to effect the various improvements, which are being carried out by Mr. W. Robinson, builder, from the designs of Mr. J. A. Chatwin, architect.

SCHOOL-BOARD SCHOOLS.

London.—At a meeting of the School Board for London, on the 2nd ult., on the motion of Mr. Stiff, a recommendation of the Works Committee was adopted, to the effect that an expenditure of 290*l.* should be sanctioned for the erection of a cookery class-room on the Marlborough-road site (Chelsea). Mr. Stiff then moved the adoption of a report of the Works Committee, containing the following recommendations:—The committee have invited tenders for the erection of a school to provide accommodation for 1,100 children on the site in Lyndhurst-grove, Peckham. The committee recommend that so soon as the plans shall have been approved by the Education Department, the lowest tender, that of Mr. Tongue, of Plumstead,

amounting to 9,922*l.*, be accepted. Cost per head, school buildings only, 6*l.* 18s. 4d. Total cost per head, 9*l.* 1s. 8d. The committee have invited tenders for the enlargement of the school in Thornhill-road, Islington, by 200 places. The committee recommend that, so soon as the plans shall have been approved by the Education Department, the lowest tender, that of Messrs. Wall Brothers, of Dale-road, Kentish-town, amounting to 1,699*l.*, be accepted. Cost per head of school buildings only, 6*l.* 19s. 1d. Total cost per head, 8*l.* 9s. 10d. The school in Orange-street, Borough, was erected by the Board in 1873-4, and, in order to keep down the cost per head, no rooms were provided for teachers, and only an insufficient amount of cloak accommodation for the children. The committee think that these deficiencies should now be supplied, and they have accordingly obtained tenders for erecting three teachers' rooms, and also for providing proper cloak accommodation for the three departments of the school. The committee recommend that, so soon as the plans shall have been approved by the Education Department, the lowest tender, that of Messrs. T. E. Julian & Co., of Marshall-street, St. George's-road, S.E., amounting to 675*l.*, be accepted.

Stockton.—New Board-schools in Bowesfield-lane, Stockton, have been opened. The style adopted is described as "Early English, adapted according to the requirements of plain brick-work, in which all the coupled windows, arches, and mullions are executed." The central portion is occupied by the infants' school, the roof of which is higher than any of the others, being surmounted with a ventilating turret, with a steep-pitched lead roof and vane at the summit. This central block is flanked on the north and south by the girls' and boys' departments respectively, with ornamental terminals at the apices of roof. The main front and sides consist of a repetition of coupled lancet windows and piers, supporting arches and labels with ornamental scrolls of foliage, also fillings-in of bold terra-cotta bosses. This front is relieved by four projecting gables, which have each a lofty three-light window, comprised within a large arch, filled in with pointed diagonal brick-work. The top portion of these gables has a perforated stone ventilating band and red diaper work in relief, with a moulded stone finial and stone coping. Internally the schools are lofty, and lined with a dado 4 ft. high of glazed bricks, with coloured bands along top and base. The schools were built by contract, the price being 3,083*l.*; and the total number of children for whom accommodation is provided is 723. Messrs. Wetherell & Moses were the architects; Mr. Lazenby was the builder; and Mr. John Bage the clerk of works.

Warley (near Sowerby Bridge).—The corner-stone of a new girls' school for the Warley School Board was laid on Whit Monday. The building, when completed, will be a substantial structure, provided with all modern appliances. Mr. Utley is the architect.

Aston.—New Board-schools in the Albert-road, Aston, have been opened. The schools consist on the ground-floor of the boys' school-room, 80 ft. 8 in. long by 22 ft. wide, with three class-rooms, each 24 ft. 8 in. by 22 ft.; the infants' school-room, 64 ft. by 30 ft.; the babes' room, 30 ft. by 24 ft.; and two class-rooms, each 30 ft. by 23 ft. The girls' school-room is placed on the first floor, and is 62 ft. 9 in. by 22 ft. 9 in. with two class-rooms, each 24ft. 8 in. by 22 ft., and a third 25 ft. 5 in. by 22 ft. Separate entrances, with lavatories and cloak-rooms, are provided to each school; separate rooms are also provided for the use of the master and mistress in each school. The whole afforded accommodation for 320 boys, 280 girls, and 502 infants, making a total of 1,102. The playgrounds have been paved with tar paving, and have covered sheds for the protection of the children in wet weather, and the whole site is enclosed with a fence railing. The materials employed are of the simplest kind, the principal portion of the facings being of common red bricks. The heating apparatus for the school and class-rooms has been supplied by Messrs. Haden & Sons, and the works have been carried out by Messrs. Wilson & Son, under the direction of the architect, Mr. E. Holmes. The cost of the site, which consists of 5,000 yards, was 2,550*l.*; of the buildings, including a caretaker's house and architect's commission, 8,244*l.*; and of the furniture, 517*l.*; making the total expenditure 11,311*l.* The cost per head, exclusive of the site, is 7*l.* 19s.; and, including the site, 10*l.* 5s. 3½d.

STAINED GLASS.

Prestbury.—A memorial-window, the work of Messrs. Barlison & Grylls, of Newman-street, London, has been placed in the old parish church of Prestbury. It occupies a position over the doorway in the west gable of the recently-restored north aisle, and is of three lights, with a pointed head filled in with tracery of Perpendicular character. The central light contains a figure of the Saviour crowned with thorns and bearing His cross, the two Marys are represented as following, and in the rear is seen the door of the Prætorium. In the side light, on the left, the subject is Martha and Mary at the feet of Jesus, and the corresponding light on the right has a representation of the two Marys at the sepulchre. Each group of figures is surmounted by a canopy enriched with tabernacle work, and in the spandrels of the principal lights is an inscription.

Ramsgate.—Two stained-glass windows have been placed in the clearstory at St. George's Church, to the memory of the late Miss Sarah Rammell, by Mr. George Rammell and other members of her family. They represent St. George, the patron saint of the Church of England, and St. Alban, the first British martyr. They were executed by Messrs. Clayton & Bell, of London.

Pennfields. — A three-light stained-glass window has just been placed in the north transept of St. Philip's Church, Pennfields, near Wolverhampton, in memory of the Rev. Prebendary Dalton, who was vicar of that church for many years. The window is from the works of Mr. Samuel Evans, West Smethwick, Birmingham, and the subject treated is "Christ blessing little Children."

Miscellanea.

The Proposed Removal of the Mint.—At a sitting of the Select Committee to whom the City Lands (Thames Embankment) Bill was referred by the House of Commons, Mr. Shaw-Lefevre in the chair, Mr. Wollaston Blake, of the firm of James Watt & Co., Birmingham, —a director of the Bank of England,—gave evidence in support of maintaining the Mint in its present site. He saw no necessity for the removal to the site on the Thames Embankment, which would entail an expense of 480,000*l.*, of which 235,000*l.* would have to be paid to the Corporation of London for the land, 45,000*l.* for machinery, 50,000*l.* for interest of money for four years before the old site could be disposed of and the new building erected, 15,000*l.* for professional expenses, and 15,000*l.* for contingencies. Deducting 180,000*l.* for the old site would leave a net cost of 300,000*l.*, for which he saw no occasion. Mr. Bramwell, C.E., on the contrary, stated that none of the plans submitted to him were such as he could adopt, his dominant instruction from Government being that there must be no stoppage of the Mint. He thought no satisfactory alterations could be made at the present Mint without rebuilding it, which would take eighteen months or two years.

Society for Improving the Condition of the Labouring Classes.—The thirty-seventh annual meeting of this society was held last week at Willis's Rooms, the chair being occupied by the Earl of Shaftesbury, the president. The secretary read the annual report of the committee, from which it appeared that the houses of the society are in good repair. The society's annual summary of the deaths and their causes placed the rate of mortality throughout the houses at 20 per thousand. From the cash account, it appeared that the receipts from all sources during the year amounted to 5,788*l.* 5s. 2½d., which, with a balance in hand at the beginning of the year, made a total of 6,417*l.* 5s. 7½d. The total expenditure amounted to 5,947*l.*, leaving a cash balance of 470*l.*

Sculptures, St. Mark's, Venice.—Mr. G. Grove writes to urge that it would be a benefit to those who attempt to study St. Mark's, Venice, if a book were published containing a list of all the sculptures and mosaics of the church, with their inscriptions. "The list should begin from some definite point, and follow a regular order; should give the subject of the piece and the inscription thereon, with its decipherment, if necessary; and the known or probable date."

Lydd and Dungeness Railway.—The Government inspection of a new line of railway, which may probably develop at no distant date into a new route to the Continent, has just been completed. The new line accommodates a district which has hitherto lacked railway facilities. It branches off at the Appledore Station of the Rye and Hastings branch of the South-Eastern Railway,—85 miles from London,—and passes through or by the villages of Snargate, Brenzett, Old Romney, Mydley Chapel, and the ancient town of Lydd,—where there is a station,—to a point about one hundred yards north-east of Dungeness Lighthouse. The promontory of Dungeness is the nearest point on the English coast to the Continent, Cape Grisnez being distant not more than twenty miles. The length of the new line—which is designated as the Lydd and Dungeness Railway—is ten miles. The depth of water at Dungeness, even at low tide, is never less than 15 ft., so that vessels of the draught of the Holyhead packets can ride safely at almost a stone's throw from the beach. Whenever the Dungeness and Le Tréport route to the Continent is realised, it will be the shortest between London and Paris. The line, which has been constructed by Mr. Walker at a cost of less than 7,000*l.* per mile, will probably be opened for public traffic in the course of the month of July.

Messrs. Barnard, Bishop, and Barnards have sent us three of their Illustrated Price Lists, those namely of their "Carved Wood Mantel-pieces," "Plain and Art-Painted Tiles," and their "Low Combustion Stoves." This firm first got a name out of their own town by the excellent wrought-iron gates they sent to one of the Great Exhibitions, of which we gave an illustration at the time, and they have continued to maintain a good character for the art employed in their manufactures. The low combustion stoves, introduced by them, have found imitators. Their "art-painted tiles" are much better in design than many we have seen. In fact, as a rule, the productions of this firm are very satisfactory.

"Scientific Evidence."—Judge Hutton, of the Oldham County Court, appears to have a very poor opinion of the value of the evidence of experts, or as it is sometimes called, "scientific evidence." In a case that came before him last week, counsel expressed regret that scientific evidence was not adduced. Judge Hutton; —"Oh, no; I am very glad there is none. As Earl Cairns said in effect, these scientific witnesses cannot be indicted for perjury, and generally say what they are paid to say."

North Wales Slate Trade.—The depression in the slate trade still continues without prospect of improvement. At Lord Penrhyn's Carnarvonshire quarries the output is still limited to four days a week, and much distress prevails in the district. It is hoped that much of the surplus labour will be absorbed in the construction of the new line of railway connecting Bangor with Bethesda, which is about to be commenced. At the Llanberis quarries full time is still worked, but the staff of workmen has been reduced and the wages lowered.

International Sanitary Exhibition.—The arrangements for this Exhibition are now complete. The offices are removed from the Parkes Museum to the Exhibition buildings at South Kensington. The Right Hon. Earl Spencer, Lord President of the Council, has accepted the office of president, and will preside at the opening ceremony on Saturday, July 16th. The Exhibition is to be complete on Wednesday, July 13th, and the judges will make their examinations for the awards on the two days previously to the opening.

Great Strike of Nailers.—The whole of the wrought-nail makers of Blackheath, Rowley, Dudley, Sedgley, Gornal, Old Hill, and Bromsgrove, have ceased work, in consequence of their demand for an advance of 30 per cent. not having been granted. The operatives number 30,000 men and women. Mr. John Price, the Secretary of the Nail-makers' Association, says that the present rate of nailers' wages is about 47½ per cent. lower than in 1875.

The British Legation, Athens.—We understand that Mr. James Hill, of Upper Thames-street, has just shipped a considerable number of his improved locks and door-fittings to Athens, for the New British Legation Buildings; and, we believe, the order is the result of a former shipment to Athens for Dr. Schliemann, which gave both him and his architect great satisfaction.

Architecture, University College.—Mr. T. Roger Smith, F.R.I.B.A.:—

Construction, Second Series. Donaldson Silver Medal: A. W. Glasson, of London. Prize. T. R. Clemence, of London. *Second Class.* G. Havill, of London. *Third Class.* A. Gillespie, of Blackheath; H. W. Teed, of London; Charles Turner, of London. First Series. Prize. H. C. Clarke, of London. Certificate 2.° F. A. Gerrish, of London. *Second Class.* F. C. Nichols, of London; G. C. Nichols, of London. *Third Class.* John Briggs, of London; E. Crisp, of London; H. W. Parkinson, of London.—*Fine Art*, Second Series. Donaldson Silver Medal. A. B. Cottam, of Watford. Prize. A. W. Glasson, of London. *Second Class.* C. J. Tait, of London; K. Tatsuno, of Japan.—*Modern Practice.*—Prize. A. Ashbridge, of London. *Second Class.* C. H. Bedells, of Crouch End; W. J. Lander, of London; C. E. Pertwee, of London; A. B. Pite of London. *Third Class.* J. D. Butler, of London; W. Grellier, of London; W. A. Pite, of London.

The students in the first and second series were, this year, examined separately. Several of them passed creditably on both occasions; but, following the precedent of other years, the Council of the College have only granted to such students a certificate or prize for the more important of the two examinations. The award of the Donaldson medal was made by Professor Lewis; that of the other prizes was made by other architects familiar with examination, at the request of Mr. Roger Smith.

Croston.—The foundation-stones of a new Wesleyan chapel at Croston, near Ormskirk, have been laid. The new chapel will be built on the eastern side of Westhead-road, on a freehold site given by Mr. W. Woods, of Croston. The style will be Gothic. The walls will be built of Croston bricks, and all outside walls will have a 3-in. cavity. The front and sides will have Longridge stone base courses, cills, strings, buttress weatherings, and moulded labels round window and door arches. The whole of the internal woodwork will be of the best pitch-pine, twice varnished. The chapel will seat 300 persons. The plans have been prepared by Mr. S. Hurst, of the firm of Messrs. Maxwell, Tuke, & Hurst, architects, Southport, and the works will be carried out under the architect's personal superintendence. Mr. W. Vaughan, Southport, is the sole contractor. The entire cost will be about 1,200*l.*

Peckham.—The foundation-stone of the New Unitarian Chapel in Avondale-road, Peckham, was laid by Sir James C. Lawrence, bart., M.P., on the 23rd ult. The style adopted by the architect, Mr. Henry G. Brace, of Chancery-lane, is Early English, and the materials used externally will be red brick with stone dressings. The chapel will hold 250 persons on the floor-level, and 50 in the gallery. Internally, the facing will be of Luton brick, with red bands, and open timber roof. After the ceremony above recorded, the school-room, just completed in connexion with the chapel, was formally opened. The room is 33 ft. by 50 ft., with stock-brick facings, and red bands internally, with roof partly open. The builders of the chapel are Messrs. Hoare & Son, and of the school, Messrs. Watson & Dennett.

Jubilee of King's College.—At a meeting, held at Willis's Rooms on Midsummer Day, the Archbishop of Canterbury in the chair, it was resolved to commemorate the jubilee of King's College by the erection of suitable buildings in which to carry on the work of the institution in connexion with the higher education of women. Canon Barry, the Principal of the College, stated that the cost would be 20,000*l.*, of which sum more than 3,000*l.* has already been raised. An appeal is made to the public to support the scheme.

International Exhibition of Machinery and Tools at Liege.—Readers will find in our advertising columns notice of an International Congress of Contractors, which is to be held in Liège on the 24th, 25th, and 26th of July. In connexion with the Congress there is to be an exhibition of machinery, engines, tools, and building materials, which will remain open until the 31st of August. We invite attention to the particulars given, as we have reason to believe that the enterprise is undertaken with the most satisfactory auspices.

New Infirmary, Shoreham.—The Steyning Union Rural Sanitary Authority are about to erect a new infirmary in two blocks, for male and female patients, at the workhouse, Shoreham, Sussex. The works will be carried out under the superintendence of Mr. S. Johns, district surveyor, Portslade.

Painters' Wages at Oldham.—The Oldham painters have returned to work on the old terms, after having struck for an advance of one half-penny per hour.

Sculpture.—The Corporation of the City of London have commissioned Mr. C. B. Birch, A.R.A., to execute a marble bust of the late Earl Russell to be placed in the Guildhall. The Council of the Sydney International Exhibition have awarded to Mr. Birch the first medal and diploma for his bronze group "Retaliation," which has been purchased for the Sydney National Gallery.

TENDERS

For construction of Main Drainage and Outfall Works at Leyland, Lancashire, for the Leyland Local Board. Mr. Wm. Wrennall, engineer:—

Isaac Auwell, Liverpool	£6,907	8	1
George Bell, Gateshead	6,651	18	6
George Smith & Co., Southport	6,604	5	0
James Cardwell, Blackpool	6,453	16	3½
Wm. Pollitt, Bolton	6,300	0	0
Robert Pitt, Liverpool	6,029	19	6
Chas. Harris & Wm. Jenkins, Great Harwood and Blackburn	5,835	19	11½
Wm. Taylor & Sons, Higher Walton, Preston	5,759	17	6
George Hunter, Colchester	5,669	19	6
John Dovenor & Son, Stoke-on-Trent	5,625	7	5
Fawkes Bros., Birkdale	5,619	9	6
John Jowett, Brighouse	5,547	8	2½
Frank Dawson, Bury	5,488	10	0
Henry Hodkinson, Westhoughton	5,321	11	8
S. W. Pilling & Co., Manchester	5,258	7	1
James Jenson, Preston	5,215	7	0
Peter Walkden & Co., Liverpool	5,200	0	0
Wm. Winnard, Wigan	5,000	0	0
Bickerstaffe & Crombleholme, Preston	4,984	0	0
Taylor & Duckworth, Manchester	4,979	0	0
G. S. Boaz & Co., Liverpool	4,919	13	6
Robert Jeffreys, Colwyn	4,879	11	4½
Samuel Cowburn, Hindley	4,768	8	0
G. G. Rayner, Bootle	4,685	0	0
John Walmsley, Preston	4,550	0	0
G. & J. Foote, Elton, Bury	4,319	7	8
Wm. Cunliffe, Leigh (accepted)	4,308	10	0

For new boundary-wall and other works at the Casual Wards, in Macklin-street, Drury-lane, for the Guardians of the Poor of the Parishes of St. Giles-in-the-Fields and St. George, Bloomsbury. Mr. G. Wallace, surveyor:—

Riches	£467 0 0
White	438 0 0
Ward	436 0 0
Axford	411 0 0
Lucas	389 0 0
Fotheringham	383 0 0
Watson	379 0 0
Morris	371 0 0
Clarke	369 0 0
Scott	359 0 0
Eldridge	358 0 0
Nightingale	334 0 0
Cross	326 0 0
Killingback (accepted)	320 0 0

For additions to schools at St. Helen's-street, Chesterfield, for the Chesterfield School Board. Mr. C. W. Rollinson, architect:—

Powell	£1,453 0 0
Forrest	1,380 0 0
Fidler	1,305 0 0
Chadwick & Co.	1,234 0 0
Rollinson	1,224 0 0
Wright, Chesterfield (accepted)	1,197 0 0
Margereson	1,194 0 0

For additions to schools at Hipper-street, Chesterfield, for the Chesterfield School Board. Mr. C. W. Rollinson, architect:—

Powell	£1,541 0 0
Brailsford	1,445 0 0
Hoole	1,411 0 0
Chadwick & Co.	1,370 0 0
F. Glossop	1,350 0 0
Gough	1,314 0 0
Forrest	1,303 0 0
Fidler	1,299 0 0
Rollinson	1,287 0 0
Heathcote & Son	1,249 0 0
Margereson	1,237 0 0
Roe, Alfreton (accepted)	1,217 0 0

For offices in Throgmorton-avenue, City, for Mr. Chas. Sanderson. Mr. Fred. Chancellor, architect. Quantities prepared by Messrs. Curtis & Sons:—

Brown	£10,427 0 0
E. Conder	10,394 0 0
Morter	10,300 0 0
Holland & Hannen	9,794 0 0
Nightingale	9,787 0 0
Brass (accepted)	9,676 0 0

For rebuilding the Congregational Church, Limba Magna. Mr. John R. Chamberlain, architect. Quantities by Mr. Hoffman Wood:—

Taylor & Son	£2,930 0 0
Walker & Boyne	2,925 10 0
Alf. Ward & Sons	2,917 0 0
Johnson & White	2,905 0 0
Thornton & Hill*	2,137 0 0

* An error of 800*l.* has been committed in making tender, and Messrs. Thornton & Hill decline to abide by their tender.

For repairs and re-decoration of Clapton Park Chapel, High-road, Lower Clapton.
Barber, Sons, & Lutwyche (accepted).

For alterations to shops in Spa-road and Jamaica-road Mr. H. J. Hansom, architect:—
Stephens £687 0 0

For building a mortuary and disinfecting oven, except ironwork, at Walthamstow. Mr. George B. Jerram, C.E., surveyor:—

Fuller, Walthamstow	£139 0 0
Probert, Walthamstow	125 0 0
Barton, Walthamstow	98 0 0
Good, Walthamstow (accepted)	90 0 0

For sewers, Walthamstow. Mr. George B. Jerram, engineer. Quantities by Messrs. Hovenden, Heath, & Berridge:—

Contract No. 11.

	12-in.			Pipes.*		
Stubbs	£1,348	0	0	£73	0	0
T. Adams	1,338	9	9	80	3	6
J. Simmons	1,372	6	10	68	4	6
Porter	1,316	8	11	39	10	0
Rutty	1,211	2	6	60	0	2
Wilkes & Co.	1,276	10	1	34	11	3
Hunter	1,066	11	3	38	17	0
Botterill	1,093	0	0	43	0	0
Acock	1,089	17	0	38	16	0
McKenzie	1,004	9	0	48	0	0
Neave	1,030	5	4	20	9	0
J. Bloomfield	1,009	0	0	54	0	0
L. Bell	1,007	0	0	43	11	3
Dewitt	983	0	0	42	18	9
Good	978	10	6	48	16	6
Stevenson	918	0	0	37	0	0
Ford & Everitt	889	0	0	50	0	0
Palmer	899	2	0	37	6	11
Carrall & Co.†	849	16	6	36	16	5
Reeves	1,479	2	11½	23	7	2
Jesse Jackson	1,322	0	0	58	0	0
Strachan	949	11	4	68	1	3

* Deduct if 12-in. pipes are used instead of 15-in.
† Accepted subject to usual conditions.

	Contract No. 12.			Contract No. 13.		
Stubbs	£5,876	0	0	£4,272	0	0
T. Adams	5,256	18	2½	3,934	19	8½
J. Simmons	5,191	18	2	3,928	8	3
Porter	5,304	14	3½	3,534	19	5
Rutty	5,052	6	4	3,910	7	4
Wilkes & Co.	4,958	10	5	3,693	1	11
Hunter	4,518	1	0	3,488	6	4
Botterill	4,625	0	0	3,376	0	0
Acock	4,338	8	3	3,340	14	10
McKenzie	4,378	0	0	3,067	0	0
Neave	4,074	2	10	3,227	11	11
J. Bloomfield	4,238	0	0	3,100	0	0
L. Bell	4,124	0	0	3,098	16	3
Dewitt	4,072	0	0	3,185	0	0
Good	4,251	16	0	2,970	10	0
Stevenson	3,695	0	0	2,697	0	0
Ford & Everitt	3,808	0	0	2,655	0	0
Palmer	3,847	10	9*	2,855	5	9
Carrall & Co.	3,525	0	0	2,595	10	0*

* Accepted subject to usual conditions.

For alterations and repairs at the Shernhall-street Schools, for the Walthamstow School Board. Mr. W. A. Longmore, architect Quantities supplied:—

J. J. Scott	£1,446 0 0
Good	1,261 11 3
Jullier & Co.	1,195 0 0
Lusk	1,195 0 0
Bentley	1,142 0 0
Cross	1,136 0 0
Read	1,080 0 0
Palmer	1,050 0 0

For the erection of four houses, Robert-street, North Woolwich. Mr. C. A. Legg, architect. Quantities supplied:—

Wood & Heap	£1,590 0 0
J. Parish	1,377 0 0
G. Lusk	1,300 0 0
A. Judd	1,232 0 0
Roper & Hawker	1,175 0 0
Banner	1,027 13 0

For additions to Messrs. Barker's premises, High-street, Kensington. Mr. Josiah Houle, architect:—
Bowles (accepted) £5,721 0 0

For pulling down and re-building Nos. 48 and 49, Tabernacle-walk, Finsbury, for Mr. W. Waller. Messrs. Borer & Dobb, architects. No quantities:—

Allen	£2,150 0 0
Johnson	1,993 0 0
Sabey	1,929 0 0
Staines & Son	1,782 0 0

For alterations and additions, Western-road, Brighton for Messrs. Chipperfield & Butler. Messrs. Lainson & Son, architects:—

Nash & Co.	£2,937 0 0
Lockyer	2,933 0 0
Cheeseman & Co.	2,880 0 0
Garratt Bros.	2,837 0 0
J. Barnes (accepted)	2,474 0 0

For completion of works at Brighton New Club. Messrs Lainson & Son, architects:—
Cheeseman & Co. (accepted) £1,278 0 0

For repairing and painting works at No. 101, Newgate-street. Mr. H. S. Legg, architect:—

Hayward & Son	£140 0 0
Geo. Shaw	136 10 0
Pitman & Son	120 0 0
Pitcher & Co. (accepted)	112 0 0

For repairs to schools and almshouses, Schoolhouse lane, Ratcliffe, for the Coopers' Company. Mr. G. Barnes Williams, architect:—

Little	£1,195 0 0
Ashby & Horner	820 0 0
Cook Bros.	785 0 0
Wood	725 0 0
Johnson	693 0 0

For the erection of a villa residence in Willesden-lane, Brondesbury, for Mr. John Winckworth. Mr. H. H. Bridgman, architect. Quantities by Mr. F. Thomson:—
H. Haynes, Alperton (accepted).

For rebuilding the boundary-wall of South Grove House, abutting on the Highgate Cemetery, for the Baroness Burdett-Coutts. Mr. H. H. Bridgman, architect:—
Southcott & Co. (accepted).

For a new drinking-fountain at St. Stephen's Schools, Westminster, for the Baroness Burdett-Coutts. Mr. H. H. Bridgman, architect:—
A. Bradford, Kennington (accepted).

For repairs and alterations to cottages on the Waterdell Estate, Watford, for the Rev. W. D. Morrice. Messrs. Sedgwick, Son, & Weall, architects:—

Turner, Watford	£625	0	0
Neal, Watford	609	0	0
Waterman, Watford	558	0	0
Miskin, St. Alban's (accepted)	547	0	0

For new stables and open sheds, &c., at Moor Pasture, Great Wratting, Suffolk, for the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick, Son, & Weall, architects:—

Mason & Son, Haverhill (accepted). £543 0 0

For new cottage, stables, &c., at Waterdell Farm, Watford, for the Rev. W. D. Morrice. Messrs. Sedgwick, Son, & Weall, architects:—

Miskin, St. Alban's	£845	0	0
Turner, Watford (accepted)	815	0	0

For repairs to Manor Farm House, Ruislip, Middlesex, for the Provost and Scholars of King's College, Cambridge. Messrs. Sedgwick, Son, & Weall, architects:—

Brown, Harefield (accepted) £138 0 0

For repairs to farm buildings at Waterdell Farm, Watford, for the Rev. W. D. Morrice. Messrs. Sedgwick, Son, & Weall, architects:—

Neal, Watford	£420	0	0
Southcott, Highgate	377	0	0
Chadwick, Watford	343	0	0
Miskin, St. Alban's	280	0	0
Turner, Watford (accepted)	280	0	0

For new buildings at the Old Malting-yard, Great Wratting, Suffolk, for the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick, Son, & Weall, architects:—

Cadge, Hartest	£543	11	0
Mason & Son, Haverhill (accepted)	497	10	0

For new house at Waterdell Farm, Watford, for the Rev. W. D. Morrice. Messrs. Sedgwick, Son, & Weall, architects:—

Miskin, St. Alban's	£1,278	0	0
Waterman, Watford	1,228	0	0
Neal, Watford	1,115	0	0
Turner, Watford (accepted)	1,097	0	0

For various works at Sowley Green and Wadgells and Harlica Farms, Great Thurlow, Suffolk, for the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick, Son, & Weall, architects:—

Mason & Son, Haverhill (accepted) ... £140 10 0

For new farm buildings at the Wood Farm, Gaddesden, Herts, for Mr. T. F. Halsey, M.P. Messrs. Sedgwick, Son, & Weall, architects:—

	If Roofs Tiled,	If Roofs Slated,
Cook Bros., Berkhamsted	£1,330 ...	Deduct £35
J. Sear, Hemel Hempstead	1,125 ...	Add 10s. per square.
C. Miskin, St. Alban's	1,120 ...	Deduct £100
T. Turner, Watford*	997 ...	Deduct £70

* Accepted.

For house, South Audley-street, for Mr. Nicholson, M.P. Mr. Crickmay, architect. Quantities by Messrs. Nixon & Raven:—

McLachlan & Sons (accepted).

Accepted for altering the Mitre Inn, Wakefield, Mr. William Watson, architect:—

Excavating, Brick, and Stone Work.

Flower Bros	£160	0	0

Carpenters' and Joiners' Work.

Craven & Lloyd	97	9	0

Plumbing, Glazing, and Ironwork.

S. & F. Drake	79	4	0

Plastering Work.

T. C. Tattersall	18	19	4

Accepted for enlarging the Infirmary at the Union Workhouse, Wakefield, Mr. William Watson, architect:—

Excavating, Brick, and Stone Work.

Bagnall Bros	£480	0	0

Slating Work.

C. F. Rycroft	46	10	0

Plastering Work.

Chas. Driver	44	0	0

Plumbing, Glazing, Ironwork, and Gasfitting.

Wm. Thresh	360	10	0

Carpenters' and Joiners' Work.

J. & J. Mountain	359	10	0

Painting Work.

George Powell	26	10	0

For rebuilding the Blue Posts Hotel, Cork-street, Bond-street, for Mr. Schlette. Mr. Tyler, architect. Quantities by Messrs. Stonor & Sons:—

Brass	£10,293	0	0
Conder	9,900	0	0
Ashby Bros.	9,849	0	0
Simpson	9,660	0	0
Bywaters	9,485	0	0
McLachlan & Sons	8,340	0	0

For new villa residences at Shoot-up-hill, Kilburn, for Mr. Deighton. Mr. Douns, architect. Quantities by Messrs. Widnell & Trollope:—

Perry & Co.	£8,540	0	0
Yerbey & Duncan	8,537	0	0
McLachlan & Sons	8,194	0	0
Patman & Fotheringham	8,473	0	0
Wall Bros.	8,472	0	0
Mark Manley	8,377	0	0
King	7,995	0	0
Scrivener & Co.	7,913	0	0
McCowan	7,440	0	0

For 363 yards of 20-inch by 16-inch egg-shaped outfall sewer and filter-bed, at Spital, near Chesterfield, for the Chesterfield Rural Sanitary Authority. Mr. R. Butterworth, surveyor:—

Robert Holmes, Shirland	£360	0	0
Bunting & Littlewood, Eckington	349	4	6
Joseph Cropper, Brimington	324	0	0
Froggatt, Newbold	312	15	0
Breedon & Spencer, Wessington	300	0	0
French & Shepherd, Apperknowle	299	10	0
Marsden & Clark, Heeppbridge	281	11	3
Rodgers & Wingad, Whittington*	281	0	0

* Accepted.

TO CORRESPONDENTS.

D. W.—R. B.—H. F. B.—E. W. H.—N. McD.—F.—E. W.—R. T.—J. J.—J. H.—P. W.—J. W. C. W. R.—A. S. J. T. G.—H. G.—C. B. B.—W.—F. C.—J. W. S.—D. R. & Co.—J. R. & Son.—E. & H.—F. & Son.—S. & Son.—R. G.—S. & H.—F. F.—G. B. J.—D. C.—H. C. (we don't know of any).—R. F. (Free, Stationers' Hall-court, will not be interfered with).—D. B. (shall appear early).—T. H. G. (next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

N.B.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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Manufacturers of
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COLLINGE'S PATENT HINGES, LEVER, SCREW, & BARREL BOLTS,
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The Builder.

VOL. XLI. No. 2005. SATURDAY, JULY 9, 1881.

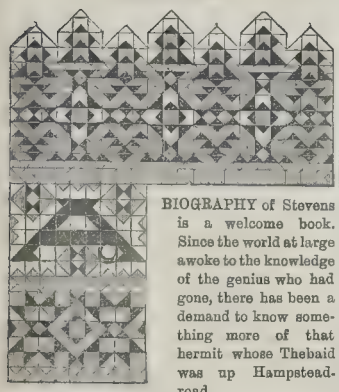
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Alfred Stevens.



BIOGRAPHY of Stevens is a welcome book. Since the world at large awoke to the knowledge of the genius who had gone, there has been a demand to know something more of that hermit whose Thebaid was up Hampstead-road.

We have heard of one being in course of preparation by one of his pupils; and trust soon to have such a work as shall give the man's inner life, show the methods in which he worked, the steps by which he rose; and, for the instruction of those coming after, shall multiply and perpetuate a representative series of instances of his marvellous mastery in art.

We believe the public is indebted to Mr. J. Comyns Carr, the spirited English correspondent of *L'Art*, for the idea of publishing some illustrations showing this, with an accompanying narrative, in that journal. This account, by Mr. Walter Armstrong,* appears to have been collected from various notices in the public papers, from ourselves among the number, without any acknowledgment of the fact. It would be interesting to know how much intercourse he had with the subject of this study, as some statements in the book could scarcely have been written by one who had possessed the advantage of knowing Stevens intimately.

The present work reproduces nearly all the illustrations which appeared in *L'Art*; the letterpress is rather more than a mere translation from the French account [though in the absence of any preface we do not gather which was written first], as the division of paragraphs is altered; several of the errors in the latter are here corrected, and the details are also fuller in many instances; but there are traces of the *feuilleton* style, and a tendency to present facts in a picturesque light, which detract from its value as history.

A book on such a subject is unusual here, though common enough on the Continent; and we owe a debt to the foreigners for their ungrudging appreciation of our great artist. The publication is so admirable in intention and in so good a vein, that we hesitate to find fault; and yet there are several points to which we must draw attention, in the hope that, whenever another edition appears, with a memoir written with more knowledge of the man, these may be corrected.

The value of the work is further marred by careless editing: there is no division into chapters, the subjects are not treated of in chronological or any other order that we can discover, dates are omitted where they would be useful, and there is no index to subject or to illustrations. The paragraphing and punctuation do not conduce to easy reading; and the typographical errors on pp. 2, 19, 22, and the mis-spelling on pp. 27, 42, and 47, are not creditable to the publishers. We would remind the writer that the Italian names he uses are spelled *Buonarroti* and *Correggio*; and that the church at Venice is dedicated to *Santi* Giovanni e Paolo; also that *cognoscenti*, *ensemble*, and *verve* are still considered as foreign words, and treated as he treats "*chefs-d'œuvre*." The possessive case is clumsily put twice on p. 11, and the expression on p. 15,—that the money provided for the Wellington Monument "happily proved to be less than a just equivalent for what the nation received,"—is an odd way of putting the case. Perhaps it is meant,—that the nation happily received far more than a just equivalent for the money,—which is another proposition entirely. We also think that "became saturated" would be in better form than "saturated himself" in p. 4; and perhaps there is an s too many in the last line but two of the book; and "Lady Ashburnham" on p. 21 should be "Louisa Lady Ashburton."

The illustrations are the principal feature of the book: those by R. W. Macbeth and Ch. E. Wilson are very good, also some of those by J. Watkins. They are neither inserted in any relation to the descriptive letter-press nor numbered; and hence reference is difficult. The titles have remnants of French on pp. 2, 3, 20, and 31; and are also incomplete, for, while giving due prominence to the name of the draughtsman in all cases, they do not always state whether they are from the model, from the executed object, or from a drawing by the master himself; and evidently the words "Portion of" should be added on p. 41.

The Study deals with certain incidents and works of Stevens's life. We leave the reading of these in detail to our readers, and proceed to note only some of the incomplete statements.

Mr. Armstrong mentions Stevens's subtlety in the management of light-and-shade, in making some drawings on stone for lithographs to illustrate Professor Cockerell's monograph of the Angel Choir at Lincoln; but he seems not to have been aware of a far finer instance of this power in the lithograph Stevens made of the sculpture in the pediment of St. George's Hall, at Liverpool. The preliminary drawing in Indian ink is, we believe, among the treasures of the South Kensington Museum, but we have seen a copy of the lithograph in the Library of the Royal Institute of British Architects. In the title to this, which mentions everybody all round, the one name of Stevens himself, conspicuous by its former absence, has been added in pencil by a later hand; this keeping in the background was one reason of his want of worldly success. The sculpture, as it was designed by Cockerell and carved by a contemporary sculptor, left a blank space at each end of the tympanum, perhaps from the difficulty of designing figures for spaces so confined; but Stevens in making the drawing supplied the two figures at each end. These had the cordial approval of the Professor, and it is hard to imagine the effect without them now. We commend this lithograph to the notice of our readers, and would ask,—how many of our leading architects could make such a design and such a drawing?

As might be imagined, an account of the Wellington Monument in St. Paul's Cathedral, with all its sad concomitant mistakes and troubles, occupies a large part of the biography. The writer does not tell the tale, perhaps because he did not know it, of the days when Stevens, with his assistant, Mr. William Ellis, now of Sheffield, worked on the competition for the Government offices and the monument; how when the last day for sending in the latter arrived, as ill-luck happened, it was a general holiday; and, as no arrangement for a van to take it had been made, Ellis spent the whole day, till late in the evening, hunting about for one. At length one was found, planks were placed from the window-cill to the area railing the van was backed on the footpath, and the model was slid down in three pieces. Then Ellis accompanied it, and arrived at Westminster Hall at three minutes before midnight. Springing down, he gathered together a few workmen and porters who were coming away, and dragged in that model which was to lead to Stevens's fame, and give to England the supremacy in Art, just as the bells were striking the close of the day. This procrastination was a failing which has descended, along with greater or smaller portions of his mantle, to some of his pupils.

The design, which we have illustrated and described (vol. xxxiii., p. 686), was much criticised at the time, so different was it to the usual "Sculptor's Monument." The recipe for outdoor monuments appeared to be blocks of granite with figures at the angles; while our indoor ones, with dying heroes, groggy Neptunes, and dyspeptic lions, are scarcely much better; and all will be glad that an opportunity was given to a complete artist to show how a great monument may be treated. We have borne witness to its admirable design (vol. xxviii., p. 637), in our columns.

With regard to the *motif* or prototype of the design, there is, however, a word to say. The writer states, "the favourite reference is to an altar-tomb in the choir of San [*sic in orig.*] Giovanni e Paolo at Venice," and he describes a tomb which "consists of a sarcophagus supporting a recumbent figure and surmounted by a

* Alfred Stevens. A biographical study. By Walter Armstrong. Remington, New Bond-street. 1881.

canopy," &c., and he then proceeds to say "there is an appreciable similarity in their minor architectural details, but there all resemblance ends." We were the first to make the suggestion (vol. xxxiii., p. 405), since adopted by others, about this *motif*,—we mentioned "the *high altar*," he alludes to *an* "altar in the choir,"—and he shows he has mistaken the monument by his description, given above, which tallies with the Vendramin monument (illustrated in Yriarte's book on Venice a short time ago). The altar, to which we referred, and described as the work of Carmero, dated 1610, *has no sarcophagus and no recumbent figure!* The date should have shown that the work of Leopardi could not be intended; but it is dangerous to prophesy unless you know. A nearer copy of the Venetian work is to be seen in Mr. Gribble's design for the Baldacchino in the new Oratory at Brompton. If Mr. Gribble could favour us with his measured drawings from the original, our readers could judge for themselves.

In speaking about the position of the monument, the writer says, justly enough, that Stevens did not disapprove of it; but we in common with others have regretted it (p. 456, In vol. xxxvi.), and do so still If the wooden screen which separates the court from the south aisle of the cathedral could be reduced by taking away the pediment and the four centre columns, the effect from the nave, which is where the spectator must stand in order to judge of the proportions, would be much improved. We might express a hope that this should be done; but we understand that when the Royal Institute of British Architects visited St. Paul's, at the time of the Conference four years ago, and the president, Mr. Charles Barry, asked a question about it, the answer was not encouraging. As it is, the dark wooden pediment, &c., cuts the design into two parts in a manner which must be regarded as most unfortunate.

Exception is taken to the head of the figure of "Truth." His pupil Stannus, who was employed to finish the few remaining details of the work at his decease, would certainly not touch so important a part as the head of this figure, even had it been left rough; but it was *complete*, as we now see it in the model at the South Kensington Museum, and, indeed, looked at as a representation of the simplicity and ingenuousness of Truth, without any distorting emotions, it has a nobleness and an appropriateness of expression which make it worthy to be placed by the side of the sister group, and, perhaps, of any other group in the world.

We note Mr. Armstrong's appeal for the completion of the work: we understand the model of the equestrian statue of the Duke, rough as it is, is carefully preserved, and could be available. We have all along said it would be better to take it as it is than to invent another finish of a different idea. In this we are supported by Mr. Fergusson, to whom, it should be more generally known, was due the "happy thought" of getting back Stevens to finish the work through Mr. Collmann. Mr. Fergusson also contributed towards the completion by the weight of his approval, and by the sacrifice of his time in a manner which will not be appreciated till the whole history is written; and he has earned a right to speak on this subject. In his letter to the *Times* of June 26th, 1878, he said he had reason to believe that the late Dean Milman's objection was not shared by the present Dean and Chapter; and he pleaded that "The Horse and his Rider" might be placed on the "gorgeous elaborate pedestal for a statue which is still wanting." As long ago as 1876 Mr. Comyns Carr made an eloquent appeal to the same effect; and a memorial signed by many artists was presented to the then First Commissioner of Works, but without effect, as it turns out; and, as a change was made in the office shortly afterwards, it is possible that it was forgotten. We hope, when the Government have a little leisure, that it may be able to consider this, and to spare the 2,500*l.* necessary to complete what will be then "the finest sepulchral monument of any age."

In the recital of the subsequent business, when the commission was given, there is a straining after effect in the statement that the Government sent for his signature an *agreement* which bound him to complete the work for 11,000*l.* No agreement was sent, but in a letter of the 9th of September, 1853, he was authorised to proceed on a condition that it should be done for that amount; the letter, however, contained this important statement that, excepting that the monument was to be in accordance with surrounding architecture to the approval of Mr. Penrose, he was left "entirely unfettered as to the composition of the design." The writer does not quote this, though it entirely qualifies the whole transaction, and shows that Stevens was at liberty to have simplified the first design or make another more suitable to the reduced amount. It is quite possible to imagine that a simpler design, still showing all the grand excellencies of the present monument, could and would have been made by Stevens had he then realised the sad and bitter experience he afterwards possessed.

What followed is traced with more or less accuracy and detail; but as the public has heard enough about it, we will only allude to one point—the conduct of Mr. Ayrton. It became fashionable for a certain set of writers to launch their shafts at this gentleman; and, of course, he is made to come in for some heavy blame for his treatment of Stevens. But after all is said, it may be urged that the artist's mode of procedure, after he recommenced work upon the monument under his contract with Mr. Collmann, was the best justification of Mr. Ayrton's measures. The latter may have been arbitrary in manner; but some allowance will be made when the fact is considered that Stevens had been engaged for eleven years, and none of the models for the sculptor's work were ready, and the whole thing had become a standing joke in the House of Commons. When Stevens realised that thereafter payment would be made not on promises but on work done and actually delivered, he finished the various parts; and at the time of his decease had completed nearly everything: so whatever may have been Mr. Ayrton's shortcomings as to manner, the fact remains that through this act, or as a result of it, the work was really completed before Stevens's death; and it may be doubted whether it ever would have been except under similar pressure.

The question is asked on p. 37, "Was Mr. Ayrton's conduct judicious and to the benefit of the public service?" with the answer, "We declare most emphatically it was not." Perhaps the *result* is the best test; we admit all that can be said about genius, and we all along pleaded for consideration in Stevens's case, but the line must be drawn somewhere.

Mr. Armstrong airily says Mr. Ayrton looked into the state of things at Stevens's first request for money [which came before him], and ordered the experts of his department to make a survey and report, and upon that report he determined that "such a state of things could not be suffered to exist for another day"; that he demanded the surrender of the models, &c., which were "boarded up and sealed," and he also re-quotes the epigrammatic "short way with artists." The whole of this is somewhat misleading,—unintentionally, no doubt; but let us look at the dates. In September, 1869, Mr. Stevens applied for a further sum on account, which was paid. On April 9th, 1870, *i.e.*, seven months afterwards, Mr. Ayrton inspected the works, and being dissatisfied, he ordered the survey, which was duly made, and dated May 31st. The letter which determined the contract and required possession of the models, &c., was sent on July 20th, and, after much rather one-sided correspondence, including a letter dated August 2nd from the Office of Works, to which Mr. Stevens only sent a reply on October 25th, after five requests for one, the models, &c., were delivered upon the 14th of November,—*i.e.*, another seven months from Mr. Ayrton's visit, or fourteen months after the request. The expression "not for another day" does not compare favourably with these facts. An enclosure, with door and padlock merely, was certainly fixed up at one end of the large studio; but as it was only 6 ft. or 7 ft. high, it is obvious that Mr. Ayrton trusted more to Mr. Stevens's honour than to "seals."

We have no sympathy with high-handed acts by any one; but to make Mr. Ayrton the scapegoat, and to repeat the insinuation about motives for his appointment, are scarcely worthy of the rest of the book. The fact is,—and be it sorrowfully stated,—that the fastidiousness of the artist must have blunted his sense of obligation. Promises seemed of no moment; and those who knew him best made their calculations and applied pressure accordingly. We know of one gentleman to whom he had promised, after much procrastination, to have some work really ready "in three days," who waited for a month, and then sent a porter every day with instructions to wait for it. Stevens's answer to the porter on the first two days was that the painting "was wet and it could not be rolled up," when it had not been commenced! The daily visits, however, resulted in the porter bringing the long-desired work home in triumph on the eighth. One of his pupils, to whom he had promised a spare duplicate cast, "the next time he came," called three times, and on each occasion was put off till the "next time": on the fourth visit a Hansom cab was engaged in the neighbourhood and drawn up before the window to show the master his word was relied on. This piece of mute eloquence produced the desired result. Again, we hear of a wealthy patron, who had paid him for some work and could not get it out of his hands, having to resort to a lawyer's letter (kindly intended, however), to spur on Stevens to let the work go, for the patron knew that its non-delivery was due, not to indolence, but to that excessive fastidiousness which it was thus hoped to overcome. His neglect to proceed with the execution of the bronze doors for the Jermyn-street Museum, for which we are told, on p. 11, he had received the commission and a small payment on account; and his procrastination in the matter of a diploma for the 1867 Exhibition, both resulted in loss:—to him of the commissions, and to the world of two fine works. These are cases out of numbers: perhaps similar anecdotes could be related of other great geniuses; and these are given, not to damage Stevens's character, but to show that at Mr. Ayrton's advent, the Office of Works had begun to understand the man they had to deal with.

In connexion with this episode the silly story about Mr. Ayrton's likeness is reproduced. This, if correct, would only show ridiculous spite on the part of Stevens, which was foreign to his nature; but we can say that the fact is otherwise, as, indeed, any one may see on examining the work at St. Paul's.

One of Stevens's most munificent patrons was Mr. R. S. Holford, of Dorchester House, Park-lane, to the magnificence of whose palace Stevens, among others, contributed. Illustrations are given from some of the works executed for him; but there is no attempt at any account of their evolution or of the relations between the two men. The dining-room mantel-piece is the subject of three illustrations on p. 10, and on pp. 6 and 7. These show the unsightly block intended to range below the lower fascia of the architrave, which might have been left large in the marble for protection of the arrisses, but certainly now requires reduction in the projection, as may be seen in the model at South Kensington Museum, where the works of Stevens may be conveniently studied.

Stevens's design for the decoration of the dome of St. Paul's is described, and reference is made on p. 27 to "our illustration," as showing one bay of the design. We fail to find the illustration. It is a matter for congratulation that this model has been acquired by the Dean and Chapter, instead of falling into private hands. A full-size experimental cartoon is being worked out from it by Mr. E. J. Poynter, R.A., and Mr. Stannus, while Sir F. Leighton, P.R.A., assists with his judgment and is painting a composition for one of the circular panels. We understand, from what has passed, that "the curiously built-up rib," to which the writer refers, is to be somewhat modified; and we hope that when tried up next spring the result will be satisfactory, and such as will tend to the worthy adornment of our only Classic cathedral. We do not, however, commit ourselves to the expression of any opinion as to its fitness, at the present moment.

No mention is made in the book of Stevens's great admiration for and study of Flaxman in his earlier days; yet this was one of the elements in his art education. There was much in common between the two minds. Flaxman appears to have sunk into forgetfulness of late years in England, but in France he is considered and studied as the representative English sculptor, probably for the beauty of his line composition.

We are informed in the book that what is there termed "the constructive inferiority" of Gothic was displeasing to Stevens; and that he used to say that "as the round arch is the strongest method of bridging over a space, a pointed one must be a lie. . . . ." We do not gather from the history who it is that used the term "constructive inferiority"; if it were Stevens, and if he really did ever make the second remark which has been told to the compiler, they could only be instances of narrow

one-sided dogmatism, with which we learn from p. 45, he had no sympathy, and unworthy either of the man or of repetition in the book.

We also think the statement on p. 26, that he felt slighted because Mr. G. F. Watts, R.A., was asked to prepare a design for one of the spandrel panels in the dome of St. Paul's where his Isaiah was up, is scarcely kind to his memory; and we question its accuracy. We have it on the authority of one of his more intimate pupils that he had more generous feeling towards brother artists, that he always spoke of Watts and his work with appreciation, and that he regretted that Watts had not (like himself) made a full-size cartoon instead of leaving the enlargement and re-drawing to workmen.

The estimate of his art is sympathetic and penetrating; it well says:—"Stevens was a man born out of due time, a man who, in the wrong country and the wrong century, amid many discouragements and with but little help from public sympathy, carried to perfection a work left incomplete by the Italians of 300 years before." This work, we take it, was the welding together of the dissevered arts which, in the age of specialists and the "Division of Labour," had become separate, with such lamentable results in each. An Architect is all the better and truer an architect if he have practical knowledge of sculpture; a Sculptor is stronger by reason of such curb as the chief-art brings; while each is richer by the union of their sisters, Painting and Ornament: when a man unites these in a degree like Stevens, he becomes one of those to whom "Giotto will give his hand, and lead into the white circle, and say, 'This is our brother.'" Much has been said by critics about originality, meaning probably novelty; there is a kind of novelty pleasing to lesser minds, which remains so because the greater pass it by. Great minds work along the lines of development, widening and deepening the current: lesser ones start on erratic courses, leading to eddies on one side or stagnation on the other, and are left behind and forgotten, while the greater ones help onward the tradition from age to age. It is too soon yet, we hold, to assess Stevens's position; but, when people are shaken down to their proper levels, we believe his name will be prominent in the great pedigree of art.

The account of Stevens's later days and death forms one of the saddest pages in the life of this talented man, though it is not dealt with in the Biography: with hair growing grey, and the unmistakeable traces of premature age upon his beautiful Classic face like Keats' he struggled on, working on the group of "Truth and Falsehood," which he did not live to finish,—compelled to take rests by that illness he tried to disregard,—and yet building up and bringing forward, simultaneously, the model of that equestrian statue which had been objected to, and was not ordered; receiving the visits of those who enjoyed his friendship with a weariness of manner even as he made them welcome, and, inquiring about their various work, gave invaluable help in the kindly and modest manner which made him beloved by them. The time went on, he being more at ease after the financial burden had been taken off his back by his kind-hearted friend, Mr. Collmann, since gone to his rest also; and all were in hopes of his "pulling through," getting the work done, and then reaping the reward which the English public, though it grumbles, would have given,—when they were startled by the news of his death, and read the pathetic extract from his letter given in our columns of the 8th of May, 1875, which he had penned on the afternoon preceding it; and, as the Tuscan has it, they felt the sun was blotted out.

It has been the intention of the enterprising publishers of the book before us to keep the memory of Stevens green. We trust it may be ever so in the hearts of all who love singleness of purpose and devotion; if we have ventured to point out mistakes in the attempted Biography and failings in the Man, it is with the desire to speak of him as he was,—to "nothing extenuate nor set down aught in malice." His very failings were virtues run to seed; and any presentment of the man without them would be incomplete.

It is refreshing to dwell upon the character and work of a man who had an ideal and clung to it, in these latter days of hard brutal materialistic realism: such men are preachers, crying out that there is a somewhat else than to-day and to-morrow and the next day; and while heartily thanking the publishers for giving us this book, we commend it to our readers as a beautifully illustrated volume, the price of which really puts it within the hands of every art-student, and that is where it should be.

CHARITABLE AND PAROCHIAL ESTABLISHMENTS.

UNDER this title Mr. Saxon Snell, who has had large experience in planning and designing buildings of the class indicated, has published what is a very useful and practical book.* No architect can do anything more to the purpose in the way of publication than to give the results of his experience in dealing with any class of buildings of which he has had the responsibility. The author appears to have undertaken the task in the right spirit. He submits to criticism, he says in his preface, "not without considerable hesitation," a selection of executed and unexecuted designs illustrating attempts to solve the question, How best to arrange buildings for the accommodation of the poorer classes of the community? But, as he observes, no such work has been published, and if his plans do not solve the problem, they form, at any rate, a very useful contribution to it, which will be the more beneficial if others are induced in a similar manner to give their experiences.

Before quitting the preface, we may give further currency to one paragraph of it, which touches on a subject much needing consideration at the hands of those who are concerned in promoting such buildings. One of the greatest difficulties, Mr. Snell observes, which an architect has to contend with in planning public buildings of this class is the disinclination of his clients to contemplate any but immediate wants. "If, for example, their present establishment consists of buildings erected 150 or more years ago, and one portion having fallen into decay has to be rebuilt, they will not be told that, as in the natural course of things the rebuilding of the whole structure must sooner or later follow, it would be advisable to prepare a design for its ultimate reconstruction on more modern principles, and in such wise that the part to be immediately rebuilt may form a congruous portion of the future new establishment. The result is that the planning of the reconstructed building is in many respects defective, even though the architect may have done his best by anticipation to minimise the evil." And, unfortunately, the architect who gives this sensible and prudent advice will be supposed by many people to have his own interests in view in suggesting the preparation for a larger scheme. The general statement here made, however, cannot be so misunderstood, and we strongly recommend it to the consideration of Boards of Guardians.

The buildings which are illustrated in this work might be broadly divided into two classes: those in which it is right and desirable that the inmates should be made reasonably comfortable, and the building to some extent attractive and cheerful; and those sad and dreary structures which represent only the official provision for giving shelter to persons who for the most part have little claim on the goodwill of their fellows beyond the fact that, as Macbeth puts it, "in the catalogue they go for men," or women. For this class of persons, shortly classified as "tramps," and who for the most part are probably persons who will not do honest work except upon compulsion, the buildings called "casual wards" are provided, and grim enough structures they are. Still, the plans and provisions of these buildings, as illustrated in Mr. Snell's book, show the possibility of a vast improvement on the state of things described a good many years ago by the journalist who earned a curious kind of fame as the "amateur casual." Those who claim refuge in the casual ward as illustrated in this book must at least be compelled, though by rigorous and mechanical means, to undergo for once the experience of orderly arrangement and good ventilation. The "St. Marylebone Temporary Casual Ward" provides a row of sleeping-berths raised from the floor, and divided by low stall-boards, and is warmed by hot-water pipes, and ventilated by fresh-air ducts. On the walls and roof-timbers are painted a few simple and straightforward passages from the Bible,—"Thou, God, seest me," "Let him that stole steal no more, but rather let him labour," &c., which may occasionally, perhaps, remain in the mind of some waif and stray who can read, and who is not quite given over to good-for-nothing-ness. But this plan of casual ward has now been superseded for the most part by one which entails the separation of each inmate from the rest, from the time of entering at night to the time of leaving in the morning. It is, in fact, exactly like a prison, entered voluntarily, but from which exit is not permitted till the allotted work is done. Each man is placed in a separate cell with a bed and a small window of inspection opening on the central corridor, and as an anteroom to his sleeping-berth, is a square labour-cell, in which he will find a certain amount of blocks of granite, which he must break up, and pass out the whole amount broken through a grating in the outer door, before it will be opened for his exit. There seems something dismally harsh in giving men a night's lodging on such terms and under such conditions; but we presume the evils of intercommunication in the old wards between bad characters, or between the worst and those who are not so bad, have been found too serious to be ignored. In the similar establishments in which the work consists in picking oakum, and, in the women's department of the one we have been mentioning, the "labour cell" is not required, the work being done in the sleeping-room. A building on a somewhat similar plan is given, which was planned for a M. Ragosine in Russia, and built at Nijny-Novgorod-on-Volga, as "Lodgings for Houseless Poor." This consists of three long blocks of dormitories arranged in T-shape, two of them for men and one for women, with the waiting-rooms for applicants of either sex placed at the intersection of the blocks. These blocks consist of rows of separate cells, each with a bed and a separate external window, opening out of a centre corridor; at the end of the corridor in each block are the water-closets, divided from the dormitory by a ventilated lobby. This plan the author recommends as very suitable, with slight modifications of detail, for a London casual ward plan. A larger centre block would in that case be required, or part of each wing would have to be appropriated, for the bath-house, which is a *sine quâ non* in a casual ward, and through which alone can the sleeping lodgings be reached.

This class of buildings, however, only occupies a small proportion of the publication, which is chiefly devoted to the illustration of workhouses and workhouse infirmaries; buildings on a large scale, and in some of which a certain amount of architectural effectiveness is aimed at and obtained. Some of these have been illustrated in our pages. The first plan we come upon is rather a startling one when considered in relation to the now generally accepted theory and experience as to the planning of sick wards. This is the plan of the infirm wards at St. Marylebone Workhouse, and in order to utilise a limited space for the greatest possible number of inmates a plan was made in which the cross ventilation and lighting is from either end of the ward and the beds are placed in rows against the side walls where there are no windows, and two rows down the centre, head to head and separated by a screen. At first glance it would seem that this was a most unsanitary and unscientific plan, and the author admits that he had great difficulty in getting the Local Government Board (then the "Poor-Law Board") to sanction its erection, which they eventually did only on the expectation that it would be pulled down when the lease, which had only twenty years to run, had expired. The architect was quite alive to the fact that his plan was one which sanitarians would be disposed to condemn, and he seems to have been put on his mettle and made up his mind to show that he could render the rooms sanitary. We quote his own statement:—"Inasmuch as it had been predicted that it would be impossible to properly ventilate a building constructed on such a plan, very great pains were taken to make ample provision in this design for the inlet of fresh air to the wards and the outlet of foul air, and to this end channels were constructed from the front to the back walls running under the heads of all the beds, for the admission of fresh air, and the side walls next the beds, being made two bricks thick, were filled with upright flues, 18 in. by 9 in., for carrying away any vitiated air to above the level of the roof. As a further precaution, a boiler was erected in the basement, and steam-pipes passed through all the above flues in order to better induce an upward current in them. This apparatus was, however, soon dispensed with, as the natural ventilation was found to be sufficient." With all these

* Charitable and Parochial Establishments. By H. Saxon Snell, F.R.I.B.A., &c. B. T. Batsford, London, 1881.

special precautions a great deal of the disadvantage of the plan was no doubt removed; but this does not alter our opinion that end-lighted sick-wards are not desirable. Nor can we entirely approve of the planning of the water-closet department, with the closets also against an inner wall, and in a very confined situation. The statement of Dr. Bridges, the Local Government Board Inspector, that it is difficult to speak of the general arrangement too highly, only seems to show that the Inspector has something to learn on the subject of planning and arranging such buildings. As far as the architect's part is concerned, we must take it that the arrangement of the plan arose partly out of difficulties in regard to space, but we should not recommend adopting this plan as a precedent, in spite of its having proved, owing to the various precautions mentioned, less objectionable than might have been expected. It seems to have been repeated in the Holborn Union Infirmary (the plans of which are given), at the wish of the Guardians, though "the Local Government Board objected to such an innovation in hospital construction" (or, rather, to such a return to an exploded arrangement), and rightly, to our thinking. After a long controversy, it was decided that some of the wards should be built on this principle (the "Infirm Wards"), and those for more serious illnesses on the pavilion system, and this compromise was adopted. We should observe that the bow-windows with seats in them, which form a feature in Mr. Snell's infirm ward plan, are a very pleasant addition to the room, while they have the constructional advantage of assisting the stability of a long length of wall without cross walls.

The majority of the other large plans given in the book are on the pavilion system, and present no very special matter for comment, or at least none for fault-finding. They, can, in most respects, claim to be excellent model plans, and are worth the attention of those who are at all likely to be engaged in similiar work. There are several enlarged details of methods of warming and ventilation which are worth notice; and a very useful appendix in the shape of reprints from official documents, embodying Government recommendations or regulations in regard to the construction and arrangement of the class of public buildings dealt with. Under the head of data for cost, the author thinks it better to give merely cubical contents of some of the buildings, from which approximate estimates on the basis of present prices can be made; not only have the conditions under which the cost of the actual buildings was determined been very various, but some of them had been erected at such a ridiculously low cost that it would be necessary, says Mr. Snell, to complete the illustration, to say, "how soon after the completion of the works the builder became bankrupt, or compounded with his creditors."

Among the plans not carried out is one of some interest, consisting of an attempt to work out, into the form of a large Pavilion Infirmary, Professor Marshall's idea of circular wards. Seven of these the author has arranged in a semicircle, connected with a central administrative block by radiating corridors, flanked by nurses' rooms and other adjuncts. With circular wards this system may work well, and there is a good deal to be said for the circular ward in itself; but the author pushes it too far in saying that the same radiating system could equally be carried out with rectangular wards, according to a sketch-plan which he gives. This radiating plan has long been condemned for hospitals or asylums; for one reason, at least, if not for others, viz: that all the wards cannot possibly have a good aspect in regard to sun and prevalent weather; if some are good in this respect, others must necessarily be bad. With the circular form of ward this objection nearly disappears, or at least is much lessened.

One rather melancholy interest is given to the book by the fact that the frontispiece, a view of St. Marylebone Workhouse before reconstruction, is the work of a pauper inmate, bearing, we are told, a well-known artistic name; and the title is designed and drawn by a well-known architectural artist, also an inmate of another large workhouse. Here is one of the sad problems of modern life brought practically before us. Both drawings are very good, but the possession of these powers did not enable their authors to make a living by them, or preserve them from the melancholy position of dependence on official charity. How many more persons might be found, we wonder, among the inmates of large workhouses, who once held hopeful and apparently prosperous positions, and how came they to their present position? It would be an instructive chapter, if it could be truly written.

THE SEBASTIAN DEL PIOMBO OF THE NATIONAL GALLERY.

WE scarcely know whether to express pleasure or anxiety on finding that Sebastian del Piombo's famous picture of the "Raising of Lazarus" is at present in the hands of the cleaner. Certainly it is a matter of regret to find, on visiting the National Gallery, the empty frame which has so long contained the familiar work, without knowing exactly how long it may be before the picture is replaced, and without any knowledge or power whatever of obtaining in the meantime information of the processes to which it may be subjected. A picture of such extraordinary rarity, and whose history is so unusually well authenticated, and about which so much has been said and written, seems at the present time to call for something more than the mere notice that it is withdrawn for a time from the walls of the National Gallery. A great anxiety on the part of all lovers of old art is certainly excusable when we see so many instances round this empty frame where injury, very grave injury, has been done to the work of great artists. In what gallery of pictures, indeed, may this not be said to be the case? How is it possible that works naturally, if not exactly fragile, certainly easy of injury, should have escaped the influences of time in the many centuries of their existence? When we remember how rarely our own possessions, carefully tended as they may be, escape altogether the carelessness of servants or the want of watchfulness on the part of ourselves, must we wonder that even the most valuable pictures have scarcely, during the troublous times of past ages, escaped the injury certain to occur where objects have been little watched? On the contrary, we ought to, and very often do, wonder how they can have escaped destruction altogether. Personally, however, we have every confidence in the present Director and the Keeper of the National Gallery.

Sebastian del Piombo's "Raising of Lazarus" does not merely belong to the class of works generically classed as "old masters,"—works that the care of the past has bequeathed to us. It is one of the famous pictures of the world; it is bound up intimately with the history of art, in the edifice of which it may be said to be one of the principal stones. In the history of the National Gallery, again, it bears another interest. It is many years to look back, but we remember well the picture hanging on the walls of the house in which was formed the nucleus of our great institution in Trafalgar-square, when the National Gallery was still, if no longer in the possession of Mr. Angerstein, at least shown in his old house in Pall Mall, on the site where now stands the Travellers' Club. Then, as it still is, the Sebastian del Piombo was justly looked on as the greatest treasure of the collection of which it formed a part. It was No. 1 in the catalogue, and as such was long entered. It is to our collection, in fact, what the "Marriage of Cana," by Paul Veronese, the "Jocunda," of Leonardo, or the Giorgione of the *Salon Carré*, are to the Louvre; the "Madonna del Sisto" to Dresden; the Velasquez to Madrid; the "St. Cecilia" or the "Francia" to Bologna; the "Assumption" to Venice; the "St. Jerome" and the "Transfiguration" to Rome; the Raffaelle cartoons to our South Kensington; the "Sposalizio" to the Brera.*

Since Mr. Angerstein's time, if we remember rightly, the surface of the picture has been but little touched; the varnish which has become dirty is to be removed, and we are told that the beauty of the picture itself will be so increased by the removal that every one will be astonished.

Much as has been written about this famous picture, it is scarcely too much to say that it is the most deservedly celebrated picture historically in England, and it is likely throughout those extraordinary changes of what we thoughtlessly call "fashion in art" to hold its own in the estimation of the learned, and to retain that respect to which the work of the great artists of the Renaissance must be always entitled.

* Waagen, when he wrote many years ago, said of the "Raising of Lazarus," that it was "the most important specimen of the Italian school in England."

In what manner this picture is, as we have remarked, more intimately connected with the history of art than the crowd generally of other "old masters" is a story that has been told, it is true, more than once, but the occasion of the temporary disappearance of the work from the walls of the National Gallery may not be inopportune to tell again the connexion this picture bears with the emulative struggles of three great artists,—Raffaelle, Michelangelo, and Sebastian del Piombo.

Versions differ as to the exact origin of this picture. It would seem, however, that Cardinal Giulio de' Medici, when archbishop of Narbonne,—he was afterwards to rule as Clement VII.,—commissioned Raffaelle in 1519 to paint for his cathedral a "Transfiguration," and Sebastian del Piombo a "Raising of Lazarus." It can be understood that, in such a struggle, Sebastian's utmost emulative powers were roused. It is here that Vasari introduces the aid of Michelangelo, desirous to support a rival to Raffaelle, who, however, on hearing of the great Florentine's action, is reported to have written courteously his thanks that he was permitted the honour of competing not alone with Sebastian, but with one so great as he.* It is this historical interest, in addition to the intrinsic artistic merits of Sebastian's great picture, that has rendered it famous.

The collaboration of Michelangelo seems proved by Vasari, who, however often we may have to suspect the evidence of the amusing *raconteur*, would here have a right to be believed; we know him to have been the friend both of Michelangelo and of Sebastian, and he tells us distinctly that the "Raising of Lazarus," with several other works of the Venetian painter, were executed "*sotto ordine e disegno in alcune parti di Michelagnolo.*"

M. Reiset, in his interesting notes on the National Gallery, has drawn attention to a curious letter of Sebastian relating to the "Raising of Lazarus," and printed in the Life of Michelangelo, recently published at Florence. The letter, which is dated July 2, 1518, speaks of the picture as being on the point of completion. Sebastian had, it would appear, obtained from Cardinal de Medici the promise that the two pictures should be exhibited together. Raffaelle, we gather from this letter, had not at this time commenced his work, and Sebastian was unwilling that his rival should see his picture. *Credo che non vi farà vergogna.* The rest of his letter is somewhat painfully filled with complaints of the success of his rival. But if Sebastian imagined he was pleasing his friend by abuse of Raffaelle, he was, it is certain, singularly ignorant of Michelangelo's character. In no portion of that great artist's bulky correspondence (published some time since at Florence) is to be found, as M. Reiset remarks, a single word against Raffaelle, and that painter's respectful estimate of his great contemporary we have already seen.

Sebastian del Piombo was not destined to be long troubled with his rival; Raffaelle died but a year or so later, leaving, as is well known, his "Transfiguration" to be completed by the head of the young band who had surrounded him so brilliantly, and Sebastian del Piombo was to take the place left vacant by the death of the young Umbrian painter. The "Transfiguration" remained, as it has to this day, in Rome. As the catalogue of the National Gallery relates, Sebastian's "Raising of Lazarus" was sent to Narbonne and purchased, at the beginning of the last century, by the Regent. With his collection it passed to our shores. Mr. Angerstein was long the owner of it, and when, in 1824, the National Gallery was established, it formed one of the original pictures of the collection. In artistic circles the tradition has not yet died out how Mr. Angerstein refused for his Sebastian del Piombo a princely offer from Napoleon, made in order that this famous picture might hang opposite the "Transfiguration," where there figured temporarily so many others of the artistic marvels of Italy, Germany, and Spain, in the galleries of the Louvre.

And now this work has to pass the ordeal of being cleaned and restored,—not, doubtless, before all due consideration has been given to the important question. In support, too, of the action of the National Gallery authorities, it may not be uninteresting to quote the views

* According to M. Reiset, "Visite à la Nationale Gallery," reprinted from the *Gazette des Beaux Arts*, the proofs of this statement are to be found in a little work published in Venice in 1557, by Ludovico Dolce ("Dialogo della Pittura").

expressed on this very picture some years since by so competent an authority as the curator of the paintings and drawings of the Louvre,—M. Reiset. The picture, he remarks of the "Raising of Lazarus," has suffered at various times, and the state in which we last found it is far from being satisfactory. The colouring has taken an aspect uniform and without transparency. But it does not seem that the ill is irreparable. A prudent and skilful hand would easily remove much of the damage due to the want of skill of those who have had control over it.

OF ARCHITECTURE, SCULPTURE, AND PAINTING, IN UNITY.*

PAINTING and sculpture, in the sense of the poets, were accounted twins; and Evelyn joining with them architecture, declares those three illustrious and magnificent arts so dependent upon each other, that they can no more be separated than the Graces themselves, who are always represented to us holding hand-in-hand, and mutually regarding one another; we may reasonably conjecture that they were born together.

By a careful and unbiassed study of former ages, the press enables us to survey the several phases through which art has passed. We are in a better position, at the present time, to arrive at a just appreciation of the mental work of our ancestors, than was the case when the means of acquiring and transmitting learning were tedious and difficult of accomplishment.

In treating of architecture, sculpture, and painting, they should be studied individually as well as collectively, so as to form, when in unity, one harmonious whole. To accomplish this, the labours of the past must be respected, and improved upon. There are certain principles derived from natural laws and reason not to be overlooked, which pervade all architecture, sculpture, and painting, irrespective of styles or tastes, and are ever to be found in all works of genius and education,—

> "For beauty born within the mind
> Admits no mean decay;
> The earth may shrink, the sun grow blind,
> Ere that dissolve away!"

That the architect should be an artist is of grave importance, as it tends to raise him from a mechanical or material status. With this view a comprehensive and artistic field is presented, of great interest both to the architect and the public.

The preparation of geometrical drawings, plans, elevations, sections, &c., is a necessary constructive and mechanical process; in like manner with the sculptor who first forms a model in clay, entirely the work of his own hands, and before he begins, the statue is perfectly imagined, and the figure in visionary form is complete before him. The painter, also, prepares the ground-work of a picture, and roughly puts in the lights and shades, real and imaginary. Something more, however, is wanted, and essentially necessary, viz.,—to import *life* or soul into the compositions. Before the architect, sculptor, or painter can be ranked as an artist, he must combine, not merely the mechanical or material details, but the elements of his art must be combined into a comprehensive whole. The painter has signally failed in truthfulness, in his otherwise beautiful productions, by a gross ignorance of architecture; the sculptor likewise. The architect, then, to become an artist, must not limit his attention simply to geometrical drawings and details which are never seen in perspective, but direct his mind to the perfect whole, combining the surroundings, sky, trees, mountains, shady vales, flowery plains, green meadows, brooks, rivers, and seas,—Nature's panorama,—in which his buildings form a part. An architect, in harmonising his building with a landscape, must not imitate the painter who is satisfied with the figure, and neglects the drapery.

The architect, as an artist, should also not rest contented with his building and landscape without introducing life:—

> "Suffice it not to paint the scenes you view,
> As well as paint them you must int'rest too,
> Oft be spectators in your pictures seen,
> And frequent actors tread your sylvan scene;
> Let man see man in every line you trace,
> The world's chief honour is the human race."
> ABBÉ DELILLE.

It follows, therefore, that intellectual art and technical correctness are far from identical; that one is sometimes proved by the disdain of the other. And, as this makes the distinction between mechanical and intellectual art, so is the distinction remarkable in proportion as that intellectual art is exercised in the highest degree, in proportion as it realises the ideal; for the ideal consists not in the imitation, but the exaltation of nature; and we must accordingly inquire, not how far it resembles what we have seen, so much as how far it embodies what we can imagine.

It has been urged that "it is hardly necessary to observe that an architectural drawing requires to be viewed as closely as an engraving, so that all its detail may be clearly understood; and if it will not bear, or does not merit such attentive examination, it will hardly be worth much." This is a grave error, as in an artistic point of view, it would be absurd to give detail. There are some buildings which are calculated only for a distant view; for though, when beheld afar off, they may please, yet no sooner do we approach them, than we discover them to be greatly inferior to what they first promised to be. The spell is broken, nor is it to be renewed; because, when we again look at them from a favourable distance, we are aware of the illusion. There is no further any room for imagining beauties in store for us on a nearer examination, which we already know do not exist.

The painter leaves more to the imagination than the sculptor. The retention in the mind of the ignorant details of a well-proportioned building, applies also to a female figure with squinting eyes and flattened nose, after having seen the Venus de Medici, or other perfect figure.

Because detail is not to be discerned in the pictorial representation of a building, it affords no argument in favour of carelessness in the formation of mouldings. Beauty of detail is to architecture what *finish* is to painting, what the elegancies of style are to literary composition, what the graces of expression are to poetry. Mere beauty of language and imagery, however exquisite in itself, will not indeed atone for the absence of higher qualities, yet it will serve to render them still more attractive and impressive. So likewise in architecture, beauty of detail is indispensable to general beauty of composition.

Unity of mind and unity of action and direction can alone produce concord either in music or in architecture. This perfection is to be met with in the fine arts of the ancients. As the arts were then united amongst themselves, so one was scarcely ever followed to the exclusion of the others.

A neglect of this unity is a violation of those laws which have been instituted and established by the joint authority of architects, sculptors, and painters. No other unity is intended, and therefore none is to be sought. A fourth sister has been suggested, namely, Decoration; but she would evidently destroy the unity, as decoration belongs to the painter.

We are indebted to the sculptor for eloquence in stone, who reared his marble triumphs o'er decay, by creating the live statue and the polished dome,—

> "E'en thus of old the Cythian sculptor view'd
> The star-like form which bless'd his solitude;
> From earth and earthly beauty he had flown,
> And graved a dream of loveliness on stone."

Sculpture is acknowledged to be one of the most difficult of the fine arts. It is remarkable that it was the favourite art of Greece, and that her sculptors were more numerous than her painters. The Grecian sculptors had no other advantage over its painters than that they used more durable materials; blessed with equal genius, formed by the same education, their hearts went hand in hand to perfection. Rome imitated, but never equalled, Greece in sculpture. Whilst taste survives the famous works of Greece can never die.

The painter, although to a great extent an imitator, has, in addition to a natural genius, if he have any, much to learn, and is at liberty, like the poet and the novelist, to borrow all natural or probable effects,—from a passing cloud to a glimpse of light, real or reflected. Painting, like all other mental arts, was progressive,—

> "By slow degrees the God-like art advanced,
> As man grew polish'd, picture was enhanced."—
> *Dryden.*

Architecture itself can never reach anything like perfection, without the aid and assistance of sculpture and painting; consequently, where these are not, there cannot be the greatest architectural display.

Of the necessity of union among the professors of the fine arts, it has been urged that "the painter, the sculptor, or the architect errs when he imagines that it is in his studio only he can be useful. Far otherwise is the fact; for the varied discoveries of each should be brought, as it were, into one focus, that all may be fairly examined, and beneficially discussed. Shall he whose fine imagination presents before him the lightning's flash, as it glances from the mountain top, and whose ear listens, mentally, to the thunders as they roll through the valleys beneath; shall the man whose chisel can express from the shapeless marble an image which wants nothing but Promethean fire to make it a perfect being; or he whose chastened art can design the gorgeous temples of Greece and Italy, or frame the long-drawn aisle and fretted vault, be content to wrap such splendid talents, comparatively, up in a napkin? Certainly not; neither man nor any of his attributes were ever intended to be completely isolated."

A genius for sculpture or painting includes an eye for form or colour, or both; but it requires intellectual or imaginative powers to rise above mediocrity or mechanical excellence in the highest range of art. Of all the arts, painting, the eloquence of colours, is the most natural both in its means and effects. It is the most direct and immediate address to the senses.

Of all the objects of painting, angels call most for ideal beauty; those of Raffaelle are by no means distinguished in this particular; for he had no examples for them in nature, but was obliged to draw them from his own imagination.

The architect, after having taken a comprehensive view of buildings artistically disposed in combination with natural scenery, in every part of the world, has to direct his skill to edifices in cities, towns, villages, and situations more or less closely grouped. It is absurd to create streets with rows of houses, composed of horizontal lines, copings continuous, openings without mouldings or ornamentation; or a lengthened series of gables and gablets arranged monotonously like a crocodile's teeth. By avoiding straight lines in the formation of a street, the buildings can be disposed, as in the High-street, Oxford, and presented to the eye separately, but not as a whole. The present system of separately designing each house in a different style of architecture, enabling the architect to exhibit his own taste, produces an inartistic and discordant effect.

Architecture, although one of the fine arts, still hardly obtains any notice, and is seldom recognised by critics in general. Both the public, and those who affect to direct the public taste, seem to consider the pretensions of architecture as rather of a negative kind, compared with those of sculpture and painting. At the Royal Academy, as is well known, it has for years been looked upon too much in the light of a "poor relation," admitted out of mere charity.

Upon reflection, the architect is at fault, and not the Academy. The Academy cultivates architecture as a fine art, and not in reference to mere building; consequently, as before stated, the architect must be an artist, otherwise her sisters,—sculpture and painting,—will remind her of her original signification, "chief builder."

In the absence of sculpture and painting, no building, however well designed, can be rendered intelligent or of historical value without invoking the nine goddesses known as the Muses:—(1) Clio, presiding over history; (2) Melpomene, over tragedy; (3) Thalia, comedy; (4) Euterpe, music; (5) Terpsichore over dancing; (6) Erato, comic poetry; (7) Calliope over eloquence; (8) Urania over astronomy; and (9) Polyhymnia over singing, rhetoric, and harmony. They were called from the places where they were worshipped; their parents being heaven and earth. The Muses may be viewed in the light of train-bearers to the three sisters, Architecture, Sculpture, and Painting.

Without a generous encouragement, the fine arts can no more flourish, or even exist, than a perfect flower-garden. Ovid alludes to the utility and pleasure we receive from encouraging the polite arts:—

> "Each pleasing art lends softness to the mind,
> And with our studies are our lives refined."

The patronage of enlightened individuals and distinguished societies, such as the Society of Dilettanti, has in past years rendered great service. The countenance of the Government, and some assistance from the public purse, are also essential towards promoting the advancement of the arts and sciences, and thereby ob-

* By W. Pettit Griffith, F.S.A.

taining the approbation of all cultivated minds. The liberal, like the mechanical arts, depend wholly on the encouragement they meet with.

It has been urged that there is always a vast floating capital of invention and intellect, which only requires to be directed into the proper channels, to multiply a hundred-fold.

Closely connected as the fine arts are, their natural alliance does not always act amicably. The painters consider themselves and their works the chief, and architecture as subordinate. It should be recollected that the painters belong to the architects, and not the architects to the painters. It is true that the architects have learnt nothing from the painters, beyond the art of making bad designs into showy pictures.

They,—

"Neglect the sense, but love the painted scene."—*Creech.*

Forgetting that,—

"Good sense and nature always speak the same."—*Juv.*

Nevertheless,—

"The practis'd painter may, with skilful art,
Bid striking objects from the background start:
Wouldst thou for nature all thy efforts use,
Let not a random view these objects choose."

The profession of an architect is beset with many difficulties, of which the sister professions (sculpture and painting) are ignorant. The architect alone is subject to that ordeal,—the obligation of showing his work during its progress; his designs are, besides, frequently marred to suit the purposes of economy, or the contingencies of locality.

The union of the three sisters,—architecture, sculpture, and painting,—having the same dispositions, sentiments, and aims, and that oneness whereby, being united to the same end, cannot fail in realising a perfect building. In this case the sculptor and painter must be guided by the architect in proportioning and designing all pediments, niches, pedestals, and other features, so as to avoid incongruities. Many beautiful statues and decorations have been marred by clumsy, ill-proportioned, pedestals, and unmeaning surroundings. Perfect harmony cannot be secured without the sisters acting in concert.

To combine the three perfectly, so as to produce a beautiful edifice, requires genius:—

"The seeds of taste in numerous breasts are sown,
But few can mighty Genius call their own."

True genius springs up we know not from what quarter, what station, what parentage; it is heaven's lightning, which shines from the east to the west, yet no one knoweth whence it cometh or whither it goeth:—

"For genius, when unpractised in scientific rules,
If nursed by nature, disdains the critic's schools."

"Taste is confined to rules, it moves in chains;
Genius those fetters and those rules distains."

Architecture is the force of genius discovered. In the proportions of a noble edifice you behold the image of a creative mind. The uniformity and unparalleled simplicity of the Classical and Mediæval styles are not the result of mere mechanical skill, but of a bold and aspiring imagination. The vaulted roof, and the lofty column which seem to rest upon the horizon, and to repose in air, speak the elevation of the constructor's mind. The civilisation and refinement of nations are strongly marked by the plan and order of their buildings.

It is related of Michelangelo that he employed himself when a child in drawing with a coal rude outlines of figures. His parents, who were noble, endeavoured to repress his darling propensity, not only by reprimands, but by stripes. The force of genius, however, prevailed over the severity of his parents, and Angelo attained the highest eminence in architecture, sculpture, and painting.

Architecture, sculpture, and painting can be improved by the assemblage of various scattered perfections, and graced by emanations from the kindred arts; what excellence might we not reasonably expect to see them brought to, if the excrescences and inelegancies of ruder times were lopped off by the hand of taste? Are we to select and store up the refuse cuttings and dead flowers deposited in the rear of the garden, in preference to the beautiful flowers and vegetation cultivated in the garden itself.

Finally, architecture, sculpture, and painting ought to be combined in forming a perfect, and consequently, harmonious whole, like the universe; mere architecture is as insipid and useless as the moon without the sun, and, although some of the planets and stars have an atmosphere and light of their own, as also sculpture and painting, still it requires and demands their unity to produce one perfect and immortal entirety. The three sisters, then,—Architecture, Sculpture, and Painting,—interesting and beautiful as they are individually, require to be united into one fellowship with the same dispositions, aims, graces, and mutual affection and care for one another.

THE CITY CHURCHES AND CHAPELS: THEIR ACCOMMODATION AND THEIR ATTENDANTS.

THE *St. James's Gazette* has supplied an instalment of an important class of information which ought, in the opinion of impartial and disinterested public writers, to have been included in the returns of the census. As to the motives of the opposition so violently made to furnishing the statist with *data* of a singularly useful kind, we have not now to speak. The *St. James's Gazette* has set an example of what may be done without waiting for the result of a party vote in the House of Commons; and it is to be hoped that the example will be followed, not only through the metropolis, but in all our great towns. We refer to the census of congregations of all the City (London) churches and chapels, taken on the morning of Sunday, the 1st of May, 1881, and published June 13.

In this return, not only are the several churches and chapels for the first time published in alphabetical order, as a basis for comparison, but the capacity of each edifice, taken, it would seem, from the ordnance map; the population of the parish, for the year 1871 (which will have to be corrected from this year's census); the income of the clergy; and the number of worshippers present at each service; are set down in tabular form. There is also given (a matter which does not so directly interest us) an analysis of all the congregations (with the exception of those of St. Paul's Cathedral, the Temple Church, and the Synagogues), showing the respective numbers of paid officials and their families, of choristers, of poor attending for dole, of children in the schools, and of men, women, and children composing the remainder of the congregations. The valuable use which may be made of the latter data will account for the opposition of certain parties to the census. Our present affair, however, is rather with population, accommodation, and attendants.

The number of churches of all kinds belonging to the national Church in the City of London is sixty-three, or one to every ten acres of area. There are also a French Protestant Church, a Dutch Reformed Church, fourteen Methodist and Dissenting chapels, and seven synagogues. The accommodation given comprises 36,655 sittings for the national churches, 340 sittings for the two foreign churches, 2,980 sittings for the synagogues, and 13,944 sittings for the Methodists and Dissenters together. As to the actual congregations, there are, of course, none in the synagogues on Sunday. The national churches contained 9,336 worshippers, the foreign churches 143, and the Methodist and Dissenting chapels 4,256. There are thus provided for the inhabitants of the City of London 53,925 sittings in places of worship, which are in excess of the actual number of residents, which in the late Census (vol. xl, p. 719) was ascertained to be 51,306. The distribution of accommodation is, in round numbers, 68 per cent. for the national churches, 26 per cent. for Methodist and Dissenting chapels, 5½ per cent for synagogues, and ½ per cent. for foreign churches. The enumerated attendants were 13,735; of whom 1,766, or nearly 13 per cent., were persons in some way paid for attendance. It is a remarkable fact that the actual attendants bear a close proportion to the actual accommodation, being 68 per cent. for the national churches. But the children attending the latter were 1,374, against 355 for all the other places of worship (excepting the synagogues). This tells us something of the future; and is further instructive as showing the true causes of the opposition made to collecting full statistical returns as to the number, the accommodation, and the attendance on all the places of worship throughout the kingdom.

A correspondent writes to remark that the evening congregation at St. Paul's Cathedral is usually double, or more than double, that of the morning; and that at most of the City churches, where there is an attractive service and good preaching, the same rule obtains. We do not suppose that there is much Sunday immigration into the City. As to the resident or night-population there, the figures we have cited are enough to show that 27 per cent. of them attend the morning services. To double this for the evening would require that more than every other person in the City would attend evening worship; and if that be anything like the case, London may well claim to be one of the most church-going cities in the world.

The question raised as to "the maintenance or destruction of the churches as works of art and landmarks of history," is one on which much may be said. The destruction of a church is, under any circumstances, a fact involving very many questions, as to which not only very widely different opinions prevail among different classes of people, but as to which the conservative view is held not only by the architect, the artist, or the archæologist. With many, and probably with all those who are at once most earnest and most reverent, the reasons for the maintenance of a consecrated building are very much stronger than any above hinted at. As to that, however, we are now silent. It is enough to point out the valuable work which has been done for the City by our contemporary, and to express the desire that the unnecessary and mischievous mist in which statistics of this kind have been purposely involved by those who dread that the truth should become known, may be soon and honestly cleared away.

We may add that the capacity of St. Paul's Cathedral, which was attended by 1,950 worshippers on the morning of the 1st of May, is stated as low as 3,600. On the occasion of the funeral of the Duke of Wellington it was estimated that there were 15,000 persons in the cathedral, to each of whom the full, deep, slow, and sonorous voice of Dean Milman was distinctly audible. The smallest capacity of a City church is for 150 worshippers, which is the accommodation in All Hallows, London-wall, and also in that of St. Bartholomew-the-Less. The average capacity (excepting the cathedral) is a little over 500. Of the other places of worship, the largest is the Quakers' meeting-house, which would accommodate 3,000, and actually held 49! The average accommodation of the chapels is 850; the average attendance, 276. The smallest congregation enumerated was that of the 22 attendants at the Welsh Baptist Chapel.

KING'S COLLEGE, LONDON.

THERE are many members of the profession who will have watched with more than usual interest the ceremony with which, within the last few days, the half-century's existence of King's College has been commemorated. Not alone in London, and throughout England, but scattered in many parts of the world, there are old members of the college who will have recalled to them the school-days they passed at "King's" under the scholastic and, perhaps, severe shadow of Somerset House, which they will have learnt since those times to look on with respect as one of the noblest features of the metropolis. They recall, after many a year, the unpretentious gateway which opens from the roar and bustle of the Strand to the quiet steps leading down to the school and play-ground,—yard, perhaps, it ought to be called,—and those other more majestic steps, *terra incognita* to the schoolboys, of the college itself, as well as the stately staircase leading to the chapel, a work of the late Sir Gilbert Scott, and with which has so long been connected the name of Canon Barry.

On Saturday last the college jubilee was brilliantly closed by a *conversazione* in the old building,—a gathering which many who were unable to attend the solemn service which had been held a few days previously in Westminster Abbey, and who were prevented from being present at the meeting at Willis's Rooms, succeeded in attending to renew old friendships and recall old times.

But apart from the interest which the memories of *alma mater* ever rouse, whether it be on the banks of the Cam or the Isis, at Bonn, at Heidelberg, or Göttingen, King's College should possess for many of our readers another interest, for with its new buildings is largely connected the name of Mr. C. J. Freake, the record of whose benefactions to King's College will be handed down with respect to future generations as an example to those who generously understand the fecund value of wise benevolence.

At the *conversazione* of Saturday last, as might be expected, Mr. Freake was not one of the least honoured guests invited by "the Council and the Academical Staff" to the entertainment

they had provided. It was only fitting that the building which had echoed to the first lectures of Professor Wheatstone on the great discoveries with which his name will ever be connected should be illuminated by all the brilliancy of the modern electric light, and in the laboratory, which bears Wheatstone's name, and where could be seen many of his old instruments side by side with the most modern in invention, many to be contributed by the College to the approaching Paris exhibition of electricity, there were not a few present who were able to recall the eminent professor at the very time his first discoveries so startled the world of science, now fifty years ago.

We cannot attempt to enumerate all the attractions that were afforded, but it would be ungrateful not to speak of such splendid contributions as the pictures of Mr. J. S. Forbes, of "Chatham and Dover" just celebrity, of the works contributed by the President of the Royal Academy, of Mr. Millais's "Little Mrs. Gamp," of the splendid antiquarian objects of luxury, quite a museum, lent by Mr. Davis and the Rev. S. M. Mayhew, or of the thoroughly well-wrought metal-work contributed by Messrs. Hart & Co.

One novel feature was the tasteful arrangement on each side of the Great Hall of a drawing-room fitted up most successfully for the occasion by Messrs. Jackson & Graham. Upstairs, where the Gallery and School of Art were largely visited, several of the well-known London decorators had vied with each other in the adornment of the at other times sadly grim old rooms of the College.

When we add that under the direction of Professor Monk a charming concert was given, and that at intervals the excellent band of the Royal Artillery played in the entrance-hall, brilliantly lighted by electric light, and gay with flowers and pretty dresses, we think it will be agreed that the *conversazione* of Saturday last will long have a warm recollection among all present, be they or be they not *alumni* of King's College.

MEMBERS OF PARLIAMENT ON ARTISTIC TOPICS.

FROM time to time the members of our governing assembly take the opportunity afforded by some occasion of public speaking, such as a dinner or a delivery of prizes, to expound their feelings and convictions in regard to art. We are always interested in noticing what views are brought forward on such occasions, as a kind of indication of the set of general opinion on matters connected with art. We have had three such deliverances from members of Parliament during the past week, one from Sir Sydney Waterlow, at the Artisans' Institute on Monday, one from Mr. Samuel Morley on the same occasion, and one from Mr. Mundella, at the Artists' Benevolent Fund dinner on Saturday last. Reports are given on other pages.

Sir Sydney Waterlow, speaking on an occasion which had special reference to practical education for artisans, was appropriately practical in his tone. The point of Sir Sydney's address lay in the remark which he made as to the increased necessity in the present day for special schools of instruction for artisans, owing to the change in the division of labour in many crafts at the present day. Fifty years ago, he observed, the apprentice was brought up under the roof of his master, who took every interest in teaching him the details of the trade he was learning. In the present day shops were much larger, and work was necessarily more divided into branches, so that an apprentice ran the chance or probability, under ordinary circumstances, of only learning the one special branch of the shop work on which he was engaged. It was as a remedy for this almost unavoidable division of labour that such institutions as the Artisans' Institute were so particularly valuable, by filling up a gap, and imparting that knowledge which could hardly be obtained in the workshops. As a logical sequence to this, the speaker, who was chairman on the occasion, undertook to use his influence with the City Guilds Institute in favour of the promotion of a local technical school in the district, adding that such schools were needed in every large town in the kingdom.

Mr. Morley adduced one very cogent instance of the commercial value of a knowledge of design, in the case of two artisans of Nottingham, who had earned a guinea a week previously to their course of instruction in the science and art classes at Nottingham, and were now able to earn a guinea a day. They were designers of lace patterns,—that is to say, we presume, that their acquired knowledge and taste had enabled them to take up that occupation, and instead of having to send to Paris for "patterns," Paris now sent to Nottingham for designs. This seems a little *couleur de rose*; at least, the power to turn such instruction to such very good account must be a little exceptional, and it would hardly be justifiable to encourage artisans generally to expect such very good return for their devotion to culture. Independently of the variations in personal ability, the market for such acquirements must have its limits, though these may no doubt prove tolerably elastic under certain circumstances.

Mr. Mundella's remarks at the Artists' Benevolent dinner were more directly devoted, as might be expected, to the purely æsthetic side of art-culture. Mr. Mundella exhibits a somewhat roseate view of things also: it is, perhaps, expected of a speaker on such an occasion that he should do so. He is persuaded that we are in a very good way now as regards art and artistic cultivation. He recalls with compunction the 1851 Exhibition, and declares that we could have collected a chamber of horrors out of that Exhibition which would have left the celebrated one in Baker-street quite in the rear. This is not quite a safe line to take. To be a *laudator temporis acti* is a weakness, no doubt, but the reverse attitude is a weakness also. Doubtless we have learned and advanced a great deal since that time, but possibly the 1851 Exhibition was in itself largely instrumental in starting the movement in advance; and possibly, also, our successors thirty years hence may find that some of what we call the good taste of the present day will then appear in a different light, and it may be seen then that a good deal of our taste at present is to a considerable extent the result of fashions which are not based on any very discriminating ideas about good and bad taste in art and decoration. Mr. Mundella put in a word for the "æsthetes," and said he, at least, preferred that a man should worship a blue pot rather than a pint pot; and so far we are with him. But he was much too sweeping when he affirmed that the English school of art in the present day was superior to any other modern school in existence, and that the English school of landscape-painting was the only real one. Now we question if it can be said that an English school of landscape-painting exists at present. Some very fine landscape-painters exist, but that portion of English landscape-painting which has anything of the consentaneous character and aim which constitute a "school" does not include the most powerful and original of our present landscape-painters, each of whom is, in fact, his own "school" to a great extent. The great modern "school" of landscape-painting has been the French, though we fear we must now come very near to speaking of it in the past tense. We had, however, a certain claim to a share in its merits, since it was in fact an amplification of the art of our great painter, Constable. But it was, while the art of Corot, Rousseau, Dapré, and others was at its best, a "school" predominated by a distinct intellectual motive, in a sense in which we certainly cannot be said to have a school in England at present.

Mr. Mundella looks at art very much from a "moral influence" point of view. He congratulates the country that art is no longer a possession of priests and nobles, but of the people generally. That is quite a political and social reformer's view of the topic, and has its own truth. But it must not be forgotten that when art was the possession of priests and nobles, the former especially, it was employed upon greater subjects, and was the work of greater intellects, than it has generally been since. An art which comes home to the people generally has an immense and most beneficent effect in adding interest to their lives; but it can hardly, in the nature of things, be the greatest or most intellectual art. That appeals to the few rather than to the many, although the many catch some reflected idea of its greatness. The art which Titian produced for princes, and which Raffaelle produced for the Church, has certainly not been equalled by anything which in later days has been produced for the people at large. That there should be art for the home and the people is, of course, to be desired; but the highest achievements of art are not likely to be reached in that mission, and Mr. Mundella may not have reflected that it is to the want of such a great stimulus to the highest efforts of art as the Church and corporations once supplied, that many persons qualified to think and speak on the subject attribute the want of grandeur and of high aims in so much of the art of the present day. The analogous influence in modern times will not be supplied by the wish for art for our homes so much as by the desire of great civic bodies to furnish subjects and opportunities on a great scale to artists. For the provision of such opportunities we have long called, and we shall look for the assistance of Mr. Mundella when fresh efforts in this direction are made.

DUST.

WE are not much in the habit in London of regarding with much sensitiveness the opinion of the ordinarily intelligent foreigner, and it is difficult to say whether the ill-considered criticisms that are freely indulged in by literary gentlemen visiting our city have had very much to do in influencing the improvements that,—slowly, it is true, but surely,—are being effected. Still, without any regard to the opinion of strangers and others on many subjects, there are a few saliently offensive points that probably strike the foreigner or the stranger in London that we ourselves, from long use,—perhaps from despair, almost, are in the habit of too readily overlooking.

Too much has been said in condemnation of the absence of beauty in our London streets. Familiarity with streets and highways in other cities does not diminish,—on the contrary, adds to,—our admiration for London; but if the exterior appearance of London, which still retains so very much of its old character, has been aided so greatly,—whatever may be said by would-be critics,—by the thoughtfull skill of modern architects, there are many other points that it is only too evident are in need of careful consideration. Of these, one point most certainly must, and does, strike the stranger in London,—the utter want of cleanliness in such an enormous proportion of our great city.

People who confine their knowledge of London to the favoured districts of Belgravia or South Kensington see about them a condition of streets not by any means, it must be confessed, perfect, but sufficiently cleanly to free us from that feeling of absolute disgust that it is impossible not to experience in many other portions of this huge metropolis. Our own homes, notwithstanding their too often very deficient sanitary arrangements, are kept so carefully by our well-trained maids, who have acquired a dexterity in scrubbing, in sweeping, in dusting, and in some cases in injuring our surroundings, that amounts to almost the exactitude of the most skilfully-contrived machinery; we find at home, as so many of us do, a household state of existence, carried, it is true by great expense, almost to perfection, that we are apt to be indifferent to outdoor annoyances that, at first sight, rarely interfere with our own enjoyments.

To all, however, but the most indifferent and unobservant, it is impossible for a great share of the sense of outdoor or city enjoyment not to be seriously interfered with by the unsightly appearance of our roadways; the accumulated filth, the shreds of paper and unsightly odds and ends that are so imperfectly removed. Difficult and expensive as is the management of the many hygienic necessities of a great city, the cleanliness of the thoroughfares is a matter which cannot be placed in the rank with such apparently Utopian conceptions as perfect systems of drainage and water-supply. To all who know Paris, the possibility of the London streets being kept decently brushed, the dust and stray paper,—this latter a particularly offensive feature,—removed, the roads and pavements scraped, is no Utopian dream: it is a simple matter of appointing an adequate number of skilled hands to do the work, instead of the too few and,—which is the chief point,—utterly incapable and undrilled sweepers and scrapers at present employed.

As little by little the work was done, it would be found to become more and more easy. It must have constantly astonished visitors to the French capital to observe how large an amount of roadway can be attended to by a single active sweeper,—very often a woman,—whose *daily* duty this becomes. Whether the absence from Paris of the unsightly scraps of paper that

defile our London thoroughfares and unoccupied spaces, be owing to the industry of the *chiffonier*, who, with his hooked stick and little lamp, scours mysteriously the streets immediately after nightfall, hurrying every scrap of paper into the huge picturesque basket he bears on his back, we know not, but the fact remains that paper-strewn streets and parks are unknown on the other side of the Channel. The Paris authorities have, it is true, adopted an excellent scheme of allowing a flow of water to run down each side of the street, and into which is brushed all the less offensive dirt which is washed down, the drains being thus continually flushed. Such an expenditure of water our London supply could not, of course, bear; but a supply of proper sweepers and inspectors to see that the work is sufficiently often and thoroughly done is surely within the power of a wealthy community like ours, in which there are, however, so many unemployed hands, though it is, perhaps, to the use of such incapable and indifferent helps that in most cases is due the careless manner in which our streets are at present cleansed.

From a hygienic point of view, if not, at least, from that of exterior appearances, the want of cleanliness in our streets, which in wet, windy, or dry weather is intolerable, cries for attention, and the brilliant illumination of our streets at night only serves in the more crowded thoroughfares to show an atmosphere thickly befogged with dust which the constant traffic is continually stirring from the road and pavement, where it lies unremoved for every current to whirl about. If we knew how much our indoor surroundings suffer by the accumulation of dirt in our streets, if we would only calculate, as great scavengers are called upon to do, the enormous amount of refuse, and how to deal with it, that is allowed to accumulate in our streets, we should begin to see our way to the possibility of avoiding with greater ease in our houses that portion of the scavengers' property that reaches us through our open windows, our imperfectly constructed doorways, and by that insidious process by which dust penetrates through a thousand chinks and crannies.

We all well know what London streets are like in wet and dull weather, or when the March winds fill the atmosphere with something worse than the November fog,—worse, because the fog brings with it merely a series of throat complaints that medical science, in some degree, can deal with; but who or what medical skill, however learned, can venture to classify and detect the numerous complaints, the fearful maladies, that may exist in an atmosphere befouled by the decomposition of a great city like London?

THE NEW BUILDINGS IN THROGMORTON AVENUE.

No part of the City has been more modernised within the last few years by the erection of handsome new buildings for commercial purposes than the locality stretching between London-wall and Throgmorton-street. The freehold of the greater part of the area in this neighbourhood belongs to the Carpenters' and the Drapers' Companies, and the first-named company having some time ago completed and opened their new hall at the corner of London-wall and Throgmorton-avenue, have in succession leased the adjoining land belonging to them on both sides of the avenue, on which several buildings of a costly character, for commercial purposes, have been erected, including the handsome block of offices for the Submarine Telegraph Company (illustrated in the *Builder* in November last), a fine building for the Imperial Bank of Ireland, another building adjoining, of very large dimensions, now in course of erection for Messrs. Gooch & Cousens, together with several other blocks for general office purposes. The only remaining site in that part of the avenue belonging to the Carpenters' Company has just been leased. It consists of the exact site upon which the old Carpenters' Hall formerly stood, and immediately adjoins the Submarine Telegraph Company's offices. A new building is now in course of erection upon the site, from the designs of Mr. Chancellor, architect, and we learn that it is to be similar in its architectural features to the Telegraph Company's buildings adjoining it. The Drapers' Company have likewise leased nearly the whole of their land adjoining, in the direction of Throgmorton-street, upon which similar large blocks of mercantile buildings have been erected.

INDUSTRY AND WAGES IN FRANCE.

LA *Statistique* for 1877, recently published, gives a comparison of wages between 1853 and 1877, which is of considerable interest at the present time, even though the figures are not quite so up to date as might be. French statistics (and especially official statistics) are notoriously late in production, and this one is no exception to the rule. For all this, the tables in this particular case are worth studying, as showing the uniform rise in wages of all classes in the twenty-four years. The list is somewhat long to reproduce as found in the report, and it will therefore be better to select those occupations which have a more direct connexion with building.

Trade.	Daily Wages. 1853.	1874.	Increase	Per cent.
	Fr. c.	Fr. c.	Fr. c.	
Brick and Tile Makers	1 84	2 83	0 92	49
Quarrymen	2 02	3 03	1 04	51
Carpenters	2 20	3 74	1 54	71
Wheelwrights	2 06	3 23	1 17	57
Coppersmiths	2 21	3 31	1 10	50
Rope Makers	1 76	2 63	0 87	49
Slaters	2 16	3 57	1 41	65
Cabinetmakers	2 29	3 15	1 19	53
Smiths	2 12	3 51	1 09	51
Masons	2 07	3 28	1 21	58
Joiners	2 02	3 20	1 18	58
Painters	2 20	3 31	1 10	50
Paviers	2 25	3 32	1 07	47
Sawyers	2 01	3 23	1 28	64
Moulders	3 42	4 81	1 39	41
Locksmiths	2 16	3 28	1 12	52
Stone-cutters	2 39	3 64	1 25	52
Labourers	1 57	2 67	1 10	70
Tanners	1 94	3 01	1 07	55
Fitters	2 82	3 74	1 22	43
Glass-makers	2 08	3 05	0 99	48

It will thus be seen that the trades in general have partaken of a rise averaging for men 52 per cent., and it is the same, though not quite so much, in the case of women. Industries are divided the French into two categories, the great and by small, the former answering to our staple trades, the others to the numerous occupations radiating from these. In the latter, the increase of wages has been in no case less than 40 per cent., while in some it is as much as 70, the average being 52. The explanation of the "grandes" and "petites" industries by statists is, that the first is applied when masses of artisans are employed upon the same thing, and when, so to speak, man is only an integral part of the machine. The "petite industrie," on the other hand, is found where individual labour is the principal element, and domestic rather than factory work is the result. At the same time, the development of machinery in both large and small trades has of late years been breaking down this line of demarcation, so that the garret-masters and small workmen are gradually being eliminated and absorbed into larger establishments. The printing-trade is a good illustration of this change. There are still in Paris and the provinces a fair number of presses doing an average jobbing business, but every year sees some of these disappear, and more ambitious machinery take their place, increasing in size and amount of production, until we arrive at such celebrated printing-works as those of Chaix, Firmin-Didot, Mame, Dupont, &c. It is within the memory of the present generation when the Paris printers made a riot at the introduction of machinery into the printing-offices, of course under the usual misapprehension that their occupation would be taken away. The letter-press printers, however, did not share in the gloomy anticipations; and at the present time, the wage of the Paris printer has enormously increased since 1853, when it was 2 fr. 40 c. per day. The ordinary rate now is 6 francs a day, and as piece-work is generally the rule, compositors can often earn 7 to 8 francs. Women are very largely employed in the departments, and can make on an average 4 to 4½ francs. The wages in the building trades cannot show such great rises as these, but there is no reason to complain on the part of the men, the average increase being about 70 per cent. in the case of carpenters, 58 in that of the masons, and 57 in those of navvies and labourers. Food industries have participated in the same way. Bakers, who earned in 1853 but 1·90 by day or night, in 1877 made 3·31, a difference of 74 per cent. Butchers have risen 64, brewers 51, the least successful being the pastrycooks, who have only had a rise of 32. In the great industries, such as textiles, the increase has been as continuous, and on a still larger scale. A sizer in a Mulhouse factory, who in 1853 earned 1·50 a day, now gets 3·50, a rise of 170 per cent.; a spinner then made 1·75, and worked the way up to 4·15 by the year 1865. In 1855 the mule-spinner received 2·50, and he now earns 4·25, so that, altogether, wages in this branch of the cotton trade have risen by 143 per cent. A woman-carder earned formerly 87 centimes, now she has 1·60, and a girl-spinner at Dornach earns 2·30 instead of 1 franc, an increase of 130. In weaving departments wages have risen within the last thirty years from 20 to 70 per cent. according to the branch of work, and partly to the locality; for, it must be remarked that wages in the same occupation are by no means the same throughout France. For instance, cotton operatives in Alsace gain less than those in the Vosges, and the latter less, again, than those of Normandy. An Alsace spinner will make 3·50 to 4·50, a Vosges spinner from 3·75 to 4·75, and a Norman from 4 to 5 francs. We find something of the same kind in Great Britain, as in our flax and linen trades the wages at Leeds are not so high as those at Dundee; but, generally speaking, there is a greater equalisation in English than French wages throughout the different trades, owing probably to the more intimate connexion of one trading district with another and the action of the unions. While it is gratifying to observe the improved condition of the French workman, the counterbalance of dearer living must not be forgotten. While bread and wine have maintained a tolerably equable standard of price (the latter remarkably so, considering the mischief wrought by the *phylloxera*), butter, eggs, cheese, and meat, and, above all, rent, have increased amazingly; though, after taking these things into consideration, there is no doubt but that the workmen, both in France and England, make more money, in proportion, than they used to do.

THE ARTISANS' INSTITUTE.

ON Monday evening last a meeting was held at the Artisans' Institute, Castle-street, Upper St. Martin's-lane, for the purpose of presenting prizes to the students, and of hearing the seventh annual report read, and statements made as to the future, the Institute being about to become merged in the City and Guilds of London Institute for Technical Instruction, as stated below. Sir Sydney Waterlow, bart., M.P., presided.

Mr. Hodgson Pratt, one of the trustees, read the seventh annual report, which stated that in the last annual report the trustees expressed great satisfaction at having to make the announcement that the City and Guilds of London Institute had expressed their intention of carrying on the work hitherto carried on by the Artisans' Institute in Castle-street, in the new premises now being erected by them in Cowper-street, Finsbury. During the intervening period, the City and Guilds Institute requested the trustees of the Artisans' Institute to continue the work, offering them 300*l.* towards the expenses. That emphatic mark of approval showed that competent judges had pronounced the important work of the Institute to have a recognised value. The Artisans' Institute was founded in consequence of urgent representations, made by skilled artisans and others interested in improving the technical education of workmen, as to the need of an institution where the teaching of the theoretical principles of science which underlay various handicrafts should be combined with the application of those principles to practical work. It was widely felt by the workmen who assisted in the formation of the Institute, that the technical instruction to be derived by an apprentice in the workshop was inadequate, while the ever-increasing tendency towards division of labour diminished the chances of an apprentice becoming a good all-round workman, and prevented his properly appreciating the relations of the several branches of his trade to one another. The work of the Institute had been from the first carried on by teachers who were themselves skilled workmen, and who had taken Science and Art Certificates. Some who might have helped the Institute in its early days held aloof, because it was erroneously supposed that the Institute wished to supersede the teaching of the workshop; but it was soon recognised, on the contrary, that all the Institute aimed at doing was to supplement the teaching of the workshop, and to supply admitted deficiencies in workshop training. The trustees had the satisfaction of knowing that several of the former students in the classes of the Institute had been able, in consequence of the technical instruction they had received there, to take positions to which they could never have attained but for the instruction they had acquired in the

Institute. It was only due to the teachers to say that, for a very moderate amount of remuneration, they had devoted themselves most heartily and energetically to their work. The success of the Institute was also largely owing to the labours of the Rev. Henry Solly, who was the Principal of the Institute during the first four years of its existence. In conclusion, the report gave the following particulars of the classes held at the Institute, viz.:—Solid Geometry, 21 students: teacher, Mr. Millis; Model and Perspective drawing, 19, Mr. Ramsey; Geometry (Art), 6, Mr. Harland; Modelling, 11, Mr. Wright; Mensuration and Quantities, 22, Mr. Harland; Building Construction, 15, Mr. Harland; Bricklaying, 16, Mr. Channon; Carpenters and Joiners, 24, Mr. Staynes; Masonry, 9, Mr. Wall; Metal-plate Pattern Class, 30, Mr. Millis; Metal Turning, 6, Mr. Reed. There were thus nominally 179 students enrolled in the various classes, although, as some students were attending more than one class, the actual number of students was 130.

The report having been adopted, on the motion of the Chairman, seconded by Mr. Samuel Morley, M.P., the prizes to the successful students were presented. The following are some of the awards:—

Modelling Class (for Original Designs).—First prize, A. Young; second, W. Standley.

Carpenters and Joiners' Class.—Advanced, T. Hosken. Elementary, C. Daubeny, first prize; R. Elder, second.

Masons' Class.—First prize, S. Weeks; second, A. Blytham.

Mensuration and Quantities.—Elementary stage, Owen S. Turner.

Bricklayers' Class.—Prize for progress to Mr. Leggett.

The Chairman said he had particular pleasure in attending the meeting, because he was then standing within a few hundred yards of a workshop in which he served a seven years' apprenticeship to a technical trade. He could, therefore, sympathise with the large number of young men present, most of whom, he apprehended, were still serving their time, and he could also appreciate the advantages which the Artisans' Institute afforded them by enabling them to learn something of the science and art of the trades which they followed. No such advantages existed during the time he was an apprentice, between the years 1834 and 1841. He could only hope that the advantages offered by the Institute would compensate to some extent for some of the difficulties in which apprentices and workmen were nowadays placed, as compared with the position in which they stood in olden times,—say fifty years ago, when apprentices were a part of the master's family, in London especially. They lived under his roof, they went with him to his work, they worked in the same shop with him, and he, the master and owner of the business, taught his apprentices the details of his work, and that for two reasons, —first, because he, like the majority of masters at that time, felt bound to do his best (as he had undertaken to do so by a bond which he had given to the parents of his apprentices) to teach his apprentices the "art and mystery" of the craft he followed; and secondly, because it was to the advantage of the master that the apprentice should become as expert as possible, and therefore as valuable and as useful as possible. In those days workshops were not so large as they are now, and the master or workman much more frequently than was now the case made an article throughout, from the beginning to the finish. Nowadays, owing to the employment of machinery and to the large size of the workshops, there was a much greater division of labour than there was in the days of which he had been speaking, and it frequently happened that an apprentice starting work in a large factory or workshop was attached to one particular department, and kept to it, without opportunities of learning anything about the work carried on in other departments of the factory, and he therefore failed to realise the relationship of his own part of the work to the complete whole. Now, the objects of that Institute and of the City and Guilds of London Institute were to afford to apprentices, and to workmen who had completed their apprenticeship, facilities for meeting the deficiencies of the technical education of the workshop. An apprentice or workman engaged in a very large establishment, where he was only employed on certain portions of the work turned out, was very much like a cog in a large wheel: he took his pressure and his part of the work as the wheel turned round, but unless he supplemented the work of the workshop by some such means as joining the classes of the Artisans' Institute, he failed to know or to understand the nature and object of the part of the work which he had done. While he, as treasurer of the City and Guilds of London Institute, was very glad to assent to the suggestion that that body should contribute towards the maintenance of the Artisans' Institute as long as it carried on its work in Castle-street, and that when the time came the work should be taken over by the City and Guilds Institute, he nevertheless could not help feeling some regret that the work of such an institution as the Artisans' Institute should be taken to such a distance as Finsbury, —not that he had any doubt that such an institution was wanted in Finsbury,—but what were the apprentices and workmen of the neighbourhood of St. Martin's-lane to do? He was afraid that they could not go to Finsbury, or even to the central institution in Exhibition-road; for, owing to the long distances, they would have to spend all their spare time in going to and fro. The only hope he had was that the City guilds might, out of their great wealth, furnish the City and Guilds of London Institute with sufficient means to enable the latter body to establish a local school in the neighbourhood of St. Martin's-lane, where, he ventured to think, the success of the Artisans' Institute had proved that there was a demand for technical education. He would endeavour to bring before the Council of the City and Guilds of London Institute clearly and distinctly the fact that the classes of the Artisans' Institute had been established in that locality for several years past, and had done good work, and that they could not be removed to Finsbury without great loss to the workmen of the neighbourhood, in which they had been carried on. The Exhibition of 1851 had first opened the eyes of many to the fact that English productions were in danger of being excelled by those of foreign nations. He was himself an exhibitor of some machines of a very delicate character in that Exhibition, and he remembered comparing the workmanship of those machines with that of machines exhibited by foreign countries; and although, no doubt, at that time, in matters of pure engineering, the English were at the top, yet, in matters of design and finish, it was clearly apparent even then that, unless English manufacturers and workmen looked to it, they would have very sharp work to hold their own. He hoped that we were now thoroughly alive to our weaknesses and defects, and that by means of technical classes and colleges such as had been established, not only in London, but in Leeds, Bradford, and Nottingham, we should make up for time lost,—and when Englishmen did make up their minds as to what was the right course to pursue, and put their whole energies into the work, they very rarely failed. He was quite conscious of the fact that the position of technical education in England at the present time was very far behind the position it occupied in foreign countries. No one could read the report published by the City and Guilds of London Institute as to the way in which technical education was carried out at the technical college at Chemnitz, in Saxony, without being convinced of that. We had a great deal to do to catch up to the foreigners in the way of promoting technical education, and he hoped that not only would the work in this country be aided by the pecuniary help of wealthy individuals and private bodies, but that the Government would before long see its way to do more in the matter. In foreign countries, the technical schools were supported from three sources,—partly by the fees of the scholars and private contributions; next, and to a far larger extent, by the municipal authorities of the cities and towns in which such schools were established; and thirdly, by large grants made by the State out of national funds. It was only right that the State should help in such matters. The question of technical education was not a local one, but was of national importance. Technical schools and classes were needed in every town where manufactures were carried on. In examining, just before the meeting, the work done by the students of the classes of the Artisans' Institute, he had been very much struck by the work done in connexion with the sheet-metal pattern class. At first he could scarcely have realised that such work as was done in that class was not done in the workshops of the trade, but he was informed that few workmen and very few apprentices were able to cut out their own work from the sheets of metal in order to produce an article of which they had a model or perspective drawing before them. It was a great pity that such instruction was not given in the workshops, because if the workmen possessed such knowledge they would be able to do their work more accurately and with greater economy of material than was at present the case. He was quite sure from what he had seen of the work done at the Artisans' Institute that the trustees and those responsible for its management were exceedingly grateful to the teachers of the classes for the good services they had rendered, because, in the beginning of such work, the great difficulty always was to find practical teachers. No doubt very much had been accomplished by the Artisans' Institute in the way of giving a sort of preparatory training to men who would hereafter be of value as technical teachers. He said that in the presence of Mr. Magnus, the Director of the City and Guilds Institute, and of Professor Ayrton, for he thought in schools or classes such as had been carried on by the Artisans' Institute, the City and Guilds Institute might find some persons qualified to be pushed forward to occupy the position of teachers. He was very glad to see the progress made by the masons' class. He frequently travelled on the Continent, and whenever he saw a cathedral being repaired or built he generally looked in to see the kind of workmen employed. He did not recollect a single case in which he found an English or Scotch workman employed on such buildings, but he understood it was no uncommon thing to find foreign workmen employed on the carving or some other details of English buildings. He hoped that the spread of technical education in our own country would obviate the necessity of bringing foreign workmen over to this country for such purposes.

The Rev. Henry Solly, Mr. E. C. Robins, F.S.A.; Mr. Walker (a teacher of some of the technical classes in connexion with King's College), Mr. Philip Magnus (Director of the City and Guilds of London Institute), Mr. Samuel Morley, M.P.; Professor Ayrton, and Mr. Millis, also addressed the meeting, Mr. Samuel Morley paying a high tribute to the zeal with which Mr. Hodgson Pratt had promoted the success of the Artisans' Institute and its work. Mr. Hodgson Pratt, in replying to a vote of thanks for his services, said he had done what he had because he felt that when a man had any leisure, he was responsible for using it in such a way as to do something for the benefit of his fellow-beings. He urged upon the City and Guilds of London Institute that, in whatever they contemplated doing in the future for the benefit of the working men of this country, they must take them into their counsels and respect their desires. Whatever success had attended the Artisans' Institute had been due to that course having been pursued in the first instance.

"BRAMANTE AND ST. PETER'S."

IN reviewing lately, under the above heading, the remarkable volume on the share of Bramante in the design of St. Peter's, published by the Baron de Geymüller (see *Builder* for March 5 of this year), we commented on the elevation of the dome and lantern given, on the authority of Serlio, as the design of Bramante, and expressed our doubts as to whether the lantern in this design was not a dangerously heavy erection to place on the top of a hemispherical dome. In reference to this, it may interest those of our readers who gave attention to the subject to know that there is to be had from the same publisher (M. Baudry, Librarie Polytechnique, Paris), a short treatise or "*étude*," by M. Durand-Claye, in which the question of the stability of this design is scientifically examined. The author, who is an engineer of the "Ponts et Chaussées" department, sums up in favour of the stability of the dome. We can hardly say that we have had time to go fully into the very elaborate calculations and reasoning of the author, nor would they be intelligible in any case without the aid of the diagrams. But we desire to bring the *étude*, which forms a kind of appendix to Baron de Geymüller's work, before the notice of our readers. We may say, however, that though the calculations of M. Durand-Claye may prove the theoretic possibility of the safe erection of the dome and lantern on the section shown, we should prefer to evade the practical responsibility of erecting it, and we imagine most architects would concur with us, unless the condition of very extensive tying were granted, and in that case the problem would not, of course, be the same.

WHITELEY'S NEW BUILDINGS IN QUEEN'S-ROAD, BAYSWATER.

THE very spacious block of new premises, which for some months past has been in course of erection in Queen's-road, Bayswater, for Mr. Whiteley, popularly known as the "universal provider," has just been completed and opened, forming entirely distinct and separate premises from the already large establishment in Westbourne-grove (where everything, from a wife to a box of matches, a babinette to a hearse, may be obtained). The building, which contains thirteen shops, and several floors above, has a frontage to Queen's-road of 280 ft., extending southwards from Douglas-place to the new Paddington Baths and Washhouses, and being carried to a depth of 300 ft. along the return frontage in Douglas-place, occupies a ground area of nearly two acres in extent. The Queen's-road elevation is 65 ft. in height, and is surmounted by an ornamental parapet, with terminal vases in terra-cotta. The elevation is faced with Portland stone and red Aberdeen polished granite. The ground-floor has massive Portland stone piers, surmounted by carved capitals, with figure-heads in the centre. Immediately above the shop entablature an ornamental iron cresting or balcony is carried across the frontage. There are three lofty floors above, each floor containing ranges of three-light windows. The centre of the Queen's-road frontage is surmounted by a tower, covered with zinc, with an iron cresting, rising to a height of 104 ft. above the pavement line. The return frontage in Douglas-place, to the depth of 30 ft., is exactly uniform with the Queen's-road elevation. As showing the large dimensions of the interior of the premises in which the manifold departments of the establishment are conducted,—embracing almost every imaginable trade and calling,—it may be stated that, including the basement, which, like the rest of the floors, is fully utilised for business purposes, the entire floor area of the building is little short of ten acres in extent. And here it may be added that, including those engaged in the Westbourne-grove establishment, the entire number of persons employed at Whiteley's is said to be between 3,500 and 4,000, no fewer than about 250 of whom are clerks engaged in the various departments.

Mr. Ebenezer Saunders is the architect of the building, and Mr. W. Brass the contractor, Mr. Thos. Warburton being the clerk of the works. The cost of the building is stated to have been about 160,000*l.*

In addition to these new premises, another block is now in course of erection immediately on the south side of the Paddington Baths and Washhouses. This building, which is intended for dormitories for the male portion of those in Mr. Whiteley's employment, will have a frontage to Queen's-road of upwards of 70 ft. in height, and 300 ft. in depth. It will contain five stories, with about 100 bedrooms, and dormitory accommodation for between 300 and 400 men. The Queen's-road frontage of the building is in white Suffolk brick, with Portland stone dressings.

THE MERCERS' HALL, CHEAPSIDE.

INTERNAL FITTINGS.

THE interior fittings of the important addition recently made to this building are now completed, and render it one of the most commodious as well as one of the handsomest of the halls of our City Guilds. The style of ornamentation adopted is of the period of the building of the hall,—the period of Sir Christopher Wren.

The principal entrance is from Cheapside. The walls here are of Mansfield stone, and are relieved by pilasters with cornice and frieze of the Doric order. We pass by large oak doors to a *vestibule*, where the walls are lined with wainscot panelling, about 14 ft. high, and above that are covered with leather hangings, the ceiling and cornice representing oak framing, with ornamental plaster panelling.

The *Grand Staircase* is entered from this vestibule, under a bold double archway, supported by fluted columns, all of oak. The area of the staircase on the ground-floor is about 15 ft. by 20 ft., and has a height of above 40 ft. The whole of the walls up to the first-floor landing are of panelled wainscot, relieved by bold carving in the panels and friezes. The stairs are 8 ft. wide. The stringings are richly carved with scroll ornaments, and the balusters are also carved and fluted, each flight being intercepted by moulded newels supporting carved lions carrying shields. At the south end is a carved oak screen, separating a space forming a cloak-room. On the west side, facing the entrance under the arches, is a stone chimney-piece, 11 ft. high, picturesquely carved, and in front of this, and associated with it, are two carved pillars, supporting the middle landing of the staircase. On proceeding up the stairs we pass under segmental arches, carrying a coved skylight, filled with yellow and white ornamental glass, and arrive at the first-floor landing, leading directly to the upper vestibule through another archway. The walls of the upper part of the staircase are lined with leather hanging, and the cornice and frieze are of oak, relieved with bronze and gold ornament. Above these are lunette panels, in three of which are well-executed paintings, representing the Arts, Industry, and Commerce; in the fourth lunette, on the south side, being a window, are the arms of the Company in stained glass. In the richly-framed circular ceiling, at the top, is a clever painting of Mercury, by Barrias.

Passing by the *Upper Vestibule*, where the fittings are all of oak, we enter the *Drawing-room*. This apartment is about 53 ft. long, 21 ft. wide, and 21 ft. high. It is lighted by a large centre window, with three smaller windows on each side. The whole of the fittings are in walnut-wood, elaborately carved and relieved with gilding; the ornamental panelling is carried to a height of 12 ft., and is surmounted by a cornice, in which is carved foliage copied from the stalls in St. Paul's Cathedral. In the panels are a series of beautiful arabesques painted in quiet colouring on a diapered gold ground. There are two fine doorways, the frontispiece of each being 16 ft. high; the folding-doors, 9 ft. high, are delicately carved in scroll-work, and contain carved medallion figures in low relief; in the parts above are figures and foliage in bold relief. The two chimney-breasts correspond in style and equal in size the doorways, and in the carved frames over the chimneypieces are looking-glasses. At the end of the room there is also a carved circular-headed framing, corresponding with that of the large window and similarly draped, enclosing looking-glass, which reflects the length of the room. The walls above the panelling are hung with rich Brocatelle silk, in shades of deep red on a dull ground, and are intersected at intervals by pilasters of grey Bardilla marble with Vert de Gênes panels, framed with gilt moulding and surmounted by gilt capitals. The ceiling is divided into three compartments by enriched beams, supported by trusses resting on the marble pilasters. In the centre of each compartment are paintings, of spirited and graceful composition, by Barrias; that in the centre represents Apollo with figures, symbolising the arts of Painting, Sculpture, and Architecture; and in the panels on either side are figures of Poetry and Music. In the smaller panels surrounding the centre ones are cameo figures on a dark blue ground, and richly-coloured arabesques on gold grounds. The ornamental framework is gilt, the colour of the groundwork being subdued brown. The furniture is very handsome, and made in a style suitable to the period adopted. The curtains are of silk Brocatelle, bordered with velvet embroidered in *appliqué* work in the Venetian style. The Axminster carpet has been especially designed for the room, and is rich and harmonious in colour.

From the Drawing-room we proceed by the central doorway to the Court Parlour, which has also been handsomely decorated, and thence pass through the Court-room with its dark oak panelling, relieved by gilding, to the large hall, a stately room, retaining the original dark oak panelling to a height of 20 ft., and around the cornice of this are ranged the numerous coats of arms of past-masters of the company. On the walls above are gilt leather hangings, and the six large windows, three on each side, are now filled with richly-toned stained glass, containing full-length portraits of St. Thomas-à-Becket, whose father lived on the site of this hall; King Richard II., a free brother of the Company; Sir Richard Whittington, master of the Company; Dean Colet, founder of St. Paul's School; Queen Elizabeth, a free sister; and Sir Thomas Gresham. The arms of twenty-four of the more celebrated members of this Company are also displayed in these windows, and the royal arms and those of the Company are placed in the circular windows at either end of the hall. The ceiling and cove of the hall, formerly void of ornament, are now panelled and relieved with colour and gilding.

The whole of the interior fittings, carved work, and decorations described above, and illustrated by us, were designed by Mr. J. G. Crace, and have been executed under his direct superintendence.

DESIGN FOR WOVEN FABRIC.

THIS design is suitable for either silk or woollen fabric, and repeats in 22 in. by 20 in. It was necessary to reduce it very much to show the manner of repeat, and it has by this lost considerably, as designs of this kind always look better on a large scale; indeed, it is not saying too much to aver that it would not be too large if carried out twice or even three times its original size; but as the opportunities for using it on those scales would seldom, if ever, occur, it has been drawn to the above scale to suit the requirements of the present day, and that it might be utilised as a wall-paper if desired.

Although based upon no particular style, it will best convey the idea of that of the time of Louis XIV. or XV. As to its colours, three would be plenty. If in silk self-colours could be most successfully used,—such as three yellows, greens, reds, &c.

For woven fabric it would be better in contrast, as red, gold, and black,—the hatched work being red, the white gold and, the outline and solid parts in black; and it could be used either as curtains or dressing for walls.

PROPOSED MONUMENT FOR THE "PLACE DE LA NATION," PARIS.

A COMPETITION amongst sculptors was held some time ago in Paris for the honour and profit of providing a monument to adorn the *Place de la République* in that city. Amongst the models submitted was one by M. Dalou, which was put aside as not wholly in accordance with the conditions issued. Its merits, however, were so evident, that the jury and the *Préfet* have proposed to acquire it for the city. Its destination is not yet precisely fixed, but it is understood that when completed it will be erected in the *Place de la Nation*.

Of this fine design we give a view, fully agreeing with those who have praised it. The nobility of aspect given to the various figures included, the effect of movement imparted, and the arrangement of the whole, mark it as a work of no common merit. The side view is even superior to that which we show, the front.

EXCAVATIONS AT POMPEII.

A NEW POINT IN THE HISTORY OF ARCHITECTURE.

IN a recent visit to Pompeii I observed, in the new excavations, a piece of architectural detail to which I think attention should be called, as, like many other discoveries, it refutes some preconceived theories,—in this case, as regards the date of a style in architecture.

The authorities at Pompeii have not called attention to it; and, as far as I can learn, no one has noticed it. I explained it to the guide for the benefit of future visitors.

I believe it is the received opinion amongst architects that it was not till the time of Diocletian that arches sprang direct from the columns, and that there is no example before that date.

In the excavations of this year at Pompeii, a large house has been uncovered, in the peristylium of which the arches spring direct from the capitals of the columns, which proves that this architectural detail was known long before the time of Diocletian, and evidently prior to A.D. 63. The house was partly destroyed in the earthquake of that year and had been restored, but in restoring the peristylium they carried the columns up to the base of the entablature. For some reason, in making the repairs they did not carry out the original design, but enough original work is left to show the peculiar construction of arches springing direct from capitals at a date before A.D. 63.

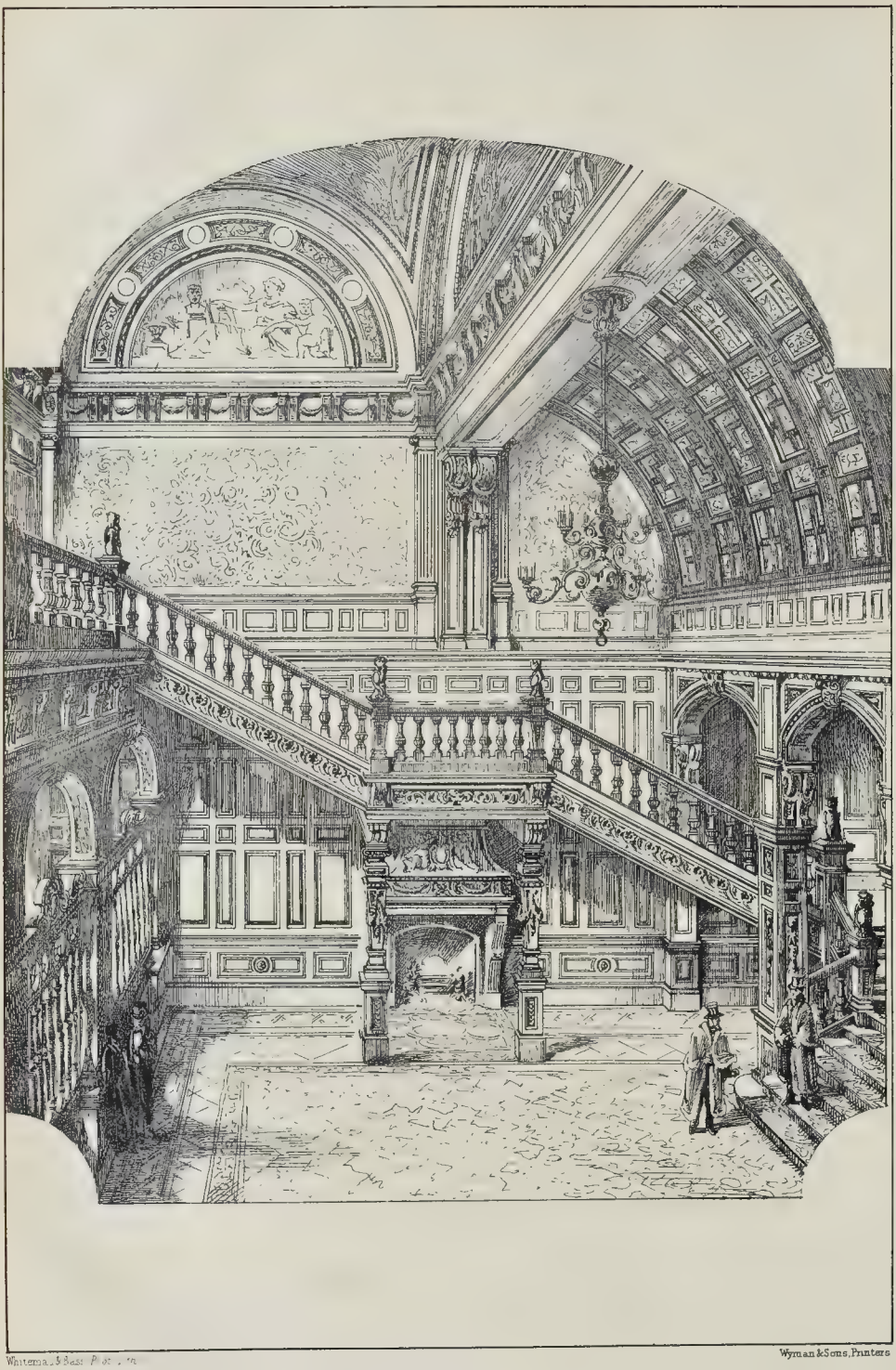
S. RUSSELL FORBES.

*** Mr. Russell Forbes sent us a photograph of the newly-discovered remains, from which we have had a careful engraving made. The point is one of considerable interest.



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WOVEN FABRIC.—By George Chas. Haite.



Whiteman & Bess Photo.

Wyman & Sons, Printers

MERCERS' HALL, CHEAPSIDE: GENERAL VIEW OF THE NEW STAIRCASE.

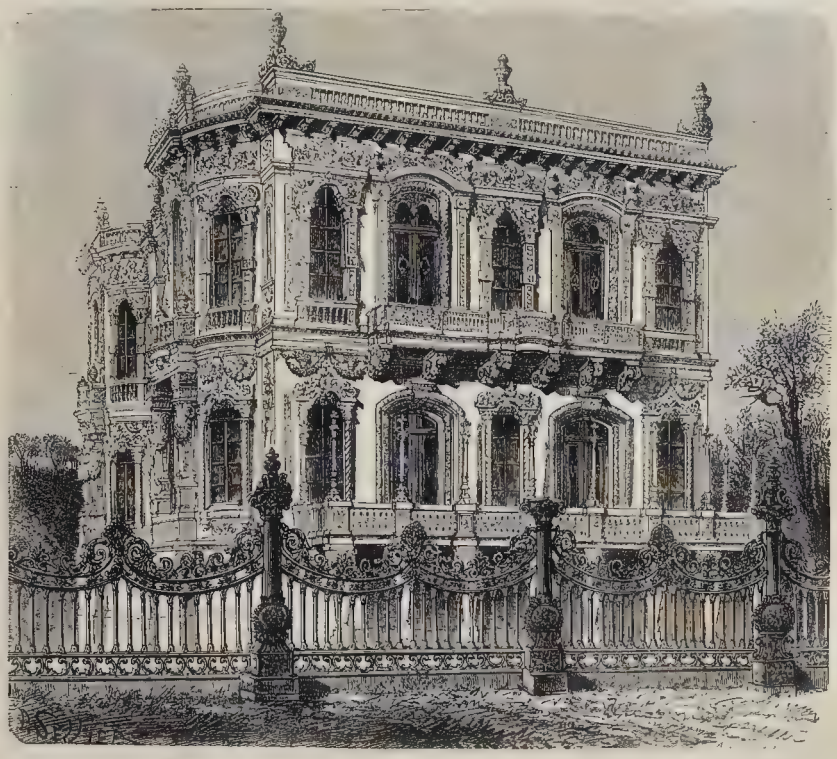
DESIGNED AND EXECUTED BY MR. J. G. CRACE.



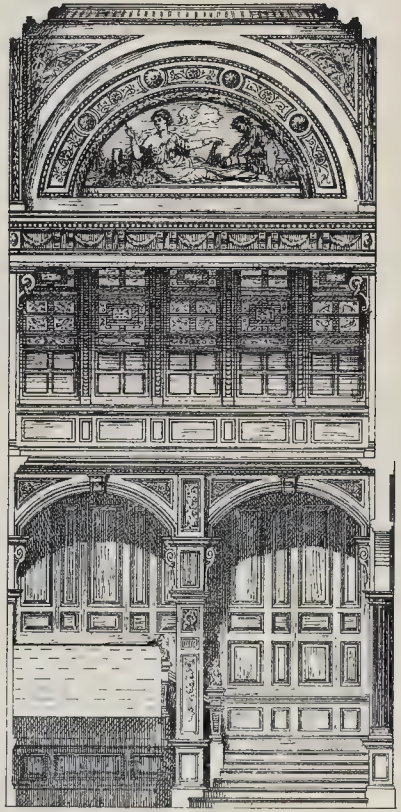
PROPOSED MONUMENT FOR THE "PLACE DE LA NATION," PARIS.—M. DALOU, SCULPTOR.



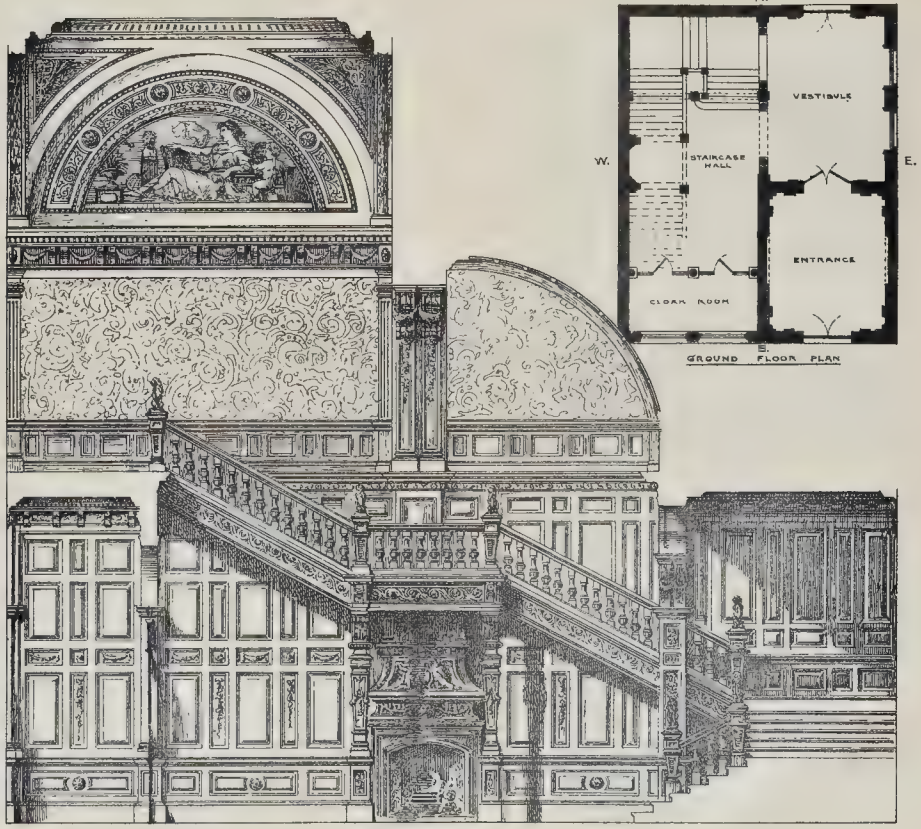
RECENT EXCAVATIONS AT POMPEII.



KIOSK AT "THE SWEET WATERS OF ASIA," ON THE SHORES OF THE BOSPHORUS.



NORTH



WEST

GROUND FLOOR PLAN

Whiteman & Bass *Photo Lith* 236 High Holborn

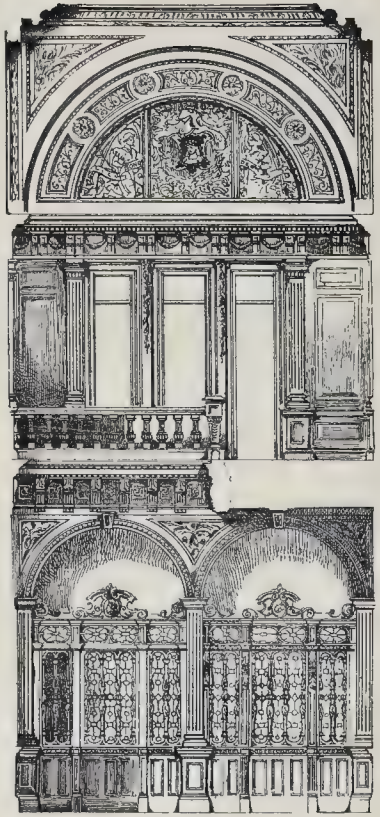
Wyman & Sons, Printers 74 Queen St.

NEW STAIRCASE, MERCERS' HALL.



FIRST FLOOR PLAN.

EAST.



SOUTH.

Whiteman & Bass *Photo-lutho* 236, High Holborn

Wyman & Sons, Printers, Gt Queen St.

NEW STAIRCASE, MERCERS' HALL.

THE IMPERIAL KIOSK AT THE SWEET WATERS OF ASIA.

THE Sweet Waters of Asia, on the borders of the Bosphorus, is a well-known delightful spot resorted to by many visitors, and here, near the well-known fountain of white marble, has been erected the Imperial Kiosk, of which we give a view, for the Sultana Validéh, mother of Abdul Medjid. It is neither Greek, Roman, Gothic, nor Renaissance. At first sight it might be taken for an old Venetian palace, but the mistake is soon discovered. It has a certain charm of its own, and we give a view of it as an example of fantastic and ornate architecture, in the composition of which, however, classic traditions, proportions, and *finesse* have not been disregarded.

The situation and surroundings of the kiosk are of the most delightful character. In this respect the Turks always choose well.

DUBLIN.

The New Sewerage Works.—The allegations made a few months ago as to defective workmanship and construction in the new sewerage works have formed the subject of a careful inquiry by Mr. Cotton, engineering inspector of the Irish Local Government Board. Mr. Cotton, in his report to the Board, after enumerating the charges made against the work, says:—

"With regard to the quality of the materials used, I consider these complaints are without foundation. The evidence generally was strongly in favour of the good quality of the materials employed by the contractor. One witness said that mortar in some cases had been ground and coloured with some material to look like cement. I consider this a wanton and groundless charge. It was not shown that cement was to be used where this mortar was brought, and cement mortar would never be ground at a distance from the works.

As regards workmanship, several defects have been established,—mock masonry in a catchwell,—a house connecting pipe inserted at too low a level,—a very small quantity of underpinning omitted,—a junction made by breaking a hole into a pipe sewer,—temporary covers of manhole and ventilating pipe omitted to be replaced by the permanent covering rings, and an excessive use of bats in places in the arch-sheeting.

These are not serious defects; of course, they should not have occurred, nor could they if there had been clerks of works doing their duty.

The errors in levels are more serious. I believe they would not have escaped the final detailed examination. The way they have occurred is readily understood, and it is to be noted that these errors are due, in their origin, not to the present staff of engineers, but to mistakes made in the preparation of the plans, and only one such additional mistake has been found in all the sections, numbering, I believe, over 200."

The secretary to the Board, in communicating this report to the Town Clerk, says:—

"The Board are glad to find that since the complaints have been made, the staff employed in the supervision of the work has been strengthened by the appointment of two clerks of works, and the Board think that this matter should receive further consideration by the Municipal Council with the view of determining whether additional officers are required in order that there may be uninterrupted supervision wherever the works are in progress. The Board would therefore recommend that the City Engineer be called on to furnish a report on this point with as little delay as possible."

Although many of the charges originally made against the work have been disproved, and were, in the opinion of the inspector, dictated by *animus* against the contractor, it will be conceded that the inquiry was needed.

Utilisation of Sewage.—At a recent meeting of the Institution of Civil Engineers of Ireland, held in Dublin, Mr. G. H. Kinahan, M.R.I.A., read a paper which explained his plan for converting Merrion Strand into sewage meadows. Various schemes had been laid before the public to prevent and get rid of the ill effects of the Dublin sewage, but to him it appeared that no plan would be entirely successful unless the main sewers were discharged outside the heads of the Bay, that is, Dalkey and Howth: consequently, the cheapest mode of getting rid of the sewage was to utilise it, and the best mode of doing that seemed to be by intaking the large tracts of foreshore and cultivating them as sewage farms. The reasons for it being necessary to discharge the sewage outside the Heads would be seen after a study of the driftage due to the tidal currents. On the east coast of Ireland as far as the coast of Louth, the main driftage was northward with the "flow" of the tide; in the bays, however, there were complications due to the "counter-tides" induced by the headlands; and the half "counter-tides," a little before high water, generated by the on-shore current. Of these currents the one which principally affected the driftage was the first, or the "flow" tide, running along the coast from Dalkey, round Sandycove Point, into Scotch Bay, and thence into and past Kingstown Harbour to Booterstown Bay and the South Bull. This at Poolbeg appeared to divide—part entering the estuary of the Liffey, not so much as a current, but more as a filling up or raising of the water ("head of tide")—and a portion set east to the Rossbeg Bank. The effect of the driftage due to the current was very apparent in late years; as, since the construction of Kingstown Harbour, the *débris* carried by it has accumulated in Scotch Bay, margining the outside of the east pier, along which bank the *detritus* travels, part going into the harbour, which tended to fill up the western portion. Prior to the erection of the harbour at Kingstown, and subsequently to the building of the South or Poolbeg Wall, the driftage stopped by the latter gradually silted up the bay in the vicinity of Sandymount and Irishtown, where, at one time, there must have been deep water, as, in the times of De Gomme and Cromwell, hereabouts was the best landing in the bay. From what had already been said, it would appear that on account of the set of the "flow-tide" currents, all matter discharged into the Bay between Dalkey and Poolbeg during the "flow" of the tide must be carried north-westward to be lodged along the shore; while if discharged during the "ebb" a portion might reach the open sea, but the major part would meet the "flow" tide outside the Irish Sea, which began to run before the "flow" tide in the bay—and by it would be carried back again. The matter discharged into the Liffey inside Poolbeg during the "ebb" would divide, part being carried south-east for six hours, and part north-east for nine hours. The portion going south-east would meet the "flow" from the Irish Sea, and be carried back again, while much of that going north-east possibly might reach the open sea, but a considerable portion seems to be stranded on the North Bull Strand by the "half counter-tide" of the Rossbeg Channel. The principal works necessary to enclose this intake and divert the Dodder would be the construction of the "dyke" or outside sea wall (13,500 ft.); a canal (7,000 ft.) with north and south walls (14,000 ft.) through the intake; a gut with one wall (3,000 ft.) along the present shore-line; and to excavate a canal 1,700 ft. long, 120 ft. wide, and on an average 12 ft. deep; also, about 10,000 ft. of minor canals to catch and carry off the upland and storm waters. The sewers are not included, as they would have to be made either here or elsewhere. To catch and carry off the land drainage and storm floods two minor canals would be necessary—the first along the shore line from Seafield House to the south wall (3,000 ft.), and the second from the railway at Merrion to Belvidere House (4,800 ft.). These would empty, by tidal sluices, the first into the Liffey and the second into the canal. The area proposed to be intaken equals about 2,000 acres. These, if let at 5*l.* per acre, would give an income of about 10,000*l.* a year as interest on the money expended. This sum is a low estimate, if we may judge by the profit of the Edinburgh meadows. Mr. Ralph Richardson, F.R.S.E., Vice-President of the Geological Society, Edinburgh, and for many years its secretary, thus writes:—"The celebrated irrigated meadows of Craigentinny, near this city, and irrigated by its sewage, extend to about 163 imperial acres, and the annual rent of the whole is 2,906*l.*, or on an average 17*l.* 16s. per acre per annum. These meadows yield three to four crops of grass annually. The public health in their vicinity is, I understand, good. The meadows were once sandy tracts of little or no agricultural value. Now they are among the most valuable properties in the world—all because sewage (which was running to waste) was allowed to pass through and fertilise them."

A NEW CHURCH AT NEW SWINDON.

A NEW church, dedicated to St. Paul, has just been consecrated at New Swindon. This town has so much increased, owing to the immense number of *employés* at the Great Western Railway Works, that the present structure supplies a want for some time pressingly felt. The material principally used is red local brick, Stoke ground Bath stone being only employed where brick did not come in naturally. In plan the church has a nave 24 ft. span and 86 ft. long, with lean-to aisles 10 ft. wide; the two easternmost bays on each side projecting further, and gabled at right angles to the nave. There is a small north door, and a large western porch entered north and south. It is intended shortly to erect a chancel, with organ-chamber and vestry, and possibly a tower. At present the east wall is a temporary contrivance. The instructions to the architect were to design as simple a church as possible consistent with ecclesiastical propriety. Consequently, the clear-story is not high, consisting of cusped circular windows, the greater portion of the light being admitted through the three-light aisle windows. The nave arcade is carried on circular Forest of Dean piers with plain moulded capitals of square plan. The arches are of brick in square unchamfered orders. Internally the walls are pointed. Externally a few bands of Staffordshire grey bricks and a pattern or two relieve the expanse of red. The nave has a polygonal boarded ceiling, with tie-beams having brackets under, and moulded king-posts to the trusses. The aisle roofs are also panelled, but the trusses are filled in with perforated cusped panelling. All the wood to the roofs is left clean from the tool. There is a projecting pent-roof bell-cot at the west end. The floor under the space devoted to worshippers is laid with herring-bone wood blocks, on the solid system. There are no benches, but chairs of a special type, made of birch (from Aylesbury).

The passages at present are of rough paving, prepared eventually to receive tiles. A raised chancel arrangement, with temporary seats, altar-railing, &c., and pulpit, have been contrived. The font is of Painswick stone. The windows are glazed in ornamental lead quarries of cathedral rolled and white glass intermixed. Fresh air is admitted by air-shafts at intervals, terminating with Sherringham's patent valves, about 7 ft. from the floor. Externally the roofs are covered with Broseley tiles and terro-metallic ridges. The gable crosses are specially designed by the architect, and made by Messrs. Cooper, of Maidenhead. The gasoliers were also specially made by Mr. Court, of Brompton-road, who also arranged the hot-water pipes for the warming system.

The builder was Mr. William Jones, of Gloucester; and the architect is Mr. Edmund B. Ferrey. Simple dwarf enclosure-walls, and wrought-iron railings from the architect's design, are now in course of construction. The total expense has been upwards of 4,000*l.*

A NOVEL BANQUET.

A SUCCESSFUL attempt to begin a reform of public dinners was made on the 30th of June last, by a few members of the Mutual Life Assurance Society, which had features of sanitation and social enjoyment deserving of some notice in the *Builder*.

The apartment selected was airy and spacious, with, on two sides of it, glass, overlooking the beautiful gardens of the Crystal Palace, suggesting a kiosk on the Bosphorus. The ventilation of the room was excellent. Instead of long lines of tables, the company was made up of social parties of ten or twelve persons, each party at a table having its choice of friends. About 160 persons were present.

The programme of the repast was arranged so that the banquet should be completed in two hours and a half, and the festivity was carried through exactly in that time. The courses were less than half the usual number at great City feasts, and seasonable fruits and vegetables were freely introduced, with pleasant and useful effect. Melons followed the soup; after the *pièce de résistance* came iced asparagus, which was a striking feature of the dinner, and the introduction of gooseberry sauce with spring ducklings was another which touched the palate of all who tasted the combination. Three wines only were provided; but good champagne was the popular beverage throughout the dinner, and made good the dictum of Walker,—"Champagne right, nothing wrong." During the banquet there was no clatter of plates, &c., heard, but delightful music was given by the Crystal Palace musicians, and some eloquent speeches.

Each speech was announced by sound of trumpet, and, with one exception, was brief. The chairman (Sir Henry Cole) gave the health of the Queen in twelve words,—"Beloved by her subjects throughout the world, and respected by all others." Mr. Digby Seymour, Q.C., made an eloquent effective speech on "Our Institutions," only it was ten minutes too long, and good and short replies were made by Lord Clarence Paget for Parliament; the Rev. W. Blackley, for the clergy and their duty in preaching thrift;

Mr. Norman Lockyer, for science; and Mr. E. J. Poynter, R.A., for art. The reply for all our forces, "For defence, not defiance," was epigrammatically given by Admiral Sir Edward Inglefield, who called them our "mutual assurance"; and that for "Literature and the Press," by Mr. George Godwin, who showed how important the spread of sanitary knowledge would be to a Mutual Life Assurance Society, and asserted his belief, that under right management, throughout the commonwealth, the normal length of life might be raised to 100 years!

The great object of the gathering was to connect the Mutual Life Assurance Society, "having more than a million of pounds sterling in its till," with provident habits and national Thrift; and Mr. G. Bartley, the inventor and managing director of the Penny Bank, replied to the toast with judgment and brevity. Mr. Pritchard, one of the "Mutual" directors, to whom the carrying out of the banquet had been much indebted, proposed the "Recreation of the People and the Crystal Palace," and Major Flood Page well replied. Mr. W. Burchell, one of the founders of the Mutual, proposed its success, whilst deploring that his floods of eloquence were ruthlessly cut short; but he gave away an admirable history of the Society instead. The toasts concluded with the "Ladies," proposed by Mr. Brudenell Carter, with humour, saying the ladies were essential to mutual bliss. A remarkably fine display of fireworks terminated a pleasant and successful meeting,—so successful that it is to be repeated next year. Many of the suggestions were adopted from "Walker's Art of Dining," which has lately been republished.

ARTISTS' BENEVOLENT FUND.

THE seventy-second anniversary dinner of the Artists' Benevolent Fund took place on Saturday last, the 2nd inst., at the Freemasons' Tavern, the Right Hon. A. J. Mundella, M.P., in the chair. About ninety ladies and gentlemen sat down to table.

The Chairman, in proposing the toast of "Her Majesty the Queen, Patron of the Fund," observed that for forty-two years her Majesty had given the handsomest donation to the Fund, having contributed 100 guineas each year during that long period. Therefore the toast had a peculiar claim on artists. Moreover, her Majesty was herself no mean artist. In proposing the next toast, that of "The Prince and Princess of Wales and the other Members of the Royal Family," the Chairman spoke of the interest which H.R.H. the Prince of Wales took in the Paris Exhibition of 1878, and of the pride which he felt in the success which English artists achieved in that international contest. With the toast of "The Army and Navy, Militia and Volunteers," was coupled the name of Mr. Brock, who briefly replied.

In proposing the toast of the evening,—"Prosperity to the Artists' Benevolent Fund, with the President and Vice-Presidents of the Fund,"—the Chairman expressed his great regret that, owing to a recent and serious domestic bereavement, the President of the Fund (Mr. Beresford Hope, M.P.), was not able to be present on that occasion. They had also to regret the absence of another gentleman who had done infinite service to the Benevolent Fund, Mr. Dimond, the honorary secretary, who was unable to be present on account of ill-health. He had not the pleasure of knowing Mr. Dimond, but from what the President had said of him he had rendered most efficient services to the Fund for many years past,—services that were traditional in his family, descending from his father to him, and as he himself had two sons it was to be hoped that in due time they would continue the work carried on by their father and grandfather. Now he (the Chairman) hardly knew why he should have been selected to preside over the present gathering. He was not a critic, neither was he a connoisseur, although he knew what pleased him; but he was a lover of art, and should be very sorry indeed to live without it. He was there, he was told, because he was "officially connected with art." He happened to be Vice-President of the Council, and in that capacity had to propose to Parliament the votes of money for the great institution at South Kensington with which all artists were familiar. Perhaps it might be said that the reason why he was asked to preside over the dinner of the Artists' Benevolent Fund was because the national institution which he had named was doing more to manufacture poor artists than any other establishment. He hoped, however, that it would be conceded that that institution was of some value, and had done some good for art. He could speak, as everybody who had lived long enough could speak, on the wonderfully-improved taste of this country in all that related to the art of the common articles of everyday household use, particularly with regard to textiles. He himself was a manufacturer in a provincial town forty years ago, and thirty years ago he was an exhibitor at the Exhibition of 1851. Some of the best products that were exhibited at that time would, if now brought together and exhibited, furnish a "Chamber of Horrors," as far as art was concerned, that would rival anything that Madame Tussaud could show. When he thought of the curtains with large baskets and sprays of flowers on them, of the carpets with lions and other animals depicted on them, of the fearful and wonderful designs that exhibited themselves upon the walls of our houses, and of the furniture whose only characteristic was massiveness, he was disposed to be very tolerant indeed of those so-called "æsthetes" who were just now the subject of so much satire and ridicule. Modern æstheticism, even when it became a little effeminate, was infinitely better than the coarseness which prevailed thirty or forty years ago, and for his own part he would rather see a man worshipping a blue pot than worshipping a pink pot. He was quite sure that the somewhat sombre colours now used were better than the colours which were seen in drawing-rooms some years ago, together with a tremendous blaze of gilding and ponderous ornaments. When he (as one of the Royal Commissioners) was in Paris in 1878 for the opening of the Exhibition, he remembered standing in the international street, —the Rue Internationale,—when the preparations were completed, and while the representatives of the different nationalities were keeping secret the art-treasures they had to show. Seeing an inscription in the Fine Arts section, "École Anglaise," some of the French artists exclaimed, "The English School! There is no English school!" He spoke to his friend Sir Frederick Leighton, who was the friend of all artists, about the *badinage* to which the English representatives were being subject on account of the inscription referred to. Sir Frederick replied, "Wait until the opening day: they will then see whether there is an English school or not." When the opening day arrived he saw some of the great French artists stand almost aghast at the display of English art made at the Exhibition. As a lover of art, he preferred the modern English school to any other modern school. The English school was the only real school of landscape in existence. Since the revival of modern English art by Reynolds, Gainsborough, and Hogarth, England had made wonderful progress in art. Art had become a necessary part of the home life of all cultivated people. The jaded politician, and the hard-worked professional or business man, each and all felt that their lives were softened and humanised by art. Artists, then, had great claims upon the community. They must have every faculty in full and healthy play if they were to be successful. The eye must be keen, the hand steady, and the head clear, and should any sense or faculty fail, the cunning on which the artist was dependent for his daily bread must fail with it. Connected with the institution which they had met together to support was the Artists' Annuity Fund. By subscribing to it artists provided for themselves in sickness and old age, but while making this provision it sometimes happened that the bread-winner disappeared from life's scene, leaving behind him a wife and children. It was then that the Artists' Benevolent Fund came forward and gave assistance to those who were left to face the cruel mercies of the world. During the past year the institution had given annuities to sixty-five widows and fifteen orphans, the amount so expended being 1,316*l*. The year, he was glad to see, had not been an unprosperous one. He might mention that one lady, Miss L. Pye, herself the daughter of an artist, had added 500*l*. to the fund for widows, and also given 100*l*. to the Institution in lieu of further annual subscriptions.

The toast having been acknowledged by Mr. J. Absolon, and the health of the chairman drunk on the proposition of Mr. Willmore,

The Secretary (Mr. Lambton Young), read out a list of donations amounting to more than 1,200*l*., in which were included 100 guineas from the Queen, and 100*l*. bequeathed to the fund by Miss Landseer.

Mr. Forbes Robertson proposed "The President and Members of the Artists' Annuity Fund," for whom Mr. Willmore responded, urging the claims of the fund on young artists. He expressed regret that, with the increase in the number of artists, there had not been a corresponding increase in the number of members of the Annuity Fund.

Mr. W. Cave Thomas, in proposing "The Royal Academy," said that whatever critics might say of it, gratitude was due to it for having kept alive the traditions of art during the Arctic period of taste corresponding to the earlier part of the present century. He urged that the Academy should not, however, rest content with meeting the wants of modern taste, but should endeavour to elevate and refine that taste. He referred in terms of satisfaction to the mark of distinction just conferred by her Majesty upon the Society of Painters in Water-colours,—henceforth to be known as the Royal Society of Painters in Water-Colours, and he trusted that it would be the object of the Society, as well as of the Academy, to show to the public what should be the highest aim of art.

Mr. J. H. Mole proposed "The Honorary Physicians and Medical Officers," coupled with the name of Mr. E. Symes Thompson, who briefly acknowledged the toast.

Professor Guthrie, in proposing the next toast, "The Artists' General Benevolent Institution, and the Societies connected with the Fine Arts," said it was his good fortune to be able to reckon amongst his intimate friends some of the men who stood highest in the scientific world, and he could assure the assembly that the higher one went in the ranks of science the greater was the appreciation of the graces of art. Why should it not be so? That man who had most faithfully watered the root called Truth, who had most diligently tended the stem called Knowledge, must surely be able to appreciate the flower called Art. There were those who would put into two separate and even hostile camps the adherents of Science and Art, ignorant of the fact that the two were co-terminous and co-existent, pervading everything,—both of them,—that was worthy of the contemplation of the human being. He therefore implored the scientific man not to shut his eyes to the mystic graces of art, and, on the other hand, he urged the artist not to close his ears against the sweet, solemn harmonies of natural truth.

The only other toast was "The Ladies," proposed by the chairman.

FROM ABROAD.

Dr. Schliemann.—The celebrated discoverer of Troy and Mycenæ, who has presented to the Berlin Museum the invaluable relics he found at Ilium, was recently made an honorary citizen of Berlin by the municipal authorities of that capital. It was resolved to invite Dr. Schliemann to a *soirée*, to take place on Thursday, the 7th inst., in the Berlin Town-hall, on the enrolment of that gentleman in the list of Berlin citizens. The address welcoming the *savant* in his new capacity was to be delivered by the well-known physiologist and politician, Dr. Virchow.

Building Exhibition at Brunswick.—An important exhibition of tools and materials employed in building in Germany was opened by commission on the 1st of July, in the name of the Duke of Brunswick.

The Gewandhaus at Leipsic.—The Leipsic Gewandhaus or Cloth-hall, which is best known in England and other countries on account of the important musical performances which have for many years taken place within its walls, will this year celebrate the four hundredth anniversary of its original foundation. The building arose in the latter half of the fifteenth century in consequence of the growing trade of Leipsic and the increasing importance of its fairs coupled with the necessity of a sheltered place for the transaction of business in textile fabrics and other commodities. The existing building, however, is not the original one, but was erected after its destruction in 1740. The celebrated Gewandhaus concerts will hereafter be given in another building.

Seats and Trees for the Streets.—Lord Brabazon has given the sum of 50*l*. to the National Health Society for the purpose of placing seats and planting trees, in suitable positions in London, for the benefit of foot-sore pedestrians.

ROYAL ITALIAN OPERA-HOUSE: RUBINSTEIN.

HERR ANTON RUBINSTEIN'S opera, "Il Demonio," appears to be considered by many a great success, and is drawing the public, but whilst admiring some doubtless very fine music which it includes, we should be glad to find in it a little melody, or at least an air or two that we could remember with pleasure. We looked for a gleam of sunshine, whereas the whole opera suggests one terrific thunderstorm, with the exception of the ballet music, which is light and graceful.

The singing of Madame Albani as the heroine, and of M. Lassalle as the "Demon," was magnificent, and the choruses were very finely rendered. Angels' visits are proverbially few and far between; this is to be the more regretted just now, as the charming Madame Trebelli made appearance in that rôle (we trust not her last), her inimitable voice and fine presence being, as ever, welcome. The scenery and appointments are admirable, and the costumes of the ballet, although not exactly becoming, are picturesque. Herr Rubinstein has long been a great favourite in London, but has never before so completely laid hold of the public as now. We know as a fact that he took away with him for three of his recent Recitals at St. James's Hall over 2,000*l.*, and, as the total result of his two months' visit to London, not far short of 12,000*l.*! The sums paid to the most prominent foreign musicians and singers are enormous. Madame Nilsson, for example, will not sing in an oratorio for less than 250 guineas, and Madame Patti requires half as much again. Admit that these two ladies have attained the highest position in their profession and as public favourites (and these things are not always synonymous), it must still be allowed that they make us pay dear for their whistle. Too often an enterprising *entrepreneur* who has been fortunate enough to persuade High Talent to sing for him, finds, when he has paid High Talent's high price, the orchestra, the hire of the room, and the fees of the subsidiary singers, very little left to reward his enterprise.

FROM FOREIGN AND AMERICAN SERIALS.

Wiener Zeitung (Vienna, June 21).—On the 21st of June a meeting was held in the hall of the Austrian Institute of Architects and Engineers, to establish an Austrian Sanitary Association. A committee was appointed, composed of sanitary inspectors, town councillors, civil engineers, and scientific men, to carry out the object of the society, which is to promote sanitation, both generally and locally.

La Revue Industrielle (Paris, June 29).—A premium of 25,000 francs has been offered by the King of the Belgians for the best paper upon a complete and economical water service for large towns. The quality of the water is made an important point, and the system has to be calculated to meet the growing demands of an increasing population. The premium will be awarded in 1882. Belgians alone can compete, but the papers cannot fail to prove of general interest.

The Iron Age (New York, June 2).—Referring to the insecurity of iron columns and girders in case of fire, a plan is mentioned which has been recently patented in America. This is to fill the columns and girders with water, a communication being made between all the columns in a building, and an escape-pipe being carried through the roof, and left open to the air. It is suggested that if this were done the columns would stand perfectly firm, even if the building were consumed.

The New York Herald.—Writing on the subject of employment for women, this paper says that many of the branches of decorative art have been successfully undertaken by them, especially in the West. Amongst these is wood-carving, by which work a lady in St. Louis is said to have earned over 500*l.* last year. This town and Cincinnati appear to take the lead in offering facilities to women for undertaking this class of work; and in the latter place a private female school of wood-carving has been established, and is meeting with great success. In the Cincinnati School of Design, there were lately 138 female students to 17 male in the wood-working classes; whilst at a recent exhibition of woodwork at this school, out of 156 specimens, 138 were executed by women.

The Mechanical Engineer (June 18).—A report is published of the meeting of the Polytechnic Association of the American Institute, held on June 2nd, at which Mr. Partridge gave a review of ancient and modern inks. He explained that the former were, as a rule, intensely black, and almost indelible by time or chemical action; but that, as their bases were chiefly carbon and gum, they were easily removable by washing. Modern inks, on the contrary, are chemical blacks, and resist washing; but they are easily removed by chemical means, and being largely composed of iron salts, fade with time. Mr. Partridge was of opinion that much blame was laid upon ink for faults of the paper written upon, as he believed that the chemicals remaining in the paper had much to do with the change of colour. Aniline inks of all kinds are objectionable, being very fugitive: some of them even show signs of fading within a year or so. Logwood inks are also to be avoided; for, although they write very black at first, they are liable to change from the slightest causes. For simple durability,—where there is no fear of the writing being tampered with,—there is nothing better than Indian ink, which can easily be made to flow freely, by the addition of a little carbonate of ammonia.

The Scientific American (New York, June 25).—In a paper on "The Problem of Healthy Water," the difficulties and uncertainty of water analysis are discussed, and it is pointed out that the great desideratum is a practical and trustworthy determination of the substances contained in water which are capable of fermentation. This might be effected by the use of different reagents, and the various animal and vegetable forms could be classified as harmless and harmful.

BUILDING LAND AT WANSTEAD FLATS.

A SHORT time ago, about nine acres of land, in close proximity to Wanstead Flats, were awarded by the umpire, Sir Arthur Hobhouse, Q.C., in settlement of Mr. George Borwick's claim against the Commissioners of Epping Forest. Subsequently to the award, it became known that the intention was to lay out the land and dispose of it in small plots for the erection of cottage property and artisans' dwellings, which it was feared would depreciate the value of larger houses in the locality around. In order to prevent this, negotiations have been in progress with a syndicate composed of gentlemen locally interested in the district, the result of which is that the land in question has just been sold to those gentlemen by Mr. William Houghton, of Old Broad-street, for the sum of 9,000*l.*, being at the rate of 1,000*l.* per acre. The purchase has been made solely with the view of preventing the land being let in small plots, and it is understood that it will shortly be re-sold in lots suitable for the erection of residences of the villa class.

SMOKE ABATEMENT.

THE Board of Trade has officially declared the Exhibition of Smoke-Consuming Apparatus, Fuel, &c., to be held at South Kensington, from October 20th till November 26th, to be "calculated to promote British industry and prove beneficial to the industrial classes," thus conferring protection on all inventions exhibited during the time of exhibition, and for six months afterwards (in virtue of the Protection of Inventions Act, 1870). The Secretary of the Admiralty, Mr. Trevelyan, has also forwarded a communication promising that the Admiralty will favourably consider applications for trials of apparatus at one or another of the dockyards, in case the size and character of the appliances should in particular cases exceed the capabilities of the testing places already provided.

These communications were read at a special meeting of the committee, Mr. Ernest Hart in the chair. Present among others, Sir Frederick Pollock, bart., Sir A. Brady, Lady Borthwick, Miss Shaw Lefevre, Prof. Roberts, F.R.S.; Mr. Atchison, Miss Kate Potter, and Mr. W. R. E. Coles, hon. sec. At the same meeting it was resolved that a public meeting should be held to report progress and to inform the public and all interested of the forward state of the existing arrangements, and a hope was expressed that the Duke of Westminster, would allow the meeting to be held at Grosvenor House. It was mentioned that, in addition to premiums conferred by the committee, a series of extra prizes would be arranged, including a ladies' prize for the best smoke-consuming domestic grate, and that Mrs. Rathbone, of Kensington, had headed the latter prize with a subscription of ten guineas.

PICTURES PURCHASED BY THE ART-UNION OF LONDON.

THE following is a list of the principal works selected by the prize-holders of 1881:—

From the Royal Academy.—At Last, Arthur Stocks, 290*l.*; The Naughty Boy, C. T. Garland, 150*l.*; At Newark Priory, Surrey, F. W. Hulme, 150*l.*; Shelter: A Rainy Day, Walter Hunt, 75*l.*; Backwaters, Hurley-on-Thames, Chas. Smith, 76*l.*; A Ferry on the Trath at Tan-y-Bwlch, J. Jackson Curnock, 60*l.*; Dolgaroy Mill, South Wales, Chas. L. Saunders, 45*l.*; Yorick and the Young Hamlet, W. K. Stevens, 35*l.*; Stoke, Suffolk, Robt. W. Fraser, 30*l.*; Treasures, M. Goodman, 30*l.*; "Well, Pussy!" Haynes King, 30*l.*, Clouding Over: A Valley in North Wales, John Whipple, 30*l.*; Parting Day, W. Ayerst Ingram, 26*l.* 10*s.*; Spring-time: Isle of Wight, W. Sidney Cooper, 25*l.*; Mending the Net, Edwd. Elliot, 25*l.*

From the Society of British Artists.—A Visit from Brother Dominie, W. Dendy Sadler, 100*l.*; The Village Bridge, P. Macnab, 70*l.*; Stormy Weather: on the Mole at Leatherhead, C. Gibbs, 60*l.*; Every Little Helps, C. S. Lidderdale, 50*l.*; Some one Passing, Haynes King, 45*l.*; Prayer, Wm. H. Weatherhead, 45*l.*; Heroes, C. Cattermole, 40*l.*; Amongst the Rocks and Ferns, E. Holmes, 40*l.*; Mammy's Pocket, J. C. Waite, 40*l.*; Breezy, G. S. Walters, 40*l.*; A Parley, A. W. Bayes, 35*l.*; On the River Mole, W. H. W. Foster, 35*l.*; Sunshine, E. Holmes, 35*l.*; Barrow-on-Trent, James Peel, 35*l.*; "When the wind is in the East, then the Fishes bite the least," W. Dendy Sadler, 35*l.*; A Highland Drove, Geo. Turner, 35*l.*; The Silvery Thames by Shiplake Island, W. H. Gosling, 30*l.*; A Gipsy Nymph, J. Gow, 30*l.*; Bolton Abbey, N. E. Green, 30*l.*; A Breezy Day, P. Macnab, 26*l.* 5*s.*; Deer in Richmond Park, Sir R. P. Collier and W. Severn, 25*l.*; The *Times*, Haynes King, 25*l.*; Cattle in the Marshes, W. Luker, 25*l.*; The Pairing, J. C. Waite, 25*l.*; Evening on the Thames, G. S. Walters, 25*l.*; Flotsam and Jetsam (a Sketch from Nature), W. Hemsley, 21*l.*; The Globe Room at the Reindeer Inn, Banbury, G. R. Clarke and C. Cattermole, 20*l.*; On the Upper Thames near Godstow, W. Gosling, 20*l.*; Taking Advantage of Granny, Miss A. Grant, 20*l.*; Pets, E. Hume, 20*l.*

From the Royal Albert Hall Gallery.—St. Michael's Mount, Cornwall, S. Hodges, 46*l.*; "The Curfew tolls the Knell of parting Day," A. Morris, 40*l.*; "Scarce a Gleam of azure Heaven," J. Anderson, 35*l.*; Watering Horses, Miss M. E. Greenhill, 35*l.*; Walsh Hall, near Coventry, J. Anderson, 30*l.*; First at the Trysting-place, Miss E. Turck, 20*l.*; Shrimpers on the Beach, Evening, G. A. Williams, 20*l.*

From the City of London Society of Artists.—Covenanters on their Way to Prison, Miss E. Connelly, 42*l.*; Ardvorlich, Loch Lomond, J. J. Bannatyne, 20*l.*; A Rat, H. H. Couldery, 25*l.*; The South Downs, near Eastbourne, Alfred Powell, 25*l.*

From the Society of Painters in Water-Colours.—Sheep feeding, Winter, Edward Duncan, 75*l.*; Conway Bay, S. P. Jackson, 36*l.* 15*s.*; Azalias, Mrs. Angell, 35*l.*; Llanstephan Castle, S. P. Jackson, 31*l.* 10*s.*

From the Institute of Painters in Water-Colours.—The sacred Island, "Philæ," on the Nile, Chas. Vacher, 48*l.* 6*s.* At Lustleigh, Devon, J. H. Mole, 30*l.* 10*s.*; The Ford, Chas. Cattermole, 21*l.* 5*s.*

From the General Exhibition of Water-Colour Drawings.—Awaiting Sentence, F. G. Cotman, 35*l.*; "Where the Reeds and Rushes quiver," W. G. Addison, 30*l.*

THE LONDON SANITARY PROTECTION ASSOCIATION.

AMONGST the new companies registered last week is one giving to itself the above designation. The objects of the association, as stated in the deed of registration, are to provide inspection and advice with a view to ensure and maintain the proper sanitary condition of buildings; also to promote sanitary science by the collection of data, statistics, and information, and to diffuse the knowledge so acquired by lectures, meetings, and exhibitions, and by printing and publishing the same. No capital is named in the deed, which states that the association is registered under a licence by the Board of Trade as being "limited by guarantee, and not having a capital divided into shares," on condition that no portion of the income or property of the association shall be paid "directly or indirectly by way of dividend, bonus, or otherwise howsoever, by way of profit to the members of the association."

THE CHURCH OF ST. MARY OVERIE.

WITH reference to an observation in our recent notice of Mr. Dollman's book, that gentleman says,—You refer to my representation of the original thirteenth-century groined roof as conjectural. When the oak roof (which had been erected in 1469, after the fall of the original roof) was removed, *circa* 1831, traces of its predecessor were brought to light, and on drawings, by Mr. Gwilt, showing the longitudinal section of the old nave (the walls of which were not finally destroyed till about 1838, the building remaining between 1831 and 1838 a

roofless ruin) indications of the wall ribs of the original groining are shown, and some of the stumps of the groining above the vaulted shafts also appear, so that I had data for showing the height and design of the original roof, in addition to which there still exists a fragmentary stump of the original groining on the north and south sides of the nave, adjoining the tower, which, with the piers of the arcading of the old nave, were left standing, probably for constructional security, when the rest of the nave was taken down in 1838.

On several drawings by Gwilt I find sections of the oaken ribs belonging to the roof of 1469, as well as accurate plans of the groining of that roof (shown on plate 19 in my book).

FIGURES AND FANCIES.

THERE is a peculiarity about the date of the present year of Grace which may afford materials for those who are seeking for omens and portents in these terrible times, and which, so far as we know, has not before been pointed out. The date 1881 reads the same either from left to right or from right to left, as it does also if read upside down. Some thousands of years must elapse before it will be possible to say the same thing again,—not, indeed, before the year of our Lord 8008. Eighty years hence, namely in 1961, it will read the same upside down, but not, as in the present case, from left to right and right to left.

The figures of the current year, 1881, are divisible by 9, giving 209 as result, and added together the four figures make 18, also divisible by 9, or making 9 when added together.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

2,653. W. Barton, Boston. Stoves. June 17, 1881.

2,662. A. M. Clark, Chancery-lane. Manufacture of cements, &c. (Com. by E. E. A. Sorel, Paris.) June 18, 1881.

2,686. A. Damman & A. Cassard, Brussels. Parquet flooring. June 20, 1881.

2,743. H. H. Lake, Southampton-buildings. Construction of pavements, &c. (Com. by D. McLean, New York, U.S.A.) June 22, 1881.

2,751. D. Church, Southwark. Forming joints in leaden pipes, &c. June 23, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

June 21, 1881.

702. G. Butler, Chiswick. Floor-Cramps. Feb. 18, 1881.

705. F. W. Fletcher, Westminster. Metal substitute for putty. Feb. 18, 1881.

769. H. Lecornu, Caen, France. Apparatus for Cooking and Heating. Feb. 23, 1881.

1,302. T. Parker, Coalbrookdale. Grates and Stoves for burning Anthracite Coal, &c. March 23, 1881.

1,564. R. Wild, Littleborough and H. Ledger, Leek. Treating and Purifying Sewage, &c. April 11, 1881.

June 24, 1881.

926. G. Maw & A. Maw, Broseley. Decorating Bricks, Tiles, &c. March 4, 1881.

1,091. A. M. Clark, Chancery-lane. Tiling for roofs, floors, &c. (Com. by J. J. Williams, Fairhaven, U.S.A.) March 14, 1881.

1,714. C. R. Stevens, Lewisham. Heating and cooking by gaseous, liquid, or solid fuel, &c. April 20, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending June 25, 1881.

4,647. S. Mayell, Rochester. Apparatus for sifting Portland cement.

Sieves are used, which are made to revolve rapidly, and thus the cement is strained or sifted. Nov. 11, 1880. Price 6d.

4,684. T. J. Constantine, Fleet-street. Furnaces, ranges, &c.

Various streams of air are directed into the fire to consume the smoke. The door is formed with four parallel plates, and the air entering the bottom of the outer plate is led up and down between these plates until it passes into the fire from the top of the inside plate, being greatly heated in the passage. Small streams of air are also led along the sides of the fire-basket, also becoming heated in the passage, and discharged into the fire at the back. The "bottom-plates" of furnaces are also made to introduce air in the same manner. The upper surfaces of the fire-bars are grooved so that the fine ashes may lodge therein and act as a non-conductor of heat. Nov. 13, 1880. Price 6d.

4,722. F. Wirth, Frankfort-on-the-Main. Manufacture of bricks for building.

To make bricks which shall be extremely light and at the same time quite firm, the following substances are used,—Pulverised cork, clay or sand, hydrate of lime, and soluble glass: to these a suitable quantity of hair and fibre for binding purposes and sufficient water are added. (Com. by C. Grunzweig & P. Hartmann, Ludwigshafen-on-the-Rhine.) Nov. 16, 1880. Price 6d.

4,735. D. Brown, Huddersfield. Syphons and traps for sinks, drains, &c.

This syphon traps the foul air or vapours from the drain, whether there be water in the syphon or not, in the following manner. In the induct-pipe is formed a globular space in which is a ball of any buoyant substance, coated with indiarubber, of a larger diameter than the pipe. When there is water in the syphon, this holds the ball against the induct-pipe mouth, and when there is no water in the syphon the ball rests on the educt-pipe mouth, closing the syphon in both positions. Nov. 17, 1880. Price 4d.

4,762. J. Sawyer, New North-road. Register stoves, &c.

A combustion-box is fitted at the back of the stove, fitted with flues by which the products of combustion are led to the box, and there consumed by fresh currents of air. (*Pro. Pro.*) Nov. 18, 1880. Price 2d.

4,959. H. A. Bonneville, Cannon-street. Bricks for borders of paths, walks, &c.

This is an improvement on Patent No. 4,323 of 1878 in moulding the brick with an arch at its base, so that when the bricks are placed side by side they form a tunnel answering the purpose of a drain-pipe for water (Com. by E. Beaucantin, Rouen). Nov. 29, 1880. Price 4d.

SANITARY PLUMBING.

SIR,—There is a trite saying in some parts,—"Nae siller, nae sense,"—which is pretty often acted on as a truism in many of the relations betwixt employers and employed; but, although Mr. Hellyer and Mr. Smeaton may enjoy a considerable share of the former, yet I trust they do not even desire to monopolise the latter; indeed, Mr. Smeaton admits as much when he says there is no finality in any one man's teaching,—inclusive, doubtless, of his own. Therefore it is that I as a workman, in laying claim to a little of the latter commodity as the result of twenty years' practical experience, would like to offer a few remarks on the subjects about which Mr. Hellyer has already spoken.

To begin with the wiping of joints. I quite agree with Mr. Smeaton as to the soundness and durability of what are called "Scotch" or "Yankee" joints; and apparently the Scotch and Yankee peoples must do likewise, since they find the joints to answer all their practical purposes, which are quite as varied and as important as those of London. If there be no difference, then, in utility, the question of superiority must lie in economy of material, taste in shape, and ease in making. To take the last point first. I rather think that the long joint is the easier to make, as you have a greater body of metal to retain the heat while it is being made; and, with regard to the second point, it must evidently be a matter of individual opinion, my own being that the short joint, the longitudinal section of which approaches the form of an ellipse, with solder proportionate to the strength of the pipe, is much neater; and, in respect of the third point, much more economical than those long joints which are too often to be found wiped bare a considerable way inwards from the cleaning. In the case of brasswork with short linings, the bulk of the solder in long joints extends along the solid pipe, away from the junction where the strength is really required, thus being a palpable absurdity and the very reverse of what ought to be, since the tinning on brass is not so adhesive as that upon lead.

The same remarks may be applied to branch-joints in all positions and sizes, that is, the joint should take the elliptical form, and the size be proportionate to the strength of the pipe. I think that joints as recommended by Mr. Hellyer create a waste of solder, much of it being superfluous. As an example, he shows a 1½-in. joint about 4 in. long, which to my thinking would be equally effective, much neater, and more economical at 2¾ in. or 3 in. in length. What "sense," I would ask, consists in putting such a mass of metal on a waste, overflow, or soil pipe? True, sometimes the plumber, in his zeal for economy, puts it only half-way round the pipe, as in one I lately witnessed taken out of a large house in the west of London, the joint being tinned all round and well formed in the front, while the blade of a knife could be passed through the junction at the back. About the making of joints in a single heat or without the use of the plumber's iron, I have only to say that I trust the former is neither a rarity in Mr. Hellyer's experience, nor the latter a rarity in that of Mr. Smeaton.

The manner of making bends on light lead pipes is also subject to variations of opinion. I think Mr. Hellyer quite right in maintaining the use of the "dummy," so far as in bending any size of pipe from 3 in. upwards; while at the same time, I think the "traveller" to be more useful in the smaller sizes; but I doubt very much if either Mr. Hellyer or Mr. Smeaton would allow sufficient time to the workman to make the substance of the outer and inner parts of a bend of a uniform thickness, and, indeed, even then its certainty could not easily be ascertained without cutting. The method of throwing a deep "kink" into a bend before dummying, as many plumbers do, is highly objectionable, as it tends to thicken the lead at one small spot, and to form "buckles" which cause a considerable loss of time in re-dressing. It is much better, in seeking uniformity, to bring the bend up gradually, bending and dummying frequently. With regard to the heavy pipes used in ship-plumbing, I may state that I have seen many and made many bends of varied and tortuous forms with the large bolt and fore-hammer, for scuppers, bilge-pumps, &c., and that under the conduct of men of the highest standing in their art.

Undoubtedly the very best bend is that which is drawn, in the same manner as the patent pipes or the American P or S traps. They are perfectly equal in substance, but as bends are required in all manner of lengths and shapes, it is not always found practicable or advisable to use them. Hand-made bends with one or two drawn seams, may be made very easily, very equal in substance, and of any length or shape, with the exception of making the one bend at right angles to the other, while at the same time, you have a better choice of material; many of the patent pipes being of very inferior metal, which will sound like a bell on being tapped with a mallet, and, in fact, is sometimes so brittle as to break across on being bent. The hand-made bends are used by some of our most eminent sanitary engineers, and, to my thinking, have only one fault, which is, that where acids abound, the seams are liable to rapid corrosion; but to this evil inferior patent pipes are equally liable. A good bend may also be made by splitting the end of a pipe and proceeding as in the ordinary seamed bend, the loss of substance in the circumference of say a 4-in. pipe being only about 2 per cent.

As far as practical purposes usually require, bends may be made on small and moderately stout pipes, without either "dummy," "bolt," or "traveller"; but I question very much the ability of any plumber to do so and retain the original bore at the throat,—it being understood that the pipe is to be filled with neither water, sand, resin, nor any other substance,—since it is evident the bend must be dressed from the outside, and the slightest deviation from the circular form of the bore will materially lessen the area.

I quite concur with Mr. Hellyer as to the general necessity of traps in the present state of plumbing science, but I also hold that there are certain conditions under which the trapless closet may be used with safety; but I think that in the application of those conditions, a greater amount of discrimination is necessary than is usually possessed by either workmen or their foremen.

JOHN WHITELAW.

LECTURES ON PLUMBERS' WORK.

SIR,—I take the liberty to claim a word on this subject, having been a plumber as far back as to have to walk over the old London Bridge to work. It is the duty of our class to afford Mr. Samuel Hellyer every support in his lectures for giving such general information and outline, not only in making up various classes of actual work, but system and affinities in metals.

He must have had more than the general experience as a working man in the trade proper. His lectures, particularly in house-plumbers' work and ventilation, are quite comprehensive, and I should say will cause improvement in various sanitary points under the Health of Towns Act. It is not the place for plumbers to criticise, and many will agree that in the execution of work there are things to hit upon that do not come within the reach of drawings or specifications. I give the lecturer very much credit for his bold attempt before some of the best plumbers.

THOMAS PARE, Torquay.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

THE CHAIR OF ARCHITECTURE, UNIVERSITY COLLEGE.

THE Council of University College have appointed Mr. T. Roger Smith the Professor of Architecture, and, at the same time, have recognised the valuable services of Professor Hayter Lewis by conferring upon him the title of Emeritus Professor.

OBITUARY.

The Late Mr. Frederick Ouvry.—The lamented death of this gentleman, which took place recently at the age of sixty-five, demands a note in these pages, if for no other reason than that Mr. Ouvry had long acted as Honorary Solicitor for the Royal Institute of British Architects, and notwithstanding his large and important practice as a member of the well-known firm, Farrer, Ouvry, & Co., of Lincoln's-inn-fields, was always ready to afford his advice. He acted also in the same way for the Royal Literary Fund, and, as one of the treasurers, was seldom absent from the meetings of that important and admirable charity. In a similar honorary capacity, as a Life Trustee of Sir John Soane's Museum, his services were always to be had, and always prized. Professionally, Mr. Ouvry acted, amongst numerous other important appointments, as the confidential adviser of Messrs. Coutts & Co., the bankers, and the value attached by the firm to his services is shown by the incident that, a few years ago, after the payment of his annual account, one of the firm handed him a blank envelope containing a cheque for 1,000*l.* Mr. Ouvry was a vice-president of the Society of Antiquaries at the time of his death, and, previously, had served for a time as president of that important society, between the presidency of the late Earl Stanhope and that of the Earl of Carnarvon, who now worthily fills it. Mr. Ouvry had suffered for some time from an internal complaint, and about two years ago resided for some months in Egypt with apparent advantage. At the funeral, which took place at Acton, and where there was a large attendance of private carriages, the Institute of Architects was represented by its officers, Mr. Macvicar Anderson and Mr. William H. White.

BUILDING A HOUSE ON A SAND HILL.

MR. J. J. DE KINDER recently presented the following communication at a meeting of the Engineers' Club of Philadelphia. We take it from the American *Gas Light Journal*:—

As I am not aware that it has ever before been attempted in the United States to build a house on the very top of a lofty sand-hill, exposed to all winds and weather, while simply depending upon, or rather by simply making the loose sand the agent to keep it firmly secured in its seat, I think a few words upon the construction of a signal station which I have just finished for the Maritime Exchange of this city, on top of the highest sand-hill of Cape Henlopen, may be of interest to some. The signal station mentioned will serve to report the arrival at, and departure from, the Breakwater of all passing vessels, to the Philadelphia Maritime Exchange by means of the Western Union Telegraph lines, which connect it with this city.

In the first place, it was necessary that the observer stationed in the building should have a clear and unobstructed view of the seaward horizon from south to north,—that is, seaward of the coast line. To obtain this it was necessary to erect the building on top of a hill which rises some 80 ft. above the level of the sea. But the building thus necessarily becomes exposed to every gale that sweeps that part of our coast, while it is absolutely required that it shall stand firmly planted in such a way that even a hurricane shall not shake it or make it tremble, as that would affect the sight of the telescope in the observatory.

The usual mode of securing is by building a foundation of screw piles, or of heavy timbers sunk into the sand. The latter mode has this disadvantage, that if the wind shifts the sand away from around the foundation, it becomes undermined, and its effect is thus destroyed. In order to be independent of all this, I designed what I consider a cheap and, at the same time, an effective anchorage for the building, in the following manner:—The building is of wood entirely. It has a cellar, above which are two rooms, one above the other, and the whole surmounted by the observatory proper. First, the ground sill is a square of 20 ft., made of yellow pine sticks, mortised together, and pinned with stout trunnels. The sill of the observatory is made likewise of heavy timbers, 12 ft. long. The two sills are joined together by four stout yellow pine corner posts, which in turn are mortised into both sills. The posts are 26 ft. in length; 5 ft. above the lower sill is the sill which supports the floor of the first room; 10 ft. above this is the sill which supports the upper room. Both these sills again are mortised into the corner posts. This structure is sheathed outside with German siding, inside with rough boards covered with felt, and again by tongued and grooved yellow pine boards. The observatory proper, octagon in shape, is securely mortised into the top sill, and is covered with a corrugated iron roof, conical in shape. The cellar is floored with 3 in. wood, and boarded all around on the inside of the posts. I first dug a pit in the sand, about 6 ft. deep and fully 20 ft. wide, on the bottom; I then laid the ground or cellar sill on this bottom, and built the structure; thus the whole depth of the cellar is sunk below the top of the hill, or the level of the sand. I then filled the cellar up solid with sand, and packed it solid all around the outside also; consequently the building is anchored in its place by the load in the cellar, some 100 tons in weight. I carried three heavy joists (part of the joists which carry the floor) through on one side of the building, and on these the kitchen was built, so that this is also independent of the sand under it. Since the construction of the station we have had some very severe blows, yet there is no more tremble in the building than if built of stone on a rock.

A few feet from the building stands a signal-post or mast, 100 ft. high, which carries a 5-ft. ball of rattan covered with canvas. The ball is made to slide on the mast, and is used to answer signals from vessels by raising and dropping it. As it would, in my opinion, be a rather dangerous thing to simply place a mast in the sand,—no matter how deep,—I sank a well into the sand-hill. This well is made of pine, 20 ft. deep and 8 ft. square. The mast is placed in the centre of the well, and is braced, from the corners of the pine box, by some twenty stout braces, and the well afterwards filled and tightly packed with sand inside and outside, so that, like the house, to blow it over would necessitate the moving of a tremendous weight of sand with it.

ASPHALTE CARRIAGEWAY PAVEMENT.

At a recent meeting of the Streets Committee of the Commissioners of Sewers for the City of London, the following tenders were received for paving the roadway of Queen Victoria-street, from Mansion House to Cannon-street, area about 5,500 square yards:—

Name of Contractors.	First cost per sq. yd.	Maintenance for two years free of cost to commissioners, and for 15 years (after two years expired), measured over the entire surface, at per sq. yd. per annum.	Total cost of pavement to commissioners at expiration of 17 years at per sq. yd.
French Asphalte Co., 27, Cornhill, E.C.	13s. 6d.	1s.	28s. 6d.
Limmer Co., 85, Gracechurch-street, E.C....	13s. 6d.	8d.	23s. 6d.
Val de Travers Co., Old Broad-street, E.C. ...	13s. 10d.	6d.	21s. 4d.

The Committee recommended the acceptance of the lowest tender; and it should be further mentioned that at the expiration of seventeen years the pavement is to be left in as good a state and condition as when first laid down, and with a smooth and even surface.

Castleford, Yorkshire.—Further considerable additions are being made to Red-hill House, the residence of Mr. John Austin, J.P. The style of the buildings is Elizabethan, with stone dressings to all the windows and the main entrance, also a stone terrace to the front; and lead glazing to the top part of the windows. The contractor is Mr. Thomas Hemsley, of Carlton, near Selby. New workmen's cottages, with stabling, are to be built, the style of which will be Elizabethan, with stone dressings. The gables have ornamental barge-boarding and plaster cove to the eaves. The architects are Messrs. W. Lewis & Son, Stonegate, York.

THE LIVERPOOL LANDING-STAGE.*

THE accumulation of sand on the site of the landing-stage, opposite George's Pier, in the river Mersey, is no new thing. The northern end of Pluckington Bank always accumulates with quiet weather and neap tides. During the time of the old landing-stage, the boat occasionally grounded on this bank at low water of spring-tides. The writer has been down on the old landing-stage (about 1841-2), say at six o'clock a.m., at dead low water of a spring-tide, when the timber-barge at the outer end of the then landing-stage was aground on hard, dry, sand; but, the evening following, a south-westerly wind having been blowing at the same point, the boat was afloat in some 15 ft. depth of water, the tidal or rather outer-river scour having removed this bank to this extent in twenty-four hours. The weight of sand disturbed and moved by the tidal waters of the Mersey during rough spring-tides is something enormous. On the end of the small slip at the southern end of Princes Dock parade, the writer has known 12 in. vertical of sand to be deposited by one tide. During all rough spring-tides the great sandbanks outside, and the shore-deposits of sand within the river, are disturbed and shifted; the estuary sailing channels are altered, and new but only temporary conditions are brought into play. If there has of late been a continuance of smooth weather in the Mersey, during spring-tides, this may account for the greater temporary extension, northwards, of Pluckington Bank. A renewal of tolerably south-south-western gales, during times of low water of spring-tides, will, however, again, as formerly, sweep away this bank from beneath the stage-pontoons, without the aid of costly and most dangerous sluicing. The southern pier to the George's Dock basin rests on timber piles, and the writer has been under this pier amongst the piles, the sand having been washed away by injudicious sluicing in the basin. Rubble stone was thrown under and against the foot of this pier to cause the sand to accumulate, and care was taken not to allow the sluicing again to be directed against this pier. The whole of the site of the pier in question, of the river-wall in front of the baths, and of the area beneath the baths, was difficult ground,—a sort of quicksand,—so that to construct large sluices on this ground may prove to be a most dangerous, costly, and inefficient game; and, after all, Pluckington Bank may pay no attention to the sluicing operations when established. The Dock Trust is, however, rich, and may therefore be allowed to make ducks-and-drakes of a few thousands, or even tens of thousands, of pounds, and nobody care much about it. It may, however, be wiser to let flushing by powerful sluices alone, and rather to push the landing-stage further into the river, lengthening the connecting bridges, so as to secure deeper water and a fuller scour at all times of the tide. CIVIL ENGINEER.

WERE GIPSIES THE DISCOVERERS OF THE STOURBRIDGE FIRE-CLAY?

SIR,—The appearance in your number for June 25th of an interesting article on "Lye Waste and its Nailers" induces me to repeat a query that I have already addressed in several quarters without obtaining any satisfactory answer,—Were the discoverers of the Stourbridge fire-clay,—not Huguenot refugees from Hungary and Lorraine, but—Gipsies? According to the current tradition, given in Kelly's "Worcestershire Directory" (1872), they were tent-dwelling musicians; and from Mr. H. S. Grazebrook's "Collections for a Genealogy of the Noble Families of Henzey, Tyltery, and Tyzack" (1877), it appears that their descendants were dark-haired (p. 31), and that their ancestors were natives of Bohemia,—*Bohémien* being the French for "Gipsy." That they are styled "noble" need raise no difficulty, since instances abound of Gipsy dukes and earls, received as such by European magnates in the sixteenth and seventeenth centuries. On the other hand, there are several reasons for admitting the probability of my guess. In Denmark an unexplained name of descendants of Gipsies is *Glarmestere* ("glaziers"); and in Norway is a burial-place of Gipsies, who are said by tradition to have made bottles. In England, in the reign of Charles I., we find coupled together "chapmen, peddlers, *glassmen*, tynckers, palmesters,

* See the *Builder*, p. 6, *ante*.

fortune-readers, Egiptians, and the like"; and in the Potteries, in 1879, "half-gipsies" were employed in placing the pattern-mark on beer-mugs. The wandering "Potters" and "Muggers," too, of the Border shires at the present day have certainly a drain of Gipsy blood in them, employing, as they do, a good many Gipsy words; and the same holds good of wandering "Nailers," whom I have met in Wales. A good many other arguments, slight enough in themselves, but possibly worth something when taken in the lump, may be found in a late book of mine,—"In Gipsy Tents." The point, however, on which I have failed to satisfy myself is the antiquity of the tradition itself, on which my theory chiefly depends. If the discoverers of the Stourbridge fire-clay were really tent-dwelling musicians, it almost follows that they were not Huguenot refugees, but Gipsies. Can any of your readers carry back that tradition later than 1830?

F. HINDES GROOME.

"KING INA'S PALACE."

SIR,—With reference to Mr. Parker's letter in your issue of last week, asking for information as to the Mediæval house at South Petherton, Somerset, known as King Ina's Palace, I am glad to be able to say that I possess among my collection of examples of ancient domestic architecture, two photographs taken three days before the alterations were begun, in which the details are very clearly shown.

The first bears the note, "South-west view of King Ina's Palace, South Petherton, taken June 19, 1862. Restoration begun June 23, 1862." The second, "South-east View," with the same dates. I have also a photograph of the alterations while in progress, and another of the house when ready for occupation.

These photographs can be seen at my office, No. 18, Fenchurch-buildings, E.C., and I shall have pleasure in submitting them to Mr. Parker in any way that may be convenient to him.

It is much to be desired that a society should be organised to bring together carefully measured drawings of interior work, such as the well-known ones by Mr. Birch and Mr. Spiers, of the houses destroyed a few years since in Lime-street.

The privately-printed details of the house of Mr. Palmer, at Yarmouth, is also an excellent example of the work needed.

In the portfolios and sketch-books of our older architects there must be many interesting records of destroyed buildings, that might be usefully collected, and perhaps be made better known by photography, or other inexpensive mode of reproduction.

To my own knowledge, valuable drawings of public interest passed not long since into the hands of a waste-paper dealer.

ALFRED E ROBERTS.

THE WOOD CARVING AT THE HOUSE OF MR. LEOPOLD DE ROTHSCHILD, HAMILTON PLACE, W.

THROUGH the kind influence of Mr. J. Jackson, of the firm of Messrs. Jackson & Son, Rathbone-place, Oxford-street, the wood-carvers of London obtained, as you suggested they should, special permission last Saturday afternoon, from three to five, to see the work at the house of Mr. Leopold de Rothschild, a notice of which has already appeared in the *Builder*. Two hundred cards for admission were distributed by the Secretary of the Society of Wood-carvers, the majority of whom visited the house, and expressed their admiration of the work that has been done. The work in the library well sustains the character for which the Italian wood-carvers are well known, both for design and execution. At the same time, great credit is due to the firm of Messrs. Jackson & Son for the work that has been done by them, which will bear favourable comparison with any other work in the style; in fact, the whole of the work, so far as we were able to judge on Saturday, not forgetting the marble work by Mr. Forsyth, and the plaster decoration of the upper rooms by Messrs. Collinson & Lock, deserve great praise, and were very much admired. We hope to be allowed to see the work again when everything is finished.

W. SANDILANDS,
Secretary, Society of Wood-Carvers.
149, *Great Titchfield-street.*

ASHBURNHAM HOUSE.

SIR,—Mr. Philip Webb, in his letter to you (p. 30) implies, though he does not expressly state, that the question whether Inigo Jones was the architect of Ashburnham House must be decided solely by considerations of style. It is, I believe, the fact, though I have not yet had opportunities of examining the authorities at first hand, that no documentary evidence is at present producible on either side of the question. Nothing is known as to the year in which the house was built, though, as was suggested by a writer in the *Saturday Review* for March 19th, its history could probably be worked out from the records of the Chapter.

The biographers of Inigo Jones do not include the house in their lists of his works, nor is it mentioned by Walpole. So far as I know, all modern books ascribe the work to Inigo, but I believe that this attribution dates from about the beginning of this century only. If by Jones, the silence of his biographers as to so beautiful a work is remarkable. But there is still greater difficulty in assigning it with reasonable probability to any other architect. Every one, I think, will agree with Mr. Webb that it cannot be ascribed to Wren. But the school was very limited in number; to which of the followers of Jones or Wren could this exquisite design be allotted? It may, however, be, that the collections of Jones's drawings contain evidence on the points hitherto overlooked. Cunningham, in the "Handbook of London," seems to have carefully examined Inigo's drawings at Worcester College, Oxford, but not "some boxes of architectural drawings in the possession of the Duke of Devonshire." Have the latter ever been carefully studied? It is not impossible that direct evidence may be produced connecting Inigo Jones with Ashburnham House; meanwhile, the letter of Mr. Webb is valuable as conveying the opinion of an expert, given after careful study of the building.

ALFRED MARKS.

ARCHITECTS AND QUANTITIES.

SIR,—Your correspondent, "C. P." (p. 30), is displeased with my observations on this subject in your issue of June, 18. I ask any impartial reader if the same were not amply justifiable in answer to the challenge made to architects in the letter by "Quantity Man." "C. P." should read it. I accepted the challenge, and my combatant is, I feel sure, satisfied that it was at least an indiscretion on his part to assume such heroism. Doubtless, from "C. P.'s" point of view, my letter "would have been better unwritten." The facts, however, remain, and I am rather surprised that "C. P." should consider such statements of facts equivalent to throwing "mud" at surveyors. I hope "C. P." has not been touched in a vulnerable point.

In conclusion, I would inform "C. P." that I never attempt to take out quantities, nor do I profess to be able to do so, so that I have no hesitation in replying that "the contents of the 'snugly-packed nutshell' would have been less (considerably so) if 'H. H. B.' had carried out the work."

H. H. B.

*** We have received several letters on this subject, but do not find it desirable to print them.

THE ENGLISH LAND SYSTEM.

SIR,—It is simply absurd to maintain that the Land Laws are accountable for the depressed state of agriculture in this country. I hold my farm on lease at a low rent, and I assert it has been an impossibility to pay my way for the last five years without great loss, or for the last two rent free. I do not know what sort of seasons they have been in France, but from my knowledge of that country I should not advise any one to go there to learn farming, as the science is conspicuously deficient, and the small farmers are too poor to buy proper implements.

I have never seen 1,000 acres in England reserved specially for sport.

A YORKSHIRE FARMER.

VARIORUM.

"RHYMES in Council: Aphorisms Verified," is the title under which the veteran *littérateur* Mr. S. C. Hall, F.S.A., has issued * 185 reflections "based on experience, and matured by thought: the proceeds of a long life." They are remarkable for good sense, good taste, and good feeling, and include an enormous amount of useful teaching, pithily and pleasantly conveyed. We take one of the reflections almost at hazard to show the character of the lines:—

"Work! SELF-HELP is the Law that governs man;
The base and ground-work of God's perfect plan:
His will is that we work for what we ask;
Work with our hands or head: nor shirk the task.
Work! work! that with a boon a blessing brings:
Work is the lot of all created things,—
The earliest mandate of the King of Kings!"

There is not one of them that can do anything but good. We print a second. If it should lead only one of our readers to reflect and act in the right direction, the book will already have done good work:—

"What is the Drunkard's life? A life of pain,
Of sin, of sorrow, self-reproach, and shame,
Of home-affliction: evil wants, that drain
The home-resources: leave a filthy stain
On all its sacred ties: dishonour'd name!
Friends, estimate the loss, and count the gain!
Shun, as a plague, THE DRINK; a glimpse of light,—
It may be,—heralding a dismal night."

"Rhymes in Council" with the special sanction of the Queen, is dedicated to her Majesty's grandchildren, and we augur for it a long series of editions.——To the current number of *The Nineteenth Century* the well-known antiquary and writer, Mr. William J. Thoms, contributes a delightful paper entitled "Gossip of an Old Bookworm," wherein he shows, among other things, the riches he has gleaned during a long life from old bookstalls, and laughs to scorn those who have said that no one ever found anything worth having in the "sixpenny box." It is a charming gossip, full of erudition and genial remarks on old friends. Good and kind himself, he remembers only the goodness and kindness of those with whom he has had to do. It is to be hoped Mr. Thoms will be induced to continue his pleasant and instructive memories. ——Philip's "New Map of Middlesex, with portions of the adjoining Counties," by J. Bartholomew, F.R.G.S. (Philip & Son, London and Liverpool), is an admirable production of its kind. It is on a good scale, the writing very clear, and appears to be altogether satisfactory.

* Griffith & Farran, St Paul's Churchyard. 1881.

Miscellanea.

New Docks at Greenwich.—In addition to the Bill which has already received the sanction of Parliament for the construction of new docks at Dagenham, in Essex, a Bill has been passed by both Houses authorising also the construction of docks in the triangular-shaped promontory extending on the south side of the Thames, from Greenwich, by Blackwall, to near Charlton. A short line of railway is proposed to connect the docks with the Greenwich and Woolwich line of the South-Eastern Railway, and thus bring them into direct communication with the Great Northern, Midland, and Great Western Railways, *viâ* London Bridge and Ludgate-hill stations.

Eton Officers' Memorial Fund.—Over 1,400*l.* has now been received or promised in aid of this fund, which has been set on foot to commemorate the Eton officers who fell in the recent South African and Afghan campaigns. Plans for a memorial screen have been prepared by Mr. Street, R.A. These have been submitted by the Committee to the College, which has expressed its approval of them, and its desire, if possible, to facilitate the work by the removal of the present organ. Instructions have been given to the architect to furnish the Committee with specifications.

The Electric Light in Edinburgh.—At a meeting of the Town Council of Edinburgh last week it was unanimously agreed, on the recommendation of the Cleaning and Lighting Committee, that Princes-street, the North Bridge, and Waverley Bridge be lighted with the "Brush" electric light, as an experiment, for three months, at a cost of 389*l.*, and that the Committee have power to light Holyrood Palace-square with the same light during the Queen's visit in August.

A Wooden Palace.—The Japanese papers report that a new palace for the residence of the Mikado is about being built at Yeddo, which will be entirely of wood, and will cost 5,600,000 yen (nearly 1,120,000*l.*). There will be, however, a grand reception-hall, in which all grand State ceremonies will be performed, which is to be built partly of tiles and partly of wood, at an estimated cost of 170,000 yen (about 34,000*l.*)

The Scott Memorial Brass, Westminster Abbey.—We are asked to state that the memorial brass which is being placed over the grave of Sir George Gilbert Scott in Westminster Abbey, by public subscription, and which is from the designs of Mr. Street, R.A., will be uncovered by Dean Stanley on Wednesday next, the 13th inst., at twelve o'clock, when it is hoped that a few of the subscribers and friends may be able to be present.

Wimbledon Camp.—Messrs. Defries & Sons, of Houndsditch, have again been entrusted with the contract for lighting the Camp for the National Rifle Association, at the forthcoming meeting.

Southport.—Three stained-glass windows have been erected in All Saints' Church. The central four-light east window is an illustration of the "Te Deum," containing groups of figures representing the Angels, Apostles, Prophets, Martyrs, and the Holy Church. The principal tracery contains a figure of Our Lord seated in majesty, and the smaller traceries the four Archangels and groups of Cherubim and Seraphim. This window is flanked on either side by a two-light window; that to the north contains, beneath rich canopies, figures of SS. Matthew and Mark, and the tracery above, a seated group of Faith, Hope, and Charity. The window on the south side has figures of the other two Evangelists, SS. Luke and John, and in the tracery another seated group representing Temperance, Justice, and Fortitude. The windows were designed and executed by Messrs. Shrigley & Hunt, of Lancaster and London.

Tramways.—Major-General Hutchinson, of the Board of Trade, visited Portsmouth on Saturday afternoon, and officially inspected the Cosham tramway extension, which is now completed for more than half the entire distance, and passed it, the work, which was contracted for by Mr. J. Sheppard, of Chetwynd-road, Dartmouth Park, Highgate, being described as quite satisfactory.

Statue of Mr. Gladstone.—A statue of Mr. Gladstone, executed by Mr. Albert Bruce Joy, will shortly be sent to the foundry at Thames Ditton, and when cast in bronze will be set up in the East-end of London. It is presented to the citizens of London by Mr. Theodore Bryant, of the firm of Bryant & May, and is over 9 ft. in height.

Hammerwood Church, East Grinstead. Messrs. A. J. Arrowsmith & Co. wish it to be mentioned that the parquet floor in the chancel, carved oak reredos with illuminated letters, &c., and the carved oak communion-table in this church, were executed by them.

Royal Recognition.—The Queen has been graciously pleased to direct that the Society of Painters in Water-colours shall be henceforth called the Royal Society of Painters in Water-colours.

TENDERS

For covered homestead, Woodlands Farm, near Leatherhead, for Mr. F. C. Bryant. Mr. E. Saunders, architect:—

Lee, Cobham	£12,123	0	0
Dove Bros.	11,859	0	0
Rice	10,489	0	0
Hamblin Bros.	10,000	0	0
Batchelar	9,819	0	0
Woodward	9,500	0	0
Goddard	9,485	0	0
Messam	9,191	0	0

For the erection of four villa residences, Shoot-up-hill, Cricklewood, for Mr. Geo. King:—
J. F. & E. Van Camp, Kilburn (accepted).

For residence, Broadlands-road, Highgate. Messrs. Lander & Bedells, architects:—

Kerry	£2,579	0	0
Grover	2,549	0	0
Ebbage	2,497	0	0
Williams & Son	2,473	0	0
Mattock Bros.	2,393	0	0

For proposed church, Margate. Messrs. Lander & Bedells, architects:—

J. J. Wise	£4,559	0	0
J. W. Hobern	4,245	0	0
G. S. Rolfe	4,130	0	0
Frost & Co.	4,055	0	0
Paramor & Son	3,900	0	0
G. H. Denne	3,781	0	0
Bushell & Son	3,751	0	0
W. H. Woodward	3,686	0	0
Jones & Co.	3,664	0	0
Lewis Shrubsole	3,650	0	0
W. J. Beale	3,637	0	0

For St. Saviour's Church, Woolcot Park. Mr. J. Bevan, architect. Quantities supplied:—

Church	£5,699	0	0
Crocker	5,636	0	0
Lewis & Edbrook	5,532	0	0
Veals	5,515	0	0
Stephens & Bastow	5,498	0	0
Wilkins & Sons	5,290	0	0
Davis	5,252	0	0
Forse	5,250	0	0
Eastabrooke & Sons	5,249	0	0
Howell & Sons	5,139	0	0
Cowlin (accepted)	4,839	0	0

For alteration of house, Stanstead-road, Forest-hill, into two shops for Mr. Osborne. Mr. S. Brookes, architect, Croydon:—

Taylor, Croydon	£640	0	0
Lee, Penge	640	0	0
Beadle, Penge	554	0	0
Jones & Whiffen, Beckenham	533	0	0

For additions and repairs at Nos. 8, 46, and 48, Ladywell Park, Lewisham, Kent, for Mr. Dalton T. Miller. Mr. Edward Clark, architect:—

MacFarlane Bros.	£893	0	0
Tarrant & Son	882	0	0
Mattock Bros.	793	0	0
G. & S. Fisher (accepted)	549	0	0

For the erection of schools in Shirehall-yard, Ipswich, for the Ipswich School Board. Mr. Brightwen Binyon, architect:—

W. Grayston, Ipswich	£6,479	0	0
R. Girling Ipswich	5,965	0	0
J. B. & F. Bennett, Ipswich	5,892	0	0
R. S. Smith, Ipswich	5,687	7	0
D. C. Jones & Co., Gloucester	5,642	0	0
G. Grimwood & Sons, Sudbury and Ipswich (accepted)	5,575	0	0

For erection of villa residence at Westcombe Park, for Mr. A. T. Foreman:—
Balsam Bros. (accepted).

For alterations and additions at Blenkinsopp Castle, Greenhead, near Carlisle, for Captain Wm. Blenkinsopp L. Coulson. Mr. Wm. Glover, architect:—

W. Scott (mason's work)	£325	0	0
W. Scott (carpentry and joinery)	202	13	0
Walker & Emley (plumbing)	142	5	6
W. Scott (plastering)	57	3	0
J. Richardson & Co. (painting and glazing)	13	17	3

For the erection of a pair of semi-detached residences, in the Station-road, New Barnet, Herts. Quantities by Mr. E. Crutchloe:—

Nightingale	£2,683	0	0
Pocock	2,627	0	0
Roberts	2,539	0	0
Noble	2,420	0	0
Gregory	2,137	0	0
King & Son (too late).			

For taking down and rebuilding two shops and residences, situate in the High-street, Sevenoaks, for Messrs. Hills & Stepney:—

Durtnell	£1,570	0	0
Wallis & Clements	1,348	0	0
Willicombe & Oakley	1,250	0	0
Wiltshire (accepted)	1,200	0	0

For labour only in the erection of a warehouse and residence (exclusive of boundary-walls) at Magnet Wharf, Stratford, for Messrs. Benj. Iles & Co. Messrs. Hills & Fletcher, architects:—

Lewin	£538	0	0
Wallis & Clements	500	0	0
Boutter & Loel	434	0	0
Gunning, Bromley (accepted)	395	4	0

Accepted for the erection of business premises for Mr. Hanford, Matlock Bank. Mr. John Nuttall, architect. Quantities by the architect:—
W. Askew, Matlock (masonry, &c.).
John Wood, Matlock (joinery, &c.).

Accepted for additions and alterations to the Horse Shoe Hotel, Matlock-green, for Mr. Thos. Evans. Mr. John Nuttall, architect:—
W. Askew, Matlock (masonry, &c.).
Joseph Robinson, Matlock (carpentry, joinery, &c.).

For first portion of detached house at St. John's-road, Eastbourne. Messrs. William Reddall & Son, architects:—

Honnsom	£3,050	0	0
Peerless	2,563	0	0

For new warehouse at rear of 33½, King's-road Chelsea, for Messrs. Osborn & Shearman. Mr. C. Bovis, architect:—

Brass	£794	0	0
Smith	769	0	0
Lathey Bros.	730	0	0
C. Wall	718	0	0

For sewer works to be executed at the rear of Peckham Park-road and Station-road, Camberwell, for the Vestry of St. Giles's, Camberwell. Mr. F. C. Reynolds, surveyor:—

Peckham Park-road:—			
Bottom	£374	0	0
Stubbs	325	0	0
Harris	295	0	0
Butler	275	0	0
Wilkes & Co. (accepted)	261	0	0
Station-road:—			
Bottom	£272	0	0
Wilkes & Co.	138	0	0
Stubbs	120	0	0
Butler	116	0	0
Harris (accepted)	112	0	0

For new schools at Upper Norwood, for the Croydon School Board. Messrs. Rutley & Blackwell, architects. Quantities supplied:—

	Buildings.	Fittings extra.
Ward	£5,138 0	£355 0
H. Legg	5,009 0	725 0
M. Taylor	4,978 0	695 0
Larter & Son	4,889 0	770 0
G. Williams	4,940 0	672 0
W. Marriage	4,750 0	625 0
Holliday & Stuart	4,517 0	592 0
Smith & Son	4,471 0	628 0
Hearle & Son	4,438 0	625 0
J. C. Bowyer (accepted).	4,296 0	647 0

For rebuilding premises, No. 23, Goodge-street, Tottenham-court-road, for Messrs. Bedford & Co. Mr. C. Carter, architect. Quantities supplied by the architect:—

Bywater	£2,145	0	0
Foxley	1,707	0	0
Wilson & Exton	1,450	0	0
Langmead & Way	1,300	0	0
Godden	1,297	0	0

For alterations to premises at Blackheath, for Mr. Burnside. Mr. Andrews, architect. Quantities not supplied:—

Blow	£580	0	0
Wilson & Exton	447	0	0
Bevan & Dorman	397	0	0

For new front and alterations to the "Waterman's Arms," Penge, for Mr. Charles Wilson. Mr. S. Brookes, architect, Croydon. (Cabinet, counter, and gas-fittings not included.)

Syme & Duncan, Beckenham	£615	0	0
Bristy, Croydon	570	0	0
Lee, Penge	555	10	0
Loe, Croydon	545	0	0

For town-hall, Fenny Stratford, Bucks. Mr. Fred. Gotto, Leighton Buzzard, architect:—

Brown, Buckingham	£1,379	0	0
Spencer, Atherstone	1,395	0	0
White, Dunstable	1,300	0	0
Smith & Son, Olney	1,218	0	0
Esau George, Stantonbury	1,200	0	0
Gates & Taylor, Fenny Stratford	1,131	0	0
Whiting Heath, Leighton Buzzard	1,000	0	0
Stanniford, Fenny Stratford	947	10	0

For laying a pipe sewer, with Stanford's patent joints, along the Wimborne-road, Bournemouth, for the Bournemouth Commissioners. Mr. G. R. Andrews, surveyor:—

Hoare, Bros. & Walden, Bournemouth	£366	12	6
George James, Bournemouth	340	0	6
C. Stickland, Bournemouth	313	17	0
C. A. D. George, Bournemouth	295	0	0
Saunders & White, Bournemouth (accepted)	283	12	6

For painting the undermentioned schools, for School Board for London. Mr. E. R. Robson, architect.
Canal-road, Hoxton:—

Williams & Abrigail	£490	0	0
Boyce	359	0	0
Prayer	344	0	0
Cox	341	0	0
Shurmur (accepted)	333	0	0

Wellington-street, Hoxton:—

Williams & Abrigail	£511	0	0
Boyce	383	0	0
Patchard	368	0	0
Cox	359	0	0
Vigor	337	0	0
Shurmur (accepted)	324	0	0

Hindle-street, Shacklewell:—

McCormick	£312	9	0
J. W. Smith & Son	284	0	0
Boyce	279	0	0
Sargeant	258	0	0
Darby	230	0	0
Shurmur (accepted)	207	0	0

For basement and foundations of the New Art Galleries, for the Piccadilly Art Galleries Company, Limited. Mr. E. R. Robson, architect:—

W. Webster	£4,330	0	0
Higgs & Hill	3,443	0	0
Peto Brothers	3,053	0	0
Mark Manley	2,950	0	0
G. Trollope & Sons	2,893	0	0
Wall Brothers	2,871	0	0
G. H. & A. Bywaters	2,749	0	0
Kirk & Randall	2,741	0	0
J. T. Chapple	2,685	0	0
W. Brass	2,696	0	0
Holland & Hannen (accepted)	2,598	0	0
If 10 weeks allowed instead of 8 weeks:—			
Higgs & Hill	£2,980	0	0
J. T. Chapple	2,900	0	0
Peto Brothers (12 weeks)	2,497	0	0

For the erection of a house and farm buildings, and additions to Sutton Court School, for his Grace the Duke of Devonshire. Mr. Henry Currey, architect:—

Roberts, Chiswick	£2,435	0	0
Adamson & Sons, Turnham-green	2,125	0	0
Arundell, Grove Park, Chiswick *	2,075	0	0

* Accepted.

For new shop front, fittings, and decorations at No. 208, Regent-street. Mr. Geo. Edwards, architect. No quantities supplied:—

Jefferies	£1,598	0	0
McLachlan & Sons	1,427	0	0
Richardson	1,165	0	0
Goad	1,163	0	0
Green	1,098	0	0
Drew & Co.	1,098	0	0
Saunders	1,070	0	0
Stimpson & Co.	1,064	0	0

For alterations and additions to house, Endless-street, Salisbury, for Mr. S. Hill. Mr. Fred. Bath, architect:—

Edward Witt, Salisbury	£310	0	0
E. Young & Sons, Salisbury	249	0	0
Gilbert Harris, Salisbury (accepted)	225	0	0

For residence at Milford, near Salisbury, for Mr. E. J. Orchard. Mr. Fred. Bath, architect. Quantities supplied:—
Edward Abley, Salisbury (accepted).

For manager's house at Fordingbridge, near Salisbury, for the Executors of the late Mr. J. R. Neave. Mr. Fred. Bath, architect:—

John Wort, Salisbury	£985	10	0
Arthur Read, Ringwood	748	0	0
E. Young & Sons, Salisbury	680	0	0
Sharland & Griffin, Wimborne	610	0	0
Thomas Clark, Fordingbridge	596	12	6
John Sherisg, Fordingbridge *	567	0	0

* Accepted.

For three dwelling-houses on the Milford Manor Estate, for Mr. E. Berry. Mr. Fred. Bath, architect:—

E. Young & Sons, Salisbury	£2,148	10	0
Edward Abley, Salisbury	1,826	0	0
E. Tomkins, Salisbury	1,712	0	0
Wm. Soruse, Salisbury	1,670	0	0
John Wort, Salisbury (accepted)	1,652	10	0

For repairing and painting the Admiral Napier, Weddington-road, for Mrs. Wright. Mr. H. J. Newton, architect:—

Wood	£249	0	0
Veara & Co.	210	10	0
Pickersgill Bros.	197	10	0
Walker (accepted)	185	0	0

For pewterers' work at above:—

Hellings	£127	5	0
Heath (accepted)	113	0	0

For new counter at the Lord Clyde, Rochester-row, for Mr. Silcock. Mr. H. J. Newton, architect:—

Sanders & Son	£174	0	0
Heath	169	0	0
Moody	162	0	0
Edwards (accepted)	149	13	6

For pulling down and rebuilding warehouses, Nos. 134 and 135, Curtain-road, for Messrs. Light & Co. Mr. R. Creese Harrison, architect. Quantities by Mr. A. J. Gate:—

Robinson	£13,333	0	0
Falkner	12,950	0	0
Higgs & Hill	12,940	0	0
Ashby & Horner	12,350	0	0
Conder	12,293	0	0
Clarke & Bracey	12,190	0	0
Perry & Co.	12,129	0	0
Greenwood	11,973	0	0
Patman & Fotheringham	11,965	0	0
Colls & Sons	11,900	0	0
Morter	11,879	0	0
Dove Brothers	11,855	0	0
Ashby Brothers	11,784	0	0
Brass	11,683	0	0
Woodward	11,639	0	0
Lawrence	11,554	0	0
Toms	11,537	0	0

For building a villa residence in St. Germains-road, Forest-hill, for Mr. W. H. Morson. Messrs. Wilson, Son, & Aldwinckle, architects:—

Higgs	£1,487	0	0
Amer	1,280	0	0
Bowyer	1,175	0	0
Taylor & Sons	1,056	0	0

For building six shops in the High-road, Woodford, for Sir Thos. White. Messrs. Wilson, Son, & Aldwinckle, architects. Quantities supplied:—

Morter	£2,878	0	0
Perry	2,850	0	0
Outhwaite	2,798	0	0
Beale	2,771	0	0
Shurmur	2,745	0	0
Higgs	2,432	0	0
Wells	2,387	0	0

For alterations at the Masons' Arms, Battersea Park-road, for Mr. E. Purchase. Mr. H. J. Newton, architect. Quantities supplied:—

Beale	£2,937	0	0
Gill	2,879	0	0
Burman	2,537	0	0
Walker	2,380	0	0
Gibbs & Flew	2,378	0	0
Haylock	2,340	0	0
Wood	2,297	0	0
Mattock Brothers	2,127	0	0
Davis	1,975	0	0
Pickersgill (accepted)	1,950	0	0

For rebuilding 61, Lisson-grove, for Messrs. Spencer, Turner, & Boldero. Mr. A. Peebles, architect. Quantities by Mr. W. E. Stoner:—

			Fittings in oak instead of deal.
Lawrence	£2,830	0	£120 0
Morter	2,816	0	123 0
Perry & Co.	2,753	0	115 0
McCormick & Son	2,2[illegible]	0	82 0
Mark	2,145	0	34 0

For an inn at Hove, for Messrs. Vallance & Catt. Messrs. Lainson & Son, architects:—

Lockyer	£1,494	0	0
Garrett Bros.	1,450	0	0
Barnes	1,387	0	0

For the erection of a dwelling-house in Parchment-street, Winchester, for Mr. J. Titheridge Galbraith, architect. Quantities supplied:— Mr. Aug. W.

Goodwin	£831	0	0
Marsh	809	0	0
Mackin	797	0	0
Grimwood	792	0	0
Scaley	775	0	0
Carter & Son	753	0	0
Fielder & Son	730	0	0
Humphreys	717	0	0

For erection of cottages, Loudwater, Bucks, for Mr. George Long. Mr. Arthur Vernon, architect:—

Bagley	£736	10	0
Child	632	0	0
Carter	610	0	0
Gibson	569	0	0
Corby	523	0	0
Nash (accepted)	522	10	6

For new temperance hall, Blackwell-heath, Bucks. Mr. Arthur Vernon, architect:—

Corby (accepted)	£115	0	0

For additions, Borshams, Wycombe. Mr. Arthur Vernon, architect:—

Loosley (accepted)	£450	0	0

For shop-front, 345, Mare-street, Hackney. Mr. Charles Daneh, architect:—

Trent Bros.	£180	13	0
Shurmur	175	0	0
Drew & Cadman	159	0	0

For alterations to the Barley Mow, Rotherhithe. Mr. Geo. Legg, architect:—

Kent	£1,260	0	0
Buller	1,198	0	0
Shurmur	1,183	0	0

For alterations, &c., 84, Kingsland High-street. Mr. Cotton, architect:—

Shurmur	£780	0	0
Jackson & Todd	765	0	0
Hayworth	579	0	0

For alterations, &c., at Green-gate Tavern, Hackney-road. Messrs. Bird & Walters, architects:—

Shurmur	£728	0	0
Ockley	715	0	0
Marr	687	0	0
Larter & Son	680	0	0
Williams & Son	673	0	0
Mark	650	0	0
Jackson & Todd	610	0	0

For alterations and additions to two houses, Broadsby's Walk. Mr. Fred. Messon, architect:—

Shurmur	£886	0	0
Wood	879	0	0
Devereux	865	0	0

TO CORRESPONDENTS.

J. J (thanks for letter) —A. H K. (thanks for letter) —B Bros. (should have sent names and amounts) —M. & L. (shall appear soon). —F. W. (next week.)—Veritas (we have no further information).—W. S. (shall have attention). M. (no) —W S H. J N. J H P.—M. & Co.—W. S. & A.—M A.—W S.—A M F C.—W. G. H I N.—E S H C Bros.—H A H W L & Son.—T P. W.—J.—F & H G R W.—A Y A W O E T.—J D H G B. J. G. B.—W W., jun.—R. W. G.—W & R. M.—L. & B. J. B.—H & F.—S. G. J.—J N.—W. B. & Son.—W. & Co.—E. F., jun.—W. L. & Son.—L. Bros.

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Notes on Roman Mosaic Designs.

In one corner of the Architectural Court at South Kensington, in the centre of which stands the cast of one of the most remarkable monuments of Roman greatness in arts and arms, is a not much noticed stand of drawings on a turning frame, which illustrates very largely the character of Roman art in one very beautiful and interesting class of work. These are the drawings collected by Dr. Wollaston, and presented to the Museum by Mrs. Wollaston, of Greek and Roman mosaic designs. The Greek designs, however, form but a small portion of the whole, the majority are Roman. The originals of a few of the examples hang in the corridor running down the centre of the Architectural Court; the originals of a good many others, including some of the best specimens, are in that cellar at the British Museum, reached by a staircase from the Græco-Roman court, to which so few visitors go, and where it is so difficult to see most of the specimens properly when one does go. A considerable number of the Wollaston drawings also illustrate specimens of mosaic, the originals of which are not in England, or not accessible to the public.

The variety in taste and style, as well as in merit, of these designs, is rather remarkable when we regard them collectively, and not less remarkable is the extent of resemblance we frequently find to some later school of design not generally supposed to be much connected with Roman influence. That there should be close resemblances between Roman and Renaissance design is, of course, natural, but we find new phases in the relations of the two styles when we consider mosaic, compared with what we find in considering Roman architectural carved ornament. The first drawing in the Wollaston set which we happened to turn to, for instance, a pavement found at Orbe, in Switzerland, looks singularly like a Renaissance ceiling design turned into a floor. The exactly reverse operation has, no doubt, been the origin of some of the Renaissance ceiling designs,—they have been suggested by Roman mosaic pavements. At present we only know of a few scattered examples of Roman mosaic, such as the one now referred to, which might suggest this form of panelled ceiling with little designs in brighter colour in the principal panels. But at the time of the Renaissance there might have been more numerous examples, of which many have perished since. The transplanting of the design from floor to ceiling is natural enough. Mosaic floors were not in such general use at the Renaissance period as to render it a natural thing to reproduce the Roman mosaic in the same position. The style of design shown in imitation panels in the Roman mosaics became reproduced in the real panelling and painted decoration of the Renaissance ceiling.

No one can doubt the connexion who looks at this and some other mosaic designs in the Wollaston drawings. But a more unexpected resemblance to some characteristics of Saracenic work is to be traced, and seems to us to have passed unnoticed. In a pavement from Fliessem, in Rhenish Prussia, is to be found precisely the arrangement which is common in many of the best specimens of Saracenic wall diaper; the arrangement of hexagons with squares subtending each side of the hexagon and filling up the intervening spaces. This pavement, indeed, suggests the idea that some one had got hold of a Moorish design and translated it into Classical detail. We are not accustomed to connect Saracenic work with Roman in any historical sequence; yet this strong resemblance can hardly be accidental. If one Roman design of this type has been found preserved to this day, we know not how many there may have been about in the times when Saracenic art took its rise, or how far the details of the latter may have been influenced by Roman forms which have passed away leaving hardly any traces. A large-scale diaper pattern which fills up the border of this Fliessem pavement is also very curious and semi-Oriental in style when regarded as Roman work, though it is not so much without its resemblances in other known Roman examples. It is an illustration of the liking of the Romans for patterns composed of curiously-intercepted segments of circles, a type also common in Saracenic work. Another design found at Fliessem is a remarkably fine instance of this, a very elaborate combination of circles and hexagons. Mosaic, in fact, lends itself so well to the working of what may be called puzzle-patterns that it is not surprising to find a good many of these among Roman mosaics. Sometimes, as in the case of a black and red design from Nantes among the Wollaston drawings, the patterns have the appearance of a kaleidoscope arrangement,—representing, it must be admitted, ingenuity rather than art. In fact, as we have observed, almost every degree of merit is found, from rough work which is commonplace enough both in its idea and its workmanship, to grand and bold design which represents almost the finest decorative character that can be obtained in mosaic, except for the want of that finish and neatness in laying which seems especially the characteristic of modern mosaic work.

Some people will consider the comparative roughness and irregularity of the Roman specimens an artistic advantage; and perhaps, when a mosaic design is on a large scale, and covers a considerable area, it does gain in effect by a certain degree of roughness and irregularity of line, and the appearance seems in keeping with the method and nature of the material. At all events, this rather irregular character of Roman mosaic should be taken into account when forming a judgment of the appearance of a design from drawings only. It is an almost ineradicable habit of draughtsmen, in making a drawing of antique ornamental work of this kind, to reduce it all to symmetrical neatness in every detail, and thereby a wrong impression of the effect of the original is conveyed. The difference between the effect of a drawing of this kind, and of the real work, is very perceptible on comparing the fine floor mosaic from Halicarnassus, which fills great part of the front room of the Græco-Roman cellar of the British Museum, with the drawing of it in the Wollaston collection. The drawing, for example, represents the border design of leaves growing from alternate sides of an undulating stalk as completely regular and symmetrical, and as if drawn out with the aid of compasses, whereas, in the original, the work is apparently put in by eye, or with the roughest measurement only, and is considerably irregular. In some other specimens in the British Museum this want of regular spacing and lining is so marked as to become a positive defect, and very disagreeable to the eye.

Besides the combination of intersecting arcs of circles, we find, as the most prevalent form in Roman mosaic ornament, a zigzag border, formed by alternate pyramids of dark and light, the joining-line giving the zigzag effect, in a manner similar to some forms of Celtic ornament. Various forms of the square Greek fret are found, few of them equal to the best Greek examples, however; in one instance, a piece of pavement found at Cotterstock, and now hanging on the wall of the Roman court at the British Museum, the Greek fret is used in a diagonal or lozenge shape, not very common in Roman work, and not at all Roman in appearance. A favourite form of diaper ornament, we regret much to have to say, is a design showing cubes shaded so as to appear in perspective, and as as if standing up edgeways from the floor-plane. Nothing could be in worse taste or look worse; and it is curious that this false taste for imitation relief seems to have beset the Roman mosaicist even in the middle of otherwise excellent work. Among the specimens from Carthage, in the British Museum cellar, for instance, is a large piece of very good and tasteful floor diaper, formed of rhomboids and squares, perfectly flat in appearance; but surrounding this is a border, the principal space of which is shaded so as to look like successive ridges and hollows. It does not seem to belong to the centre design in taste at all. The bead and reel ornament is frequently found, usually on rather a large scale; but it must be confessed it does not look effective in

flat work, where it loses the effect obtained by shadow on the surface and between the beads. But the favourite ornament of the Roman mosaicist, especially for borders and for marking the lines of construction, is the guilloche or intersecting rope pattern. This is forthcoming nearly everywhere; sometimes as a border, sometimes following all the main dividing lines of the floor pattern, sometimes carried out as a diaper twisting all over the surface, as in one very ingeniously devised specimen in the cellar at the British Museum. It shows a want of invention that we should find such constant repetition of a pattern requiring so little thought; but it must be admitted that it always looks effective, and suits mosaic work very well. Another ornament which occasionally occurs affords another link between Roman and comparatively recent ornamental schools; for here and there among the designs among the Wollaston drawings, and in one or two of the original specimens at the British Museum, occurs that same form of radiating scolloped ornament, something like a fan, which became such a favourite in the late Renaissance period in England, though in the Roman examples it appears, of course, shaded, and not in relief. A very favourite ornament, in medallions and circles, consists of a kind of intertwined loop or knot forming a cross; this belongs to the same class of ornament as the guilloche, but is even more commonplace, and much less effective, and certainly not worth introducing as a central ornament in the circles of a large floor design, as it often is introduced. Perhaps the finest of all the designs in the Wollaston drawings of this class of detail, is the pavement found in Shropshire, and consisting of a geometrical design of intersecting squares forming each a star shape, with octagons enclosing circles in the interspaces: the whole of the lines being marked out by a broad and bold guilloche ornament following all the intricacies of the geometrical forms. This is one of the finest examples there could be of the effect of simple geometrical design and detail, without any suggestion from natural forms.

But in the use of design derived from nature, the Roman mosaicist, sometimes quaint, is sometimes also exceedingly grand and bold in his treatment. This is especially the case in some of the specimens from Carthage at the British Museum. Two of these may be especially noticed; one, apparently, an angle of a large floor, with a head in the corner which has been supposed to represent Spring. From this stretches diagonally into the floor space a symmetrical pile of leafage in warm tones, and on either side of it the space is filled up by grand scrolls of conventional foliage in the freest and finest style. Another from Carthage, almost equally fine in its way, shows how much individual variety of taste existed when these were made, for this latter one, in the next compartment of the "cellar," is in a totally different style; it is a central portion of a large pavement, without the border, and contains heads arranged in squares and circles at equal distances from one another, and the spaces between filled in with beautifully delicate spray and leafage in quite a different style from the foliage in the last-named example,—much more realistic and lighter and thinner in effect, but still quite suitable to its position. The effect of the whole over a large extent of flooring must have been beautiful, if we get over the unsuitability of having designs for heads in that position, where they must be seen upside down from one side of the apartment. The same kind of defect,—the design for a floor of what ought properly to be a vertical design,—characterises also what is, nevertheless, a very remarkable and interesting mosaic, drawn in Wollaston's collection, and of which a large fragment is in the British Museum; this is also a Carthage specimen, and represents rows of vases with intersecting arches rising out of them, on which birds are occasionally perched, and in one place a meandering bit of blue is introduced to represent a river, and two stags drink from it, while beside them is worked into the mosaic, with curious *naïveté*, the word "Fontes." Nothing else in the design is explained, and it is difficult to understand the whim which induced the designer to give this one stray marginal note in the middle of the work. Among the Wollaston drawings a few more may be drawn attention to as especially fine and interesting designs. One from Roxby, Lincolnshire, introducing Greek border patterns a good deal, is remarkable at the same time for the very Saracenic characters of the diapers. A specimen from Hadrian's Villa is interesting as showing in the angles that use of vases with conventional foliage growing out of them which became such a pet feature of Renaissance ornament. An example from Cotterstock, a panel with a vase in the middle of it, is, however, remarkable for a treatment quite different from what the Renaissance ornamentists took up; for here we have not a realistic representation, but a highly conventionalised indication of a vase, so cleverly done and in a style so suitable to the material, that it becomes quite an interesting bit of ornament. Another from Cotterstock shows a very fine and elaborate treatment of the Greek fret pattern, often, as we observed, poorly treated by Roman designers. A drawing of a pavement from Vienne, in France, in squares divided off by borders with double rows of lozenges, and filled in with geometric designs, is remarkable for its very mediæval character; in this respect it may be compared with one in the British Museum cellar, described by the Museum authorities as of "pomegranates, flowers, and leaves, arranged in cruciform patterns" (one of the Carthage mosaics), and which is singularly like mediæval ornament in general character and construction. Among the finest in the Wollaston set are two, copied from specimens in the Vatican Museum. One of these is a floor diaper in black and white, of wonderful elaboration, and certainly one of the finest and richest diaper designs ever seen; in the centre, a panel contains a fine silhouette figure of an eagle and hare, a subject found rather frequently in Roman ornament. Another magnificent design from the Vatican collection is a circular centre panel with a half-figure of Minerva, with angle spandrels filled in with silhouette figures and foliage in black on white ground.

Among the mosaics which are more or less pictorial, or which deal with human and animal figures, there is a great variety of merit. Mosaic pictures, in the strict sense of the term,—pictures with backgrounds and landscapes and perspectives,—are rare; the rarity being, we may be allowed to think, not so much owing to any instinctive æsthetic perception in the Roman mind of the unsuitability of such subjects for mosaic, as to the practical difficulty of carrying them out at all in the material. The South Kensington Museum possesses one specimen (also figured in the Wollaston drawings) of a farm-yard scene, and a man milking a goat in the middle of the picture, which is excellent in execution, and is probably as well done as anything of this kind could be done in mosaic, but the result only shows that it was a mistake to attempt it. Among the animal life shown in Roman mosaics it is noticeable that by far the best things are the birds and fishes. The Wollaston drawings include one from Sta. Maria in Trastevere, representing fowls stealing snails out of amphoræ, which is remarkably realistic and true; and the South Kensington Museum contains an original specimen showing cuttle-fish and a lobster with great success. There are some finer examples of the same kind in the British Museum, however, one especially from Carthage showing fruit and fish and baskets. It is remarkable that the representations of quadrupeds are universally bad in drawing, although almost invariably spirited in action. Considering how the Romans could carve quadrupeds in sculpture, it is curious to find such a great inferiority in power in mosaic, and leads to the conclusion that an inferior class of artists were employed in the latter, in many cases at least. The best quadruped figure we have met with is a horse drinking, in a specimen in the Wollaston drawings, from near Barcelona; a charioteer driving in a circus (from Lyons), among the drawings, shows great spirit in action, but the horses' legs are mere spindles. In the British Museum specimens the best are one or two figures of lions, in which there is a great deal of go and and a little more appearance of anatomical truth than in the horses. Among human figures there is the greatest possible difference in execution, depending, perhaps, partly upon date; but the dates of these works are in very few cases known, so it is matter for conjecture. There is a figure of Europa on the Bull in the British Museum, in which it is difficult to say whether the curious proportions of the lower limbs are due to ignorance of the figure or to an attempt (quite unsuccessful, in that case) to represent the sitting posture by foreshortening the upper part of the limbs. Some of the figures shown in the Wollaston drawings are, at least, however, much better than this one; and fine heads are frequently to be met with. Among these the colossal head of a marine deity, in the British Museum, the upper portion of which is unfortunately missing, is a grand specimen; in its bold conception, with the broad masses of seaweed clinging to the beard, it is a fine example of that power and largeness of style which characterise the genius of Roman art, even when we cannot but feel that refinement and true taste are wanting. It is to be hoped that this remarkably interesting collection of Romar remains, at present in the ill-lighted cellar of the British Museum, will, now that the new abode for the Natural History collection is ready, soon be brought up to the light of day, along with many other things of great interest, now almost out of sight and knowledge. A study of the mosaic specimens there, coupled with the Wollaston collection of drawings at South Kensington, will even now, however, enable any one who wishes it to form a very good idea of the variety of character, the quality of design, and the effect in execution of Roman work in this fine and enduring form of decorative art. This quality of endurance is well shown in the British Museum specimens. Mosaic may, unfortunately, be rather easily broken up, and when once a building is abandoned or neglected, the floors are likely to be disturbed sooner even than the walls. But of the portions that have been preserved whole, many are as fresh as ever, and might be laid down as parts of a new floor to-morrow.

THE HISTORY OF OLD ST. PAUL'S.

Two works, of considerable value for the light they shed around the history of Old St. Paul's, have just been written by Mr. W. Sparrow Simpson, D.D., F.S.A., Minor Canon, Librarian, Succentor, and Junior Cardinal in the Cathedral, and Honorary Librarian of the Archbishop of Canterbury. The first of them is entitled, "Chapters in the History of Old St. Paul's," published by E. Stock, Paternoster-row, in an elegant old-style octavo, of 300 pages; the other a monograph entitled "Some Early Drawings of Old St. Paul's," forming a paper in the current number of the Journal of the British Archæological Association. Taken together, these two literary productions comprise a large amount of research which has rewarded the author with a store of new facts concerning the imperfectly-known character of the old cathedral church, its fabric, and its historical surroundings.

The early history of religion in London is shrouded, just as of that in other places, in a mystery which may never now be unfolded. The recorded mission of Fagnus and Dumanus by Pope Eleutherius to King Lucius, of Britain, has, nevertheless, withdrawn into the dim region of Christian mythology, and almost the only relic which still survives to cast any light for us upon the religion of the pagan inhabitants of ancient London is the little altar of Diana, which was found on the site of Goldsmiths' Hall, where it is still preserved as the choicest ornament of the court-room of that wealthy guild. But if the conversion of King Lucius be nothing but a myth, there can be no doubt that Britain, half civilised, and a conquest to the Roman arms, gradually fell a conquest, in like manner, to the faith of Christ during the second and third centuries. The names, indeed, of some who who were bishops in England in the fourth and fifth centuries have been handed down, but criticism has not altogether accepted their claims. Much has been written concerning the pre-Augustine Church in Britain, but, after all, illogical conjectures and imperfect inferences form the bulk of such writings, and it is not until the closing years of the sixth century that we get a definite date from which to take our stand, and to calculate the accurate history and fasti of the English Church. Thus the year of our Lord 597, the date of the advent of Augustine, is followed by the building of the first church of St. Paul by King Ethelbert, and the consecration of Mellitus to be its bishop at the hands of Augustine himself. Where Mellitus established his cathedral, doubtless there now stands the majestic cathedral of the metropolis, but in those far-off days a prætorian camp of the Romans (perhaps itself occupying a site previously fortified as an earthwork by the earliest inhabitants of England), or a heathen sanctuary, surrounded by trees and shady woods, may have stood upon the Pauline hill. No records, however, remain to enlighten us upon these points.

Probably a simple structure of unhewn

stones, like some of the earliest forms of edifices which still exist in Ireland, or a building of rough trunks, shaped by the axe, like that strange method of construction of which an example still remains at Greenstead, near Epping, and for which the suburban woods and forest would have supplied abundant materials, was the only edifice in which Mellitus and his little band of ecclesiastics chanted their services "where" now,—

"Through the long-drawn aisle and fretted vault,
The pealing anthem swells the note of praise."

Of Ethelbert's cathedral nothing whatever remains apparently, and nothing is known of it critically; future explorations may perhaps some day reveal a few relics of foundations which can be attributed to this age, but in the very nature of it any extensive excavation with a view to determine its site would be impossible. Fire, always the bitter enemy of St. Paul's, consumed the cathedral buildings in A.D. 961. But the edifice was restored in the same year. Again, on the 7th of July, A.D. 1087, a little manuscript in the British Museum, the "Chroniculi S. Pauli," records that "the church of St. Paul in London, and all things that were therein, together with great part of the city, were burnt with fire in the time of Maurice, Bishop of London." This second church was, in like manner, rapidly reconstructed. Again, in A.D. 1137, the cathedral fell a prey to the flames, according to the same manuscript, which relates that the fire on this occasion commenced at London Bridge, and extended as far as the church outside the bars of the New Temple of London. Nothing is known very accurately of the extent of the conflagration of 1137. Dugdale, following the generally trustworthy Matthew Paris, as quoted in Longman's "Three Cathedrals dedicated to St. Paul," places the date of this fire in A.D. 1136; Matthew of Westminster, another fair writer, places it a year earlier; and, as we have seen, the "Chroniculi" make the date a year later.

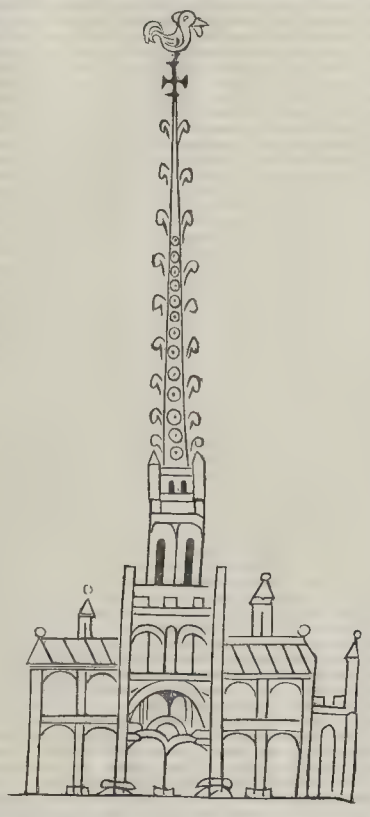
But the citizens of London loved their church too fondly to allow it to lie long in ruins. The work of rebuilding progressed under the fostering care of successive prelates and pious benefactors, and in due time the third church, that stately structure which is so familiar to us by means of Hollar's admirable etchings, arose, like a phœnix, upon the ashes of the second edifice, which had stood hardly half a century intact. When this was completed, there stood the cathedral church in its walled enclosure; to the north-west the bishop's palace; on the south-west the deanery; the greater cloister and the college-house of the minor canons on the north; on the south the lesser cloister, the chapter-house, the bakehouse, and the brewhouse. It was, without doubt, a grand sanctuary, full of all the details which went to compose a cathedral of those days, rich with many altars, shrines, images, and reliques; manuscripts of Holy Writ and ancient rituals; tombs of kings and saints; and well-worn places of famous pilgrimages. The lofty wall-mass of the lengthy nave with its twelve bays, of the choir with its equally numerous arches, and of the well-developed transepts, crowned by the delicate and lofty spire, higher than that of Salisbury, must have presented to the view a singularly impressive *coup-d'œil*. "Crowning," as Dr. Simpson writes, "the summit of the highest hill in the city of London, surrounded by the low houses of the dignified clergy and others, who dwelt under the shadow of the church, with broad gardens sweeping down the hill towards the river, the view could not fail to impress the spectator. There is, in fact, good evidence that its beauty was appreciated, and that those who gazed upon the magnificent building desired to record their impression of its grandeur."

A few drawings of this cathedral church remain in ancient manuscripts. The first we shall mention is a chronicle of the fourteenth century among the treasures of the Archbishop's library, at Lambeth Palace, where a marginal view of the cathedral, drawn with considerable attention to detail, is given in illustration of an account written by the chronicler respecting the taking down, in A.D. 1314, of the cross and ball, with great part of the campanile, because they were decayed and dangerous, and the erection of a new cross and ball, well gilt, and fortified with a collection of divers relics of saints, for the protection of the building. This was done on the 4th of the nones of October. The height of the whole is stated in this manuscript not to exceed 500 *ft.* The marginal sketch shows the great west doorway, the transepts very much compressed, an arcade of five arches running throughout the width of the building, the central tower, with four (here shown in elevation as two) pinnacles at the angles, and the lofty spire, with a large oblate, egg-shaped ball of large proportions, surmounted by a cross. The relics which were replaced in the gilded ball comprised a considerable variety of things, from a piece of the wood of the True Cross, to sundry bones of the 11,000 virgins of Cologne. They were exhibited to the congregation during a Sunday sermon, and afterwards carefully replaced in the ball, not without some sarcasm and scorn on the part of unbelievers, and were the subject of a special service of hallowing on the 6th of May, A.D. 1438, nearly 200 years afterwards. Architecturally, the spire, as drawn in the chronicle, is very curious. There is little doubt that the man who drew it intended to delineate, to the best of his ability, the main features of the actual building as a simple elevation. The exceeding height of the spire and the capacity of the ball greatly impressed the limner, who has depicted his impression of it in a very graphic manner.

Another illustration of St. Paul's Cathedral found by Dr. Simpson in the course of his investigations, and reproduced in the Journal of the British Archæological Association, comes from an early fourteenth-century chronicle of Rochester among the Cottonian manuscripts in the British Museum. Here, in the midst of roof-lines and pinnacles intended generally to represent our city (a description of the foundation of London being given in the text), stands the Cathedral church, drawn somewhat conventionally with arcades and gables, having an exceedingly lofty spire adorned with crockets and circular bosses, and surmounted by a cross and weathercock. In later years several notices are extant referring to the setting up of "the newe wethir cokke." From another manuscript of similar date among the royal collection in the British Museum, is derived a drawing of St. Paul's Cathedral in a very different style of treatment. This occurs also (like the last example) as an illustration to the account of the building of London. In the midst of the general view of London stands an elevated view of the cathedral as seen from the north or south, probably the latter, as there are two pinnacled towers, which appear to belong to the west front, to the left of the central tower. This tower also has pinnacles at its angles and



carries a tolerably high spire, and contains two stories of three long windows to each story. We are indebted to the British Archæological Association for the permission to use these illustrations.



Another view, a coloured drawing, probably the earliest picture in existence representing the City of London, is contained in a fine illuminated manuscript also in the invaluable royal collection in the British Museum. The delicacy of the lines, the charming colours, as brilliant as if freshly painted, the harmonious effect, the almost faultless perspective, and the happy manner in which the artist, a man evidently of no mean powers in his own art, has caught the spirit of the scene, combine to render this beautiful picture a perfect gem of the Mediæval Fine Arts, quite apart from the very great architectural and antiquarian value which it manifestly claims. The Tower of London, London Bridge, and many City churches may be easily distinguished in this picture; above all, in the very heart of the city, stands St. Paul's Cathedral with its central spire, and the way in which this catches the light is indicated very cleverly. Another illustration given by the author of these treatises, is a sketch of the temporary coppings placed upon the ruins of the cathedral after the fire which destroyed it on the 4th of June, 1561. This consumed the spire, and seriously injured the adjacent portions of the edifice, threatening at one time to extend beyond the fabric itself to the Bishop's palace.

The chapter devoted to the personal staff of the cathedral is of considerable usefulness to ecclesiologists, who may gain much information concerning the various dignitaries of the foundation, and their offices. Curiously enough, among the minor canons, twelve in number, were two cardinals, *Cardinales Chori*, an office not found in any other church in England. The duties belonging to their position are not very clearly defined. The chantry priests, a large body, were appointed not only to officiate at the special altars to which they were attached, but they had duties of attendance in choir. Chaucer alludes to the eagerness with which some of the county clergy, to the neglect of their own parishes, fought for chantries in St. Paul's. The ritual and religious services of the cathedral; the care, labour, and forethought required to feed the multitude who derived their sustenance from the cathedral revenues; and many of the aspects which present themselves to thoughtful men like Dr. Simpson, have been treated with care. Occasionally irregular forms of devotion sprang up in the cathedral for a time, like the strange popular devotion to Thomas of Lancaster, in whose honour a short "office," probably intended to be said at his tomb, and a more elaborate "office," with special anthems and hymns, were composed. The British Museum contains a metal plate used in the thirteenth century by the barber who shaved the crowns of the officers of St. Paul's, in order that all who took their tonsures from him might be of uniform cut. The rites of the boy-bishop, with the other usual and unusual

services, supply frequent themes for the pen of a careful writer; and in the chapters devoted to walks around St. Paul's, Dr. Simpson shows considerable knowledge of the topography of the cathedral precincts, and the numerous details which made up the cultus of St. Paul's Cathedral life in the Middle Ages. Notices of Wyclif and the stirring times in which he moved, his appearance before his judges in St. Paul's, in 1377, with the sequel of the tragedy in which the great Reformer played so prominent a part; the Lollards' Tower; the stocks in the dungeon of St. Paul's; the horrid tortures inflicted upon ecclesiastical and judicial prisoners by overbearing prelates and their bloodthirsty assistants; the miserable end of the desperate Peter Burchet, a murderer and apostate, in 1573, the last prisoner in the Lollards' Tower; these and many more episodes which combine to make up the individual and hitherto uncollected history of our metropolitan cathedral and its associations, must be sought for in the interesting volume we have before us.

Of the great fire of 1561, and the disastrous effects which it produced upon the sacred edifice, much has been recorded. Among the many conflagrations which have made havoc with the cathedral, this holds a prominent place. A rare tract, entitled "The True Report of the Burnyng of the Steple and Churche of Poules in London," which is preserved in the Library of the British Museum, and printed by Dr. Simpson, records the most circumstantial details of this calamity. John Stow, also, whose remains have furnished ample store of notes to all who patiently examine them, affords here much new information as to the result of the fire, "whiche was a lamentable syghte and pytyfull remembrance to all people that have ye feare of God before theyr eyes, consyderynge it was ye hous of owre Lord, erectyd to prays hym and pray to hym, ye beawty of ye syte of London, ye beawty of ye holle Reallme. A mynster of suche worthy, stronge, and costly buldynge, so large, so pleasant and delectable, not only of mynstyrs within this realme, but ells where as sure as travayll hathe taughte ws in other realmes ethar Cristyn or hethyn." Paul's Cross and the doings of those who were its denizens furnish other store upon which a most readable chapter is founded, and the book concludes with a sketch of the fortunes of the cathedral during the *interregnum* and its troublous times, when the lopping of the revenues was planned and executed, when the Parliament treated the bishops and their clergy with high-handed dealings, drove out the prebendaries, and replaced them with trimmers and place-hunters, dispersed the plate, stopped the necessary repairs, suspended the works, and allowed desolation and desecration to work their natural way with all that had been rich and beautiful and sacred hitherto. Eloquent words, which will bear quotation, ring upon our ears as we close Dr. Simpson's book. They will bear quotation here:—"Many another grand cathedral had the same sad tale to tell; the same wearisome story of pluralities and non-residence, of overwhelming greediness and self-seeking, of rampant nepotism, of desecrated naves, and of deserted choirs; of dignitaries receiving great revenues and rendering no service in return,—of cold hearts. The way was paved for still greater desecrations, and they came. Horses neighed in the canons' stalls; and Dr. Cornelius Burges, with his twenty thousand pounds of plunder, preached in the ruined choir. We may not conclude with words of sadness. Nor is there need. The renewed life of the cathedrals is one of the most striking features of the great religious revival of our day. St. Paul's has abundantly shared in that regeneration, and let the reverent thousands gathered in its vast area, its long-drawn nave, its spacious transepts, filling every part, silent, listening eagerly, last dedication festival to the grand music of Mendelssohn's 'St. Paul,' remind us that the cathedral is something more than 'a petrifaction of religion.'" Works like these, which we have brought before our readers on this occasion, are not without their use in fostering the reverential feelings we should all exhibit towards so historic a pile as the cathedral of St. Paul.

The Plane Tree at South Kensington Museum.—Mr. Smiles pleads for the preservation of "the magnificent plane-tree in front of the old entrance-door of the South Kensington Museum," which, he says, is about to be sacrificed to make room for certain new buildings.

THE NEW FRENCH SYSTEM FOR THE CONSTRUCTION OF HOSPITALS.

THE effort to substitute small isolated structures as hospitals for the monumental buildings of the past, has at last received in France practical sanction as well as theoretical support. In spite of the antagonism of private interests and the force of routine, the new system has been adopted for military and civil purposes at St. Denis, at Courbevoie, by the Paris Municipal Council, by the Eighth Army Corps at Bourges, at Autun, at Cosne, Macon, Montpellier, &c. The idea of isolated small structures of only one story instead of large hospitals was first advocated in France by M. Le Roy, in a paper submitted to the Royal Academy of Sciences in 1777. The first application on a large scale of this principle was during the Crimean War, when in some instances the patients were separated as much as possible. The experiences during the war of Secession and during the Franco-Prussian War clearly demonstrated the advantage of tent and cottage hospitals. The deaths after surgical operations in these hospitals during the American War amounted to 34 per cent., while during the Crimean War in the old-fashioned hospitals the French lost 74·8 per cent. of the soldiers who had undergone surgical operations.

The method of construction which is now generally adopted in France, wherever the new principle is admitted, is known as the système Tollet, and was patented by M. Tollet, a distinguished engineer, Knight of the Legion of Honour, &c. This gentlemen has sought to build in harmony with the laws of hygiene rather than merely in keeping with some special school of design; he has realised that the object of a hospital is not to ornament a town, but to cure its inhabitants; that its sanitary qualities are far more important than its monumental appearance. We need not trace the well-known arguments which would lead a person actuated by these principles to propose small cottages or pavilions standing well apart and surrounded by free currents of air, for the re-introduction of which the *Builder*, in the first instance, did so much; but it is essential to inquire in what the Tollet system differs from the English cottage hospitals or the wooden huts of the American Civil War.

The first important difference is in the form adopted. The great object was to expose as large a surface as possible of the hospital to the purifying influence of the external air, and as little as possible to the contaminating influence of the internal air. For this purpose cross-beams, angles, ceilings, and numerous floors, garrets, and staircases should be avoided where practicable. A vaulted roof would not present the same multiplicity of angles as a flat roof or ceiling, where the corners cannot be readily reached by the currents of air and by the scrubbing-brush. But the choice of the right curve was a puzzling problem. The full-centre arch, the circular arch, the ellipse, the depressed arch, would all give a curve that is too flat in the upper part and too vertical in the inferior half. This would make the introduction of a "matlass" of air of even thickness a matter of some difficulty, and also the traction would necessitate the placing of rafters across the vaulted roof to prevent the spread. But rafters would not only increase the cost of the structure, but also the amount of material employed and capable of absorbing injurious emanations and of harbouring dust and dirt, while reducing by their presence the space for air in the wards. All these objections led to the ultimate adoption of the ogival or pointed arch. The frame-work of the hospital is made of iron girders or ribs, placed at a distance of 4 ft. from each other, meeting at the point of the arch. The peculiar shape of the girder gives the iron double the resisting power it would otherwise possess; and, this being the case, it does not matter of what substance the wall is made, so far as its durability, or rather its strength, is concerned. For field ambulances the intervening space is filled up with wooden planks, which can be burnt each time there is a change of quarters, thus reducing the chances of infection and the weight of the materials to follow in the wake of the army, both these advantages being of the greatest importance.

Where the hospital is to be of a more permanent character, bricks or stones are used. The most important hospital of this description is that of Bourges, which holds 220 beds. It is situated on a gentle slope, and covers six hectares and fifty ares of ground (about fifteen acres). This is equivalent to 2,582 square feet of land per bed, whereas the new Hôtel Dieu of Paris will only give 386 square feet of land per bed if it is to hold 600 beds, and 290 square ft. if the full complement is to be 800 beds. The Bourges Hospital consists of twelve one-floor ogival pavilions erected at a distance of 52 ft. from each other, the principle being that the intervening space of open air or garden should be twice as wide as the structures are high. These pavilions are divided into two rows, and the garden separating the one row from the other is about 164 ft. wide, while the amphitheatre, dead-house, &c., are erected at a still greater distance. The pavilions measure 120 ft. in length by 26 ft. in width, and are raised about 5 ft. above the earth. They contain twenty-eight beds, nearly 4 ft. being allowed between each bed, and more than 9 ft. between the two rows of beds. Altogether each individual has 57 cubic mètres of space, though in the American hospitals the space allowed barely exceeded 40 cubic mètres, and 27 cubic mètres were considered the minimum.

The outer surface of the wall of this structure is allowed to retain its porous character, as pure air only plays upon it. Between the vaulted roof and the outside covering of tiles there is a "matlass" of air 8 in. wide, and the bricks employed for the wall are perforated, so that a current of air passing within the wall excludes the damp and modifies the excess of cold or of heat. The inner surface of the wall is covered with silicate, so that it is rendered smooth and non-porous; it can, therefore, be washed with an antiseptic solution, or, better still, it may be daubed over with petroleum and scorched by its flame. The building is made exclusively of non-combustible materials, and vapours condense on the walls, run down the side, but do not sink into the pores, where the organic matter is prone to ferment. The floor at Bourges is made according to the Gourguechon patent, of wood thoroughly covered with a bituminous substance, so that the hospital dust cannot sink in,—an important consideration when we remember that this dust has sometimes been found on analysis to contain 34 per cent. of organic matter.

One of the leading advantages of the ogival form is the facility it affords for the complete ventilation of the hospital. In winter the warmed air naturally rises to the point of the arched roof, where there is a ridge that can be opened running along the entire length of the pavilion, and communicating with cowls placed at short distances one from the other, which draw off the air when the ridges are closed. There are numerous large windows on both sides of the pavilion, and above them small louvre windows, that can be readily opened by a rope. The doors at each end of the pavilion are surmounted by a rosace, that helps to ventilate in a longitudinal direction whenever the course pursued by the wind renders lateral ventilation not so advantageous. The ridge at the point of the arch is 4 in. broad, runs the whole length of the building, and is divided into sections of about 15 ft. each. One or all of these sections can be opened by means of ropes, thus allowing an outlet for the vitiated air at the apex of the arch, where it would naturally ascend. The air is admitted by small apertures pierced both below the beds and at some elevation above them, and is drawn in by the heat of the stove in winter. A space of 5 ft. underneath the floor of the pavilion also admits of all manner of experiments in respect of ventilation, as here the air can be collected, cooled or warmed, moisture added, or it can be charged with medicated vapours.

At the end of the pavilion, facing the entrance, there is a door that communicates with a little annexe, which is severed from the main building by a covered passage, open on both sides, and about 9 ft. long. Here are the closets, communicating with a tub placed in the open air immediately below. The sides of the tub are provided with a spongy substance, soaked with a disinfectant, so that the matter received is at once purified. Near to the tub, and also in the open air, under this annexe, is a little cart, which receives from above the soiled linen, so that it is at once removed from within the walls of the hospital. The main building, or pavilion, apart from the dormitory with its twenty-eight beds, contains on each side, on entering, a small separate room, the one for the nurse, the second for any patient it might be desirable to keep isolated. At the other end of the ward there is a small dining or sitting-room, a bath-room, and a small kitchen for making poultices, &c. Such is the Tollet Hospital at Bourges. Each of the

pavilions is like its neighbour, excepting the pavilion not built for the patients, but for the administration offices, pharmacy, kitchen, &c. With some slight modifications the same system has been adopted throughout. There now remains to be seen what sanitary and financial advantages have been achieved.

It is easy to perceive that the main features of the Tollet system are susceptible of a very wide application. There is even a Swedish church built in Paris according to these principles, and its application for stables naturally suggests itself. There are Tollet stables for the French cavalry, but the new method of construction has been most extensively applied in the building of barracks. The sanitary results realised by the Tollet barracks will explain their great popularity. At Bourges there are barracks on the Tollet system for 1,471 men of the 37th regiment of artillery, where the mortality amounted to 7·6 per 1,000 in 1876, instead of 11·88 per 1,000, the average mortality of this branch of the service during the year in question. In 1877 the deaths were 5·43 for the Tollet barracks, and 10·50 for the other artillery barracks. At Bourges in 1876, there were 468 cases of illness per 1,000 artillerymen, and in 1877 only 428, whereas the proportions per 1,000 for the two years in the other barracks were 552 and 506 per 1,000. At Autun, there are infantry barracks on the Tollet system for 844 men, and at Cosne for 745 infantry. In 1876, the average illness of the French infantry amounted to 528 cases per 1,000 soldiers, but this was reduced at Autun to 136 cases, and at Cosne to the singularly small number of 22 cases per 1,000. During the following year the average sickness of the infantry amounted to 482 cases per 1,000, but at Autun there were only 111 cases per 1,000, and at Cosne 71 per 1,000, and no deaths at either place. Of course it is unfortunate that as yet we have only statistics for two years, still they are sufficiently emphatic to leave but little room for doubt as to the good achieved; nor had any case of typhoid fever occurred in any of the Tollet barracks, though this disease has been very prevalent among the French troops; indeed, the 95th regiment of the line was recently quartered at Bourges, one battalion in the old-fashioned barracks of St. Sulpice, another in the barracks du Grand Séminaire, and the two remaining battalions in the new pavilion or Tollet barracks of Séraucourt. In a short time typhoid fever broke out in both the old barracks; there were thirty cases, and no fewer than eighteen deaths. The twenty pavilions of the Tollet system were within a hundred paces of one of the old barracks, and the soldiers who inhabited them were of the same regiment, and yet not a single case of typhoid occurred among these men!

With respect to diseases of the respiratory organs, the statistics are equally satisfactory. During the two years 1876-77, the number of cases were only equal to 20 per 1,000 at Bourges, Cosne, and Autun, whereas at Dijon and Nevers, where the climatic influences are the same, the proportion was 40 in the 1,000. The diseases of the respiratory organs are most frequent among the regiments quartered in the high lands of the Rhone, the Alps, the Dauphiné, and Savoy. In these districts the statistics show 54 cases per 1,000. With the 13th Army Corps in Auvergne, the figures are also 54 per 1,000; with the 11th Corps in Brittany, 50 per 1,000; with the 12th Corps in Limousin, 50 per 1,000. The minimum is with the 17th Corps, namely, 31 per 1,000, and the 8th Corps, occupying the Bourges district, 32 per 1,000; while in the Tollet barracks the proportion is, we repeat, 20 per 1,000. These few figures will suffice to show what important results have been attained, though much more might be said on the subject.

While the reform in the construction of hospitals and barracks has thus ensured a great saving in the life and health of the French soldier, it has been equally beneficent to the pocket of the French taxpayer. The hospital at Bourges was designed for 320 patients, and would have cost 112*l.* per bed. But when the works had begun, the scheme was altered, and the number of beds reduced to 220; this caused a considerable increase in the proportionate expense, and the hospital actually cost 144*l.* per bed. The cheapest French hospital is estimated at 180*l.* per bed, with 40 instead of 57 cubic mètres of space for each patient; but the cost per bed amounted at Lariboisière to 720*l.*, at Ménilmontant to 640*l.*, and at the Hôtel Dieu to the fabulous price of 2,400*l.*! In the construction of barracks, according to the new system, we are promised an economy of, at least, about 30 per cent.

Under these circumstances it is not surprising that the proposed reforms should have found many warm advocates, and achieved some notable theoretical as well as practical successes. The most recent achievement has been the conversion of the Paris Municipal Council. The necessity of increased hospital accommodation in Paris has long been felt, and the Municipal Council have finally voted a sum of 17,600*l.* for the construction of a hospital according to the Tollet method at St. Ouen. The municipalities of Courbevoie and St. Denis, near Paris, are now constructing hospitals according to the same system. Havre has a similar project in consideration. At Montpellier it was decided to abandon the old central hospital where the *clinique* of the university was held, and to build a Tollet hospital in the outskirts of the town. The same system has been adopted for the engineer barracks at the fort of Cormeilles, for the cavalry and infantry at Macon, for the artillery at the fort of Langres, &c.

Abroad the Tollet system has been adopted for the Austrian army, and almost every European power has sent special commissioners to visit Bourges and report on the innovation. In this respect, the Danes and the Russians have been particularly active. The Grand Duke Constantine, in person, conducted the inquiry, and has had many lengthy interviews with M. Tollet. The time has, therefore, come when English sanitary reformers should take further note of what is occurring among our neighbours in this very intricate and important question.*

ABSTRACT OF THE CENSUS LAID BEFORE PARLIAMENT.

THE preliminary Abstract of the Census, of which we gave our readers some forecast in a recent number, has been laid before Parliament. In our notices of any statistical papers which so directly affect the prospect of the trades connected with building, it is our object to present our readers with such deductions as we may ourselves work out, as likely to be of value from the *Builder's* point of view, rather than to repeat those details which are to be found in the daily papers. The form in which a statistical paper is presented to Parliament naturally determines, for the most part, the tone and bearing of the remarks which it elicits from the press. When the report is crude and raw, remarks are vague and general. In the present case the Registrar-General has himself provided an analysis of his report, giving ratios and percentages, and enriching, or at least augmenting, the English language by a new word to express the relation of area to population. At all events, we do not find the word "areality" in the English dictionary.

The sum total of the great addition may be conveniently regarded under the following heads:—

	1881.	Per cent.	1871.
England and Wales.....	25,968,286 ...	73·78 ...	22,702,268
Scotland.....	3,734,370 ...	10·60 ...	3,360,378
Ireland	5,159,839 ...	14·69*...	5,412,377
Islands.....	141,223 ...	·50 ...	—
Army and Navy abroad	242,844 ...	·70 ...	—
Total	35,246,562 ...		... 31,845,379

* Decrease.

As to the distribution of this large number of human beings, with regard to the area of land in the several main divisions above indicated, it may be convenient, first, to state the acreage. This we have given at

	Acres.
England.....	32,590,397
Wales.....	4,734,436
Scotland.....	19,639,377
Ireland	20,322,641
United Kingdom.....	77,286,991

The proportion between population and area is calculated in two ways. The simplest of these, as dealing with the roundest numbers, is stated in units of population per square mile of country. The other method, which the Registrar-General describes by the word "areality," is stated in yards, or acres and fractions of an acre, per unit. The density of the population of England and Wales is now about 440 persons to the square mile, or ·625 to the statute acre. At the census of 1871 the density was, according to the Registrar-General, 390 persons per square mile (our own figures give 384); the increase on the decade being at the rate of 50 persons per square mile, or 12·83 per cent. The "areality," also given by the Registrar-General, was 19,934 square yards to each person in 1801; 7,928 square yards to each person in 1871, and 6,955 square yards, or 1·437 acres, to each person in 1881. With this increase of density (not for the United Kingdom, of which we spoke on a previous occasion, but) for England and Wales, has to be contrasted the decrease of density in Ireland, from 258 souls per square mile in 1841, and from 174 souls per mile in 1871, to 162 souls per square mile in 1881.

With regard to the primary division of the population, namely, that according to sex, if we confine ourselves to proportions per cent., they will be found to be 51 per cent. of females, to 49 per cent. of males, the proportion being the same for the United Kingdom, and for England and Wales. This shows an increase in the proportionate number of females since the beginning of the century, when the ratio was 50·6 females to 49·4 males. The difference is not very large; but it is deserving of remark as connected with the recent movement made as to female education and employment. Moreover, in dealing with such large numbers, the transfer of even four *per mille* from one side of the account to the other shows an additional preponderance of females over males, as compared to the ratio existing in 1801, of more than 280,000 souls.

The Registrar-General has given the percentage increases during the century, in the same manner as that in which, in a previous article, we ourselves had calculated them for London alone. They are as follow:—

	Per cent.
1801 to 1811	13·99
1811 to 1821	14·83
1821 to 1831	14·67
1831 to 1841	10·09
1841 to 1851	2·54
1851 to 1861	5·72
1861 to 1871	8·62
1871 to 1881	10·68

Thus as far as the ratio of increase on the population can be taken as a test of prosperity, the country is now in the same condition as in the decade 1831 to 1841. It should be remarked, however, that it was in this decade that the railway system was introduced. The effects could hardly be distinctly perceived by 1841; but by 1845 the great prosperity of the earliest lines had produced the well-remembered railway mania. In spite of the stimulus thus given to the productive force of the country, we find, however, that this very decade was marked by the lowest rate of increase during the century. This fact has to be looked in the face. It is not alone among these data which serve to show that marriages, or, at all events, prolific unions, do not increase with the increase of the material prosperity of a country. We are not offering any opinion on that vexed question. But we call serious attention to the comparision above indicated. It is a remarkable coincidence that on the very day on which the above lines were written, a telegram from Berlin in a morning paper says,—"The authorities, who have been considering the cause of the decline of commerce and industry, are inclined to attribute it to over-population, which is becoming manifest at an alarming rate, and is entirely out of proportion to the augmentation of agricultural products." The subject is one of the highest social interest, and is one on which hasty generalisation, from insufficient data, is mischievous. When we contrast the two most densely-populated English counties, viz., extra-metropolitan Middlesex, with 1,364 souls to the square mile, and Lancashire, with 1,707 souls per square mile, hives of industry and cradles of wealth, with the 162 souls per square mile of Ireland,—the word over-population has a curious inconsistency. Important as the proportion between the agricultural produce of a district and the population which inhabits it must be, it is evident that it cannot be regarded alone as a measure of the proper distribution of population. As to that, indeed, the controlling feature must be the military or naval *status* of the district in question, or the ability of the people in time of war to command the uninterrupted access of such supplies of food as they desire from abroad. Bristling as the world is with arms, while the dull sound of cannon is now echoing from the shores of the Mediterranean, there is only too much reason for reflecting with anxiety on the foregoing consideration. A dense and a rapidly-increasing popula-

* In connexion with this subject reference may be made to our illustrated account of the Sturges Pavilion, Belle Vue Hospital, New York,—vol. xl., p. 68, &c.

tion is a feature of which the value depends upon the co-efficient,—to borrow a metaphor from algebra. With wisely-directed industry, every fresh arm added to the army of labour is a source of natural wealth. In the absence of wisely-directed industry we have to regard, not so much the increased number of arms, as the increased number of mouths. When a man cannot do something more than feed two and a half human beings by his labour, human beings are, economically regarded, but noxious weeds. When he can and does endeavour to feed four, six, ten, or more of his fellows, every man is like a ripe ear of corn added to a well-filled sheaf.

SANITARY AND SOCIAL ASPECT AND PROSPECT IN DUBLIN.

IN continuation of our notes on some of the sanitary, social, and other aspects of Dublin, let us observe here that our views are not the result of impressions from hurried visits through the city and environs, but of repeated inspection and inquiry in each locality. Progress or decay in the life of a city, to estimate it aright, needs a retrospective as well as a present survey. It needs also that the investigator should have some previous personal knowledge of the places and habits he describes extending over a number of years, so that he may draw just comparisons. Antecedent labour in the above direction, we believe, entitles us to speak: so we will proceed with our notes. In almost every quarter of the city proper, large areas are met with characterised by visible evidences of decay,—dilapidation in respect of buildings, uncleansed and badly-cared for streets, indigence among the industrial classes through scant employment, and a desperate struggle for life among large numbers of the small shopkeeping class. This decay is creeping on like a cancer, and it is now skirting and hedging in the very Viceregal and municipal centres of the city, affording a sad contrast with the pictures presented by those parts of the city fifty years ago, or even less. Castle-street, adjoining the Castle of Dublin, the Lord Lieutenant's official residence, for two centuries was one of the chief commercial centres of Dublin. Indeed, from the days of Charles II. down to the end of the first half of the present century, Castle-street maintained its importance, and ranked at the head of the old streets of the city on the south side of the Liffey. Since about 1850 this locality has been going down; its wealthy traders deserted it years ago, and most of the houses and shops are in a ruinous condition. If we were to plant the Mansion House of London, the Royal Exchange, and the Bank of England in the middle of the old Seven Dials or Drury-lane quarter, the contrast would be scarcely more marked than that presented by the picture of some of the surroundings of the Castle of Dublin to-day, as compared with its position forty years ago. Dame-street, leading direct from Trinity College to the Castle, still, to a great extent, maintains its importance as a great artery, and has many good buildings; but as it approaches nearer to the City Hall (formerly the Royal Exchange of Dublin) and the Castle, the appearance of several of its old brick buildings spells decay. Parliament-street, too, a comparatively modern street, facing the old Royal Exchange, and leading up Cork-hill to the viceregal centre, is evidencing a marked decay in the appearance of its houses and shops, compared with what was apparent some years ago. We particularly noted the streets named, because for many years those and others leading directly from them have been looked upon as comprising the most wealthy and stirring business portion of the city. Decay at the extremities of a city, like disease at the extremities of the human body, may be arrested by timely remedies; but when disease begins to encroach on a central and vital spot, there is reason to feel alarmed. Municipally, Dublin for many years lacked skilful and intelligent treatment in an improving and sanitary direction. Her black spots were ignored and persistently neglected, till the sores and ulcers of her lower social strata reached her most central and vital parts, spreading by what they fed upon. Thus, in Dublin, tenemental life and living are surging around the most fashionable portions of the city, and threaten to absorb the few remaining haunts of wealth and private and public importance. Reconstruction is a part of the yearly work of every modern city; but in all well-governed cities the work of renewal or improvement need only be carried out by instalments. Unfortunately, in Dublin the measure of her wants is great, for by long-continued neglect wholesale demolitions are at present necessary, and large measures of improvement, building and sanitary, should follow in their wake. That such measures of improvement are requisite for Dublin we believe her own sanitary authorities will not deny; but we are not sanguine that any great scheme of public improvement will be carried out in the Irish capital within a reasonable time. The corporation is constantly pleading a want of funds, and no doubt with a larger income it could do more; but it has not hitherto wisely or economically used the income arising from the city estate nor the loans obtained through its borrowing powers. By the falling in of leases, as well as through other changes, the municipal income is becoming yearly more large, but small measures of improvement are counteracted in their effect in Dublin by the steady growth of large areas of poverty and decay, and the ills incidental thereto. The annexation of the immediate township suburban districts north and particularly south of the city, now ruled by distinct local boards, is now desired by the Corporation. A large number of the inhabitants of the suburban townships derive their income, of course, through city business, shops, offices, and appointments. It is considered that the township residents derive all the advantages belonging to the city, but contribute little or nothing towards its maintenance by contributing to the rates, &c. The municipal body calculate that by the absorption of the townships and the necessary extension of the municipal boundary, it will be then enabled, through its greatly increased income, to carry out those large measures of sanitary and town improvements which Dublin needs and which cannot be attempted under the present financial circumstances of the Corporation. A Boundary Commission sat in Dublin not many weeks since, and after hearing a lot of evidence on the part of the Corporation and the opposing boards, declared in favour of the annexation of the immediate townships. This, of course, strengthens the action of the Corporation, but considerable work need be done yet before the annexation scheme can be carried out. A more widely extended municipal boundary means a larger city, considerably more work, and many new appointments, and their sequence, much greater expenditure. If the Corporation of Dublin succeeds, we hope, for the sake of the public health and the other sanitary and urgent wants of the city, it may prove worthy of its trust, but with the present glaring defects of its constitution and administration before us we, have our misgivings.

That the Corporation are entitled of late to praise for some useful work done in a building and sanitary direction we will not deny; but when all is stated, it is miserably small in view of the wants of the city. Among recent works the rebuilding and widening of Carlisle Bridge is a decided improvement, though long delayed. The new swivel bridge lower down over the Liffey is also a great acquisition, but the Port and Docks Board played the chief part in carrying out these very efficiently-executed works, which it is but justice to say reflect credit on the contractor employed. On the south side the new swivel bridge requires a wide approach to afford better facilities for the vehicular traffic. A new and wide street is contemplated, and is positively needed, and it should be made as a continuation of College-street, crossing the end of Townsend-street, and then curving gradually round to a straight approach to the new bridge. Between the lines of Great Brunswick-street and George's and Sir John Rogerson's Quays, there is a large area of ruinous and unsanitary dwellings, narrow and badly-kept streets and courts, much uncleanliness, and an absence of wholesome ventilation. Opening-up is badly needed in the locality, and this can be accomplished by the demolition of a description of tenemental houses that should have been improved off the face of the earth years ago. This work of improvement might be carried out by instalments, and immediately follow the opening of the approach to the new bridge, which will cut across the end of the neglected locality we have indicated.

One of the most marked improvements effected within recent years in Dublin is the work carried out by the Dublin Port and Docks Board, in deepening the navigable channel of the river and harbour, reconstructing the quay walls in the shipping portion of the Liffey, and extending the line of the North Wall quay a considerable distance seaward. The latter work is still proceeding. More and better dock accommodation is also being provided at the end of the North Wall. Large sailing-vessels and cross channel steamers can now come and go independent of the tides. With the improvements now being effected in the river and harbour, we may soon expect to see the Royal Mail steamers running directly up to the quays of Dublin instead of to Kingstown harbour. The change would expedite the service.

Street and other subsidiary improvements in the city proper move at a painfully and depressingly slow pace. New streets projected by the Old Wide Street Commissioners, before that body was dissolved upwards of forty years ago, are still unopened. The Wide Street Commissioners, during their existence, carried out several notable public improvements in Dublin in an efficient manner, but the "Reformed" Municipal body, which succeeded to the duties of the former body, have not signalised their tenure of office by any street improvements or opening-up within the city worth speaking of. The new street for opening up Cork-hill and Castle-street to Christ Church Cathedral, lately restored, though urgently needed, has been hanging fire these twenty years, to the great scandal of the city. We marvel much the Irish Executive has not taken some steps to expedite the improvement, for, as we have already remarked, the ruin and wretchedness that exist under the very shadow of the Castle are of a very marked character, and present a very uncomfortable background to the viceregal centre. A new street in continuation of York-street to St. Patrick's Cathedral was contemplated sixty years since, but was never carried out. With the improvement of St. Stephen's-green completed a few months since by the liberality of Lord Ardilaun (late Sir Arthur Guinness), the opening of this new street leading direct from the green to the cathedral would be a decided acquisition to the city, and a great benefit to the interests of the cathedral. The opening up of several districts in the old quarters of the south side of the city, and in the north-western old quarters north of the Liffey, is absolutely needed for the health of the inhabitants and as a judicious step in arresting the progress of rapid decay going on in those parts of the town. We regret to note that St. Patrick's Cathedral, which was restored about sixteen years since by the munificence of Lord Ardilaun's father (Sir Benjamin Lee Guinness), is suffering already and in a serious way from damp and rot. The floor of the church is very low, and much under the level of the street without; and, to make matters worse, the bed of the old Poddle River (now and for long years a covered-over and elongated sewer) passes under it in close proximity to the walls of the cathedral. As no special funds exist for providing for the repairs that are now needed, a public appeal has been made.

As regards the drainage and sewerage of Dublin, many defects are still unremedied. The Corporation within recent years constructed by instalments several miles of new sewers, but many more are needed, and long lengths of those recently constructed are very defective in junction and gradient. The old stone house drains in Dublin in general are wretchedly bad; many act and many more do not. Some of these house-drains directly enter the street sewer unprovided with any kind of trap, and in streets where the house-drains are trapped it will be found the traps are very defective, faulty in construction, or out of repair. In fact, in thousands of the houses of Dublin there is a direct communication between the interior of the house and the street sewers, and the gases may be sucked or circulated backward and forward as draught, temperature, or other circumstances accommodate. The latest complement of sewer work carried out by the Corporation a few months ago has been already the subject of two inquiries and reports as to alleged defects and scamped workmanship. Several defects have been proved, others have not been proved. The old system of privies and ashpits or cesspools still obtains in Dublin to a very large extent, and their state in connexion with tenement-houses is truly deplorable and sickening. The old tenement-houses have mostly large and open ashpits communicating with the privies. Being uncovered, they receive the rain, and are otherwise acted upon by the heat in warm weather, resulting in dangerous effluvia. The sanitary authorities are endeavouring to lead to

the substitution of water-closets, and in some quarters have succeeded. Until an entire change of system takes place, ill health and other evils will be inseparable from these old tenemental dwellings. In the meantime, the old ashpits should be reduced in size, and enclosed. Frequent cleaning is a necessity, but where large ashpits and cesspools exist the cleansing is at long intervals, thereby adding to the danger that necessarily accompanies filthy surroundings. The street scavenging of Dublin is very limited and imperfect in its range, and no regular system of domestic scavenging at all exists, though such a system has been long in contemplation by the Corporation. The refuse receptacles of the houses of the poor, and their back-yards, with the lanes and courts where they reside in large numbers, should be cleaned often, and the latter daily. The subsoil of large areas of Dublin, covered by tenemental houses, is saturated by leakage and percolation, and has been so for long years. Health and a low death-rate are impossible under such conditions as we have described. The Liffey purification and a judicious system of main drainage suited to the circumstances of the city are still in abeyance, and little progress seems to be made in expediting the beginning of the necessary works.

We long since indicated what ought to be done. If the sewage of the city is not utilised for irrigation, reclamation, and agricultural purposes, but sent out to sea, much valuable fertilising material will be lost. If it be sent out to sea, there seems to us to be only one practical and efficient plan for an outfall whereby the sewage could be got rid off without the danger of its drifting back again in part into the harbour and river. For the north city and suburbs the outfall should be outside the Head of Howth, and for the south city and environs the outfall should be outside Dalkey Head. These two outfalls, of course, will necessitate long lines of outfall sewers, but the suburban townships on either side of the bay are extending rapidly, and their wants and the wants of the future will need to be provided for. It is manifestly clear that the sewage of Dublin cannot be poured into the harbour; and as it cannot, the other plan must be adopted if safety and efficiency are to be secured.

The building trade and cognate industries have not been brisk of late in Dublin, though a limited number of suburban villas are being erected in the northern and southern suburbs. Want of employment is apparent in various trades. The Corporation is erecting a public abattoir in the north-western end of the city, and it is to be hoped that the sanitary authorities will compel the butchers to use this necessary building, for the majority of the present private slaughter-houses are a positive disgrace and danger to the city. Another abattoir will be needed for the south side of the city. The cost of the new abattoir is estimated at 15,000*l*. The approach to the new swivel bridge on the south side on the plan intended by the Corporation is put down at 20,000*l*. If the very old and wretched dwellings we previously alluded to in the vicinity of the new swivel bridge are cleared away in opening the new approach, the improvement will be a real one. An improvement has lately taken place in the condition of the dairy-yards of the city by a system of supervision; but much remains to be accomplished before the dairies, cow-sheds, and milk-shops of Dublin can stand the test of a fair inspection. Public baths and washhouses have long been needed, and a loan is being sought by the Corporation for providing some. The old markets of Dublin have long become unfit, both structurally and on sanitary grounds. Indeed, the butchers deserted some of them years ago, and spread themselves over the city, many of them converting their back-yards into slaughter-houses. An extensive new market has just been completed in South Great Georges-street, called the South City Market, erected by a public company. To all appearance, it is suited for its purpose; but whether the public will take to it, so that it may prove a success, it is difficult to say. The old city or parochial graveyards in connexion with the churches are in most instances demoralising pictures of unchristian and unsanitary neglect. In summer they are pathless with rank vegetation, and in winter dismal with decay and rottenness. Surely several of them with little cost could be converted into ornamental gardens and health-spaces for the poor populations that surround most of them. The weak point of municipal administration in Dublin is procrastination and the want of decision. The Corporation has secured several useful Acts, and issued from time to time a number of unexceptionable rules and regulations; but, alas! it has not enforced them for various reasons well known to itself and others. Its recently-confirmed "Building By-laws and Regulations" are already almost a dead letter, and thus speculative building irregularities are rife, and some of the wrong-doers are members of the Public Health Committee. In other directions the same fatal policy is pursued by the municipal body. The sanitary defects of Dublin are many, and her wants great, but we could not cover them all in a paper or two. We have endeavoured to truthfully describe the aspects of the city as we found them and as they exist at the present hour. If much drunkenness, poverty, and crime is evidenced, a large amount of it may be truly put down to the wretched state of the homes of the people. Long years of sanitary and other neglect have borne their fruits, and the dismal harvest is being reaped in a continuously and abnormally high death-rate, and the chronic ills that doom a large number of the poorest of the population to vegetate or drag out their lives in a kind of living death.

A FRENCH CRITIC ON ENGLISH ARTISTS.

FEW French art-critics who have expressed their opinion of foreign—especially of English—art, have been in the habit of exercising the complimentary tone for which Frenchmen in the old days were proverbially famous, and it has very often happened that the expression has been so mixed up with evidence of want of care in obtaining a knowledge of the simple facts, that those who have read their remarks have scarcely regarded them as worth any serious attention. Some years ago, however slightly English artists were acquainted with French art, French artists were altogether unacquainted with, and not in the smallest degree anxious to know anything of, English art; but, of late years, a very different feeling has existed both in England and France, and especially with the landscape-painters the story has been often told how much French landscapists have learnt from our great English masters. We have not unfrequently had occasion to smile at the complacent criticisms of French visitors to our London exhibitions. It is not often that we find remarks so unprejudiced and thoughtful as those which have appeared in the June number of the *Gazette des Beaux-Arts*, and we are led to quote at some length the remarks of M. Duret on the two exhibitions of the Royal Academy and the Grosvenor Gallery.

Of course, we in England understand the worth of M. Duret's statement that by the mutual situation of our two London exhibitions "the terror which weighs on certain French painters of being refused at the *Salon*, and thus strangled, is unknown to the English artist;" but we strongly suspect that French readers of the *Gazette des Beaux-Arts*, unacquainted with the details of our Academy system, will be somewhat misled by such a picture of artistic bliss. Of the representatives of "classic art," Sir Frederick Leighton and Mr. Poynter, our critic has not much to say; they occupy in our school, he remarks, relatively the position held in France by M. Cabanel and M. Bouguereau. In his estimate of the President of the Royal Academy, M. Duret is not enthusiastic; he considers, however, all praise is due to an artist whose endeavour is to impregnate the old traditional forms with a new spirit. Of Mr. Poynter's work our critic is evidently no admirer. To Mr. Millais and Mr. Watts, he next turns his attention, and his remarks, while in themselves open to criticism, merit at least examination. Our critic fully assents to the position Mr. Millais occupies on the score of the wonderful series of works he has produced, "but," he continues, "the infatuation of the public surpasses all bounds, when it seeks to place him absolutely without a rival, to make of him a great master."

This view of a French critic is explainable. It is difficult for the English critic to appreciate the reputation of painters who hold in France an equivalent position to that of Millais, such painters as Baudry or Carolus Duran; they, we suppose, however, are as thoroughly national in their spirit, as Millais is English; hence, we imagine, the mutual misunderstanding, though we suspect that the future, which will judge the question in a completely unbiassed manner, will decide without hesitation in favour of the English painter. Our French critic recalls in warm terms the work of Mr. Millais in his pre-Raffaellite days, and contrasts with its careful, forcible, expressive character, the work the painter now exhibits, "hastily produced with the least possible amount of previous reflection, approaching manufacture"; and, after some severe remarks on the interesting series of exhibits with which Mr. Millais has been lately delighting the public, says, "when we recall the old pictures, bold and vigorous, that Millais painted, and see what he produces now, we feel inclined to say, 'Paint us, as formerly, the pictures in which you sought to please yourself and not the public.'" We only regret that M. Duret, as a Frenchman, finds nothing more to say in praise of a painter who, like Millais, in spite of having been so long a favourite, continues to paint so nobly; far less success gained by an artist on the other side of the Channel would have long since spoilt and ruined his productive powers; it is, indeed, given alone to the favoured few, in art especially, to withstand the fatal effects of what is understood by success.

Mr. Watts is the next artist to whom our French critic turns his attention, and very complimentary are his studied remarks on that cultivated artist. Mr. Watts's technical difficulties of execution and uncertainty as to methods, in our critic's view, are, however, easily traceable in the painter's work: "While his broad and simple drawing has remained throughout constantly the same, his processes of painting have frequently varied. The want of success that has followed some of his works," remarks M. Duret, "is due to the fact that each time he is face to face with his model, he sincerely endeavours to place it as living as possible on his canvas; it is only those who have created themselves a conventional manner once for all, who accustom themselves to a process, and are contented with a mean, who never excel themselves and never feel deceived."

Mr. Whistler, to whom a few words are devoted, is, we might observe to M. Duret, scarcely an English artist. The remarks on Mr. Albert Moore, though somewhat severe, will, we suspect, be in accordance with the opinions of not a few readers. Admirers of the school of which Mr. Dante Rossetti was the founder, and of which Mr. Burne Jones was once the humble follower and now is the high priest, will read with interest the remarks of a foreign critic on this peculiar phase of English modern art; but on the sickliness of some of its productions,—and Professor Richmond's work comes in for a share of reprobation,—our French critic is quite as severe in his remarks as are some of his brethren on this side of the Channel.

Here M. Duret stops his criticism,—and we have mentioned all the names to which he has devoted any notice,—having exhausted, so he tells us, the "list of English painters whom everybody would place in the first rank as original artists." The list is short, and there are some rather characteristic names omitted; it is not a difficult thing, apparently, for a French critic to exhaust the Royal Academy and "the Grosvenor."

The water-colour artists, as M. Duret remarks, are represented at our two leading exhibitions, only in a very fragmentary manner. We feel sure that many of our readers will agree with our foreign critic in regretting the absence of any exhibition of the works of our book and paper illustrators, who, as M. Duret observes, have struck on "a vein full of savour and originality"; but it is to Mr. Keene, of *Punch*, that our critic devotes his warmest encomiums. While it is gratifying to read such praises as conclude M. Duret's article, it is matter for reflection that perhaps the first well-understood criticism on the work of Keene should reach us from beyond the Channel. We do not think, however much our exhibitions may rouse sadly differing views, that our critic's remarks on Mr. Keene will awaken the spirit of opposition,—"What drawings! full of force, of accent, of raciness, broadly treated and simple. This is high art (*voilà du grand art*), living art, which has its roots in the depths of human nature." Our witty contemporary,—who, by the way, is our contemporary in existence almost to a year,—requires by this time none of the aids of ordinary advertisement, but we think that when M. Duret closes his article with the following words, *Punch* may

look for a somewhat increased circulation on the other side of the Channel: "If you wish to see the English, living, moving, and breathing, *à l'anglaise*, touched off to the life by a thorough-going Englishman, who has borrowed nothing from ancient Greece and Italy, take *Punch* every week and look at the drawings signed with a C and a K interlaced."

It is not, as will be seen, a very comprehensive view of English art that has been presented to the readers of the *Gazette des Beaux-Arts*, but with the amusing indifference which prevails in France as to the existence of a great art movement in this country, we must be thankful to any French writer who is bold enough to dare to try and interest any of his countrymen in the successful doings of our artists.

INTERNATIONAL MEDICAL AND SANITARY EXHIBITION.

THE Exhibition formed in the Quadrant Galleries of the Royal Horticultural Gardens is now in shape, and will be opened formally on this Saturday morning, the 16th, by the President, the Right Hon. Earl Spencer. It includes 472 exhibitors, the majority of whom send matters in which our readers are greatly interested, and should be largely visited. Two classes of awards will be made, viz., "First Class," and "Award of Merit." The judges began their work on Thursday, but it is not likely that the awards will be made until after the opening. We shall hereafter give particulars of some of the principal exhibits. The following is the programme intended to be observed on the opening day:—

At half-past four o'clock the President, the Right Hon. Earl Spencer will take the chair.

Report of the Executive Committee of the Parkes Museum of Hygiene, to be read by the Honorary Secretary, Dr. G. V. Poore.

Statement of the Exhibition Committee, to be read by the Secretary, Mark H. Judge, Esq.

Addresses by the Right Hon. Earl Granville, K.G.; the Right Hon. John G. Dodson, M.P.; and Sir James Paget, Bart., D.C.L., LL.D., F.R.S.

PRESIDENT TO DECLARE EXHIBITION OPEN.

Vote of Thanks to the Right Hon. Earl Spencer, for presiding, to be proposed by George Godwin, Esq., F.R.S., F.R.I.B.A., seconded by John Erichsen, Esq., F.R.S.

The Hungarian Band will play in the arena, and the Picture Gallery, with Fine Arts Collection, will be open for promenade.

The Exhibition will be open till dusk, and at six o'clock the Hungarian Band will play in the Conservatory.

Some misunderstanding having arisen as to the delivery of the exhibits by working plumbers in competition for the prizes offered in connexion with Mr. Hellyer's lectures, we are requested to say that the work of any plumber will be received and placed in position if he sends his name and address with his proposed exhibit. Parcels should be addressed to Mr. Mark H. Judge, Exhibition-road, South Kensington. Such exhibits must be delivered by Tuesday next, so that they may be included in the appendix which will be published with the second edition of the catalogue. Season tickets will be issued to exhibitors when the exhibits are received.

CHARTLEY.

THE disproportion between the interest they excite and the intrinsic worth of their remains is characteristic of the ruins of our old castles. A broken-down tower, a few yards of shapeless wall, provided they are of undoubted antiquity, enhance the value of a whole district. The eye continually reverts to the solitary elevation on which they are mouldering away.

This is the case with all that remains of Chartley Castle after the lapse of more than 600 years. It stands upon one of a group of grassy hills between which wind slender streams that have their source in the neighbouring uncultivated moorland—the "mighty large parke" of old Leland,—and unite at length in a tolerable-sized lake in a contiguous hollow in front of the modern mansion of Earl Ferrers.

The high road runs at the foot of the hill, and sweeps of grassy meadows rise gently from it to the margin of the castle moat. The only prominent part of the ruins,—indeed, almost the only remaining part in any state of preservation,—are two lowish round towers standing near together, and connected by a short length of curtain-wall. They are a fragment of the defences of the castle on its southern face. These twin towers of grey masonry are conspicuous objects from the wide valley of the Trent, across which they look to the waste of Cannock Chase. Their bleached circles are made more prominent by the elms and ashes and black yews that shelter them, rooted everywhere on the slopes and along the margin and in the bed of the half-filled moat. Abundant ivy overruns what are now only heaps of stones, the shapeless "cores" of other walls and towers that have disappeared. There is an indestructible charm in the curves of the masonry of a round tower. The circle can afford to dispense with ornament when no other form can. The diameter of these towers is nearly 50 ft. They are two stories in height above the original level of the castle court or bailey, and formerly they may have been considerably higher; but the wild weeds and chance-sown flowers have long taken the place of their ancient cornices at a reduced level. Their external faces of ashlar masonry are well preserved; the courses of small well-fitted stones are nearly perfect. The projecting base-courses that rise direct from the slope of the moat are intact. Only some of the arrow-slits higher up have suffered. Those portions of the towers that faced inwards to the castle court, and were built square, are utter wrecks, though fragments of their walls remain, with window-jambs and sills still *in situ*, and there are steps down to a level below that of the court outside.

The steep mound to the west of the castle area, belted with waving yew-trees, marks the position of the ancient keep. The original masonry has disappeared, and brickwork of modern date has taken its place.

The successor of Hugh the Wolf of Chester, Ranulph de Blundeville, was the builder of Chartley. He began it in 1220, building as well about the same time upon the rock of Beeston. But Chartley quickly passed by marriage into the hands of the Earls of Ferrers, who held it in conjunction with the neighbouring castle of Tutbury. Neither in position nor extent can Chartley vie with either Beeston or Tutbury,—Beeston on its lofty solitary rock, visible to half Cheshire; Tutbury, on its green hill, planted in a loop of the double-branched Dove.

In 1266 Robert Ferrers, Earl of Derby, lost Tutbury, and was stripped of all his other possessions with the exception of Chartley, the result of his fruitless struggle against Henry III. It was about that time that he gave the advowson of the little church of Stow to the Priory of St. Thomas, on the river bank by Stafford, for the welfare of the souls of his wives, Mary and Eleanor. Stow Church, with its squat tower, is not visible from Chartley, an intervening hill shutting it out; but it is worth a visit for the sake of its Norman chancel arch and the arch of its south porch, and for the tomb of Sir Walter Devereux, "Earl Ferrers and of Chartley," whose effigy lies extended between those of his two wives upon a well-preserved altar-tomb in the chancel. If the sculptor has faithfully portrayed his subject, we may infer that Sir Walter was a good man, with a particularly well-arranged head of hair. All three figures carry their hands upon their breasts, the palms pressed closely together, the finger-tips pointing upwards. A hush seems to pass from the monument over the church. It suggests reverent hope, and not, as is so often the case, the despair of death.

This same Sir Walter Devereux, who died 1558, was the builder of the "goodly manor-place" that stood "a good flite-shot" from Chartley Castle, that Leland commemorates in his "Itinerary." Chartley had passed to the Devereux by marriage in 1450. Plot has preserved a view of this "principal house of the Ferrars," which shows the interior of a court with a fountain in the middle, and three sides of a timbered building, with a corner porch and gabled oriels. Hither came Queen Elizabeth in 1575, and here, in 1585, Mary, Queen of Scots, was kept a prisoner for nearly a year, brought hither from Tutbury, and hence she passed to Fotheringay to die. This "ancient edifice" was destroyed by fire in 1781. It is a remark of Hawthorne's that, owing to the excellence of the Italian climate, it is difficult to realise the age of the classical remains there, and that an English ruin looks far older than the monuments of the Roman Forum. So it is with these remains of Chartley; they seem fabulously old in the midst of a landscape from which all similar relics have disappeared. Symbols of an age wholly passed away, they are aliens on the hill, while the leaves that thicken about them in spring-time, and the grass that waves up to their very feet, belong to a scene entirely pastoral.

To see Chartley and not to see "the park" that lies about a mile away would be a great omission, for they are united in interest, and boast an equal antiquity. Were the remnants of Blundeville's towers to be plumped down on that primæval moorland, they would have a background as little changed as themselves. The park has never been subjected to cultivation. It looks to-day as it did 1,000 years ago. The trees may have dwindled away, but it has known no other change. Needwood Forest, that lies a little distance off, is scarcely more than a name. It has been absorbed, and all its mighty trees have been cut down. The park remains, and may be accepted as a patch of original England. The wild cattle of Chartley, a primitive breed, whose appearance is a sufficient voucher for their antiquity, apart from tradition, are its occupants.

D.

THE GREAT CENTRAL HOTEL, CARLISLE.

ON the 2nd inst., the Great Central Hotel, on the Victoria Viaduct, Carlisle, was opened to the public with some ceremony. A large number of guests visited the house, upon the invitation of the proprietor, Mr. Westmorland, of Liverpool, inspected the arrangements, and partook of luncheon. The new hotel, which takes its name of the "Great Central" from the circumstance that it is close to the Viaduct entrance to the enlarged Central Station, consists of four stories, in addition to basement and attics. Entering the main door from the Victoria Viaduct, the visitor finds a long corridor in front of him. On his right is a commercial room (45 ft. by 20 ft.), well lighted both by day and by night; and on the left a coffee-room (35 ft. by 20 ft.). In both rooms, as indeed in all the large rooms of the house, the Westmorland-Birkett patent ventilator has been adopted. Passing along the corridor, the grand staircase is reached, a view of which is commanded from the window of the "bar" on the opposite side of the corridor. A smoke-room is attached to the bar, and further along the corridor on the right hand side we come to a large room (33 ft. by 20 ft.), which is to be devoted to the use of farmers on Saturday. On the opposite side of the corridor are the manager's sitting-room, still-room, back stairs, lavatories, and at the end of the corridor two swing-doors admit the visitor to a billiard-room (45 ft. by 25 ft.) fitted with three tables. On the first floor are the ladies' coffee-room, situated immediately over the commercial room; four sitting-rooms with waiting-rooms and bedrooms; and, at the opposite end of the corridor, over the billiard-room, an assembly-room (45 ft. by 25 ft.). In all seventy-five beds can be made up in the hotel. In the basement there is a restaurant, 45 ft. by 20 ft., approached either from the Viaduct or through the hotel, smoke-room, travellers' stock-room, and kitchens. The architectural character may be described as "Queen Anne." Mr. Westmorland executed most of the work himself, but he let some portions which may be specified. Mr. Anderson, of Glasgow, executed the plumbing; Mr. Ormerod, of Carlisle, the cement corridors and floors; Mr. Ferguson, of Carlisle, the plaster work; Mr. Graham, of Carlisle, the iron work; Mr. Waddell, of Carlisle, the electric bells; Messrs. Forest & Son, Liverpool, supplied the ornamental glass; Messrs. Holgate & Fishwick, Liverpool, the bar-fittings. The walling stones, of white Lazonby, were supplied by Mr. W. Graves. The stone carving was done by Mr. Gedling, of Carlisle. Mr. Daniel Birkett, F.R.I.B.A., of Carlisle, was the architect.

Large Figures.—At the thirtieth annual meeting of the Birkbeck Building Society, held on July 7th, the report presented stated that the receipts for the year ending 31st March last were 7,147,763*l.* or an increase of 1,437,831*l.* over those of the previous year, and the total from the commencement of the Society 56,942,588*l.* The deposits reached the large sum of 5,789,998*l.* The gross profits earned by the Society amounted to 108,721*l.*, of which 89,759*l.* have been appropriated to the payment of interest on shares and deposits, discount, and expenses of management, leaving a net profit of 18,963*l.*, which, added to the previous balance, brings up the total of undivided profits to 132,211*l.* to be dealt with next year, when the triennial bonus has to be declared. The surplus funds are described as amounting at the present time to 2,196,750*l.*

OUR IRON AND STEEL INDUSTRIES.

BEFORE the tardily-published "Mineral Statistics," we have, in the report of the British Iron Trade Association, now issued for the past year, a mass of fact in regard to the Iron, Steel, and allied trades, and the importance of these trades, as well as the peculiar interest that just at the present time attaches to them, make a summary of some of the semi-official statements given in the report alluded to of more than common interest. The report gives what must be considered accurate details of the production and importation of iron ore, of the production of iron and steel, and a mass of other facts. One of the most notable of the features in one of the branches of the trade is the large importations of iron ore. It is shown that whilst twelve years ago the importations of iron ore from other countries were to the extent of 114,435 tons only, last year they were to the extent of 2,634,401 tons, a rate of increase far above that of the production of iron, so that it is evident that there has been an increased proportionate use of the foreign ores—chiefly of those of Spain. It is believed that the production of iron ore in the United Kingdom was to the extent of 17,300,000 tons last year; and hence it is apparent that of the total iron ores used in the country, about 13 per cent. used was imported. South Wales received the largest portion of this imported ore, but it is significant that over 658,000 tons were received for use in the Cleveland and Durham iron-making district—the district in which our largest supply of iron ores is found. Hence there is the strongest possible proof that the rich, if dearer, ores of Spain and Algeria are used in very great quantity, and this is one of the tokens of the spread of the steel industry and of the manner in which it is pushing out the use of iron for certain purposes.

Without giving the exact quantities of iron ore produced in the different districts to yield the above-stated total, it may be said that out of that total, Cleveland yielded 33 per cent., Lancashire and Cumberland 15 per cent., Scotland 17 per cent., North Staffordshire slightly less than 10 per cent., Lincolnshire under 5 per cent., Northamptonshire 8·5 per cent., South Staffordshire 3·4 per cent., and South Wales 2·5 per cent. It is worth while adding that a very small part of the iron raised is exported,—about 100,000 tons having been sent out of the country last year, nine-tenths of that quantity being sent to the United States. Coming to the production of pig-iron, we are told that whilst in 1879 there were produced 6,009,434 tons of pig-iron in Great Britain, last year there was the vast increase to the production of 7,721,833 tons. Every one of the large districts in the country contributed to that increase. Cleveland heads the list of the districts with a yield of over 2,510,000 tons, Scotland following with 1,049,000 tons; West Cumberland, 751,371 tons; North Lancashire, 745,934 tons; South Wales, 877,430 tons,—Staffordshire, 574,000 tons West Yorkshire, 285,000 tons; Derbyshire, 356,000 tons; and Northamptonshire, 167,000 tons, being the only large producing districts. It appears from a valuable return of the stocks of pig-iron in the hands of the makers that there were at the end of the year only 1,541,411 tons of pig-iron so held, or, in other words, the stocks so held were only equal to ten weeks' consumption at the rate of that of the past year. And vast as was the production of pig-iron last year, it was with a portion only of our smelting-plant, for though there were 573 furnaces in operation, there were no fewer than 394 others idle. It may be added that in the Cleveland and Durham district, the average production of each furnace has been raised from 16,000 tons yearly to over 22,400 tons yearly, whilst the average output of the Scottish and other furnaces has also greatly risen. The uses of this iron have been very varied, but the greatest variation from that of the previous year was in the great enlargement of the quantity converted into Bessemer steel.

As to the manufacture of pig-iron, we have a mass of statistics. Those of the Cleveland and Durham district are the most complete, and from these it appears that, in 1879, the associated makers in that district produced 293,000 tons; last year 508,000 tons were made,—the increase being the most marked in the plate and angle trade, and this has been at generally higher rates than that of the previous year. Roughly, it is stated that, whilst the selling price of the manufactured iron in this great district was, for the year 1879, about 1,587,000*l*., last year it rose to 3,029,000*l*. In Wales there was also a growth in the trade,—a growth to the extent of 85,000 tons on the year. It is believed that this was a general experience of the districts that yield large quantities of manufactured iron. Coming to the steel trade, we are told that last year not less than 1,044,000 tons of Bessemer steel ingots were produced in the United Kingdom,—an increase of 209,000 tons on the output of the previous year. The largest addition to the production is in the Sheffield district, next in that of the north-east, and next in that of South Wales,—these three districts giving over 176,000 tons of the increase. From part of this, the greatest production of Bessemer steel that has yet been known in the kingdom, there were rolled 739,000 tons of steel rails, South Wales producing the largest quantity, and next Sheffield; the other large producing districts being those of Sheffield, Lancashire, Cumberland, and the north-east. And, large as was the production of Bessemer steel, it appears that it was from seventy-eight converters out of 106 erected in the United Kingdom, the remainder having been idle. For the first time in the history of the Bessemer steel trade, Great Britain took only second rank as a producer, the United States exceeding our output, but by a few score of tons only. The second great branch of the steel trade is that of the open-hearth steel manufacture. Of this class of steel it appears that, last year, there were produced in the United Kingdom 251,000 tons, or 76,000 tons more than in the previous year. Practically, this is produced by the districts named above as the makers of Bessemer iron, South Wales taking the lead, and being followed, in the order given, by Scotland, Sheffield, Lancashire, and Cheshire, the north-east coast, and some smaller districts. There are now, it appears, 126 open-hearth furnaces in the United Kingdom, and, in addition, seventeen others are in course of construction, so that not only is it apparent that Great Britain is at the head of the Siemens steel trade, but that it means to remain so. These are the chief of the fresh facts brought out by this valuable report, and it is worth notice that the general tone of the teaching of the facts presented is less unsatisfactory than had been believed. The great production of iron and steel in the past year was nearly all put into consumption; and with a comparatively favourable year last, it may be hoped that there will be in the present a continuation of the recovery in our trades.

PROJECTED ROUTES ACROSS THE ALPS,

AND A FORECAST OF THE RAILWAYS OF THE FUTURE.

AMONG the abstracts of papers from Foreign Transactions and periodicals prepared for the forthcoming volume of the Proceedings of the Institution of Civil Engineers (which will form vol. lxiv. of that valuable series) will be found notices of the several views advocated by M. Colladon, by M. Maimeri, and by M. Lommel, as to the Trans-Alpine communications between France and Italy, of the different projects for which we gave some account recently (vol. xl., p. 692). These are taken, the first from the *Revue Universelle des Mines*, the second from the Italian journal *Il Politecnico*, and the third from a paper presented by M. Lommel to the Swiss Scientific Society, at a recent meeting at Brique.

The main reason, according to the Italian journal, for constructing a fresh line of communication across the Alps, intermediate between Mont Cenis and Mont St. Gothard, is to prevent the injury which France would sustain by the threatened diversion of traffic to the latter route. A railway taking the Mont Blanc route would lie altogether within French and Italian territory, while the Simplon line would run for eighty-three miles through Switzerland.

The east of France, of which Dijon is the principal centre of railway traffic, is the district chiefly affected by the line of route to be determined. Signor Maimeri has taken Collonges, a station about fourteen miles west-south-west from Geneva, and six miles from Bellegarde, on the Rhone, as a starting-point on the French side, and Milan as the corresponding centre in Italy. Between these points, the length by the Simplon is stated as 244 miles, including eleven and a half miles of tunnel at the summit. The equivalent length to be added for the resistance of the gradients is stated at twenty-one miles, making a virtual total of 265 miles.

The Mont Blanc route is seven miles shorter, as measured on the ground, than the former. The summit tunnel is three-eighths of a mile longer; but the allowance of forty-one miles necessary for gradients, according to Signor Maimeri, gives a virtual length of 278 miles, or thirteen miles more than the Simplon route. A third line is proposed by M. Maimeri and M. Stamm, involving a Mont Blanc tunnel of nine and a quarter miles, and with a measured length of 214 miles; the allowance for gradients on this route is forty-eight miles, giving a virtual length of 262 miles.

For the Simplon Tunnel, the average gradients of approach would be one in 250, and one in 205. The projected tunnel would be from 1,140 ft. to 1,650 ft., or even 1,950 ft., less elevated above the sea than the St. Gothard, the Brenner, the Mont Cenis, the Arlberg, or the Mont Blanc summits (as the latter is regarded as practicable by M. Colladon). The average gradients of approach to the latter tunnel, according to this writer, are one in 85, and one in 130.

Length of line, height of summit, and severity of gradient are, however, points as to which the comparison assumes the practicability of executing the line. This, however, is not all plain sailing. As far back as the year 1879, Dr. Stapff, the engineering geologist of the St. Gothard Tunnel, communicated to the *Revue Universelle des Mines* some very interesting observations as to the increase of temperature underground, as determined, not by height above sea-level, but by depth below the superincumbent surface. From a wide experience, in Mexico and the United States, as well as in the St. Gothard Tunnel, Dr. Stapff came to the conclusion that a heat of 104° Fahrenheit, being about 6° Fahrenheit above the ordinary heat of the human body, is the highest temperature at which work can be continuously effected by manual labour. The highest temperature observed in the Mont Cenis Tunnel was 86° Fahr. That in the St. Gothard Tunnel is stated by Dr. Stapff at 87° Fahr. on the south side, in air surcharged with moisture, and 84° Fahr. on the north, in air not quite so moist. But higher temperatures were said to have been attained at the time of the completion of this tunnel since the publication of the above paper, of which we have no exact record.

The rate of increase of temperature with depth depends on the cross section, as well as upon the longitudinal section, of the surface above the point of measurement. Thus, comparing equal depths below a mountain peak, or below the bottom of a valley, the heat would increase proportionately much faster in the latter case. As a mean, Dr. Stapff proposes the allowance of 1° Fahr. for every 88·1 ft. in depth below the surface, the increase being less below a peak, and more below a hollow.

For the higher and shorter tunnel, proposed by M. Stockalper through the Simplon, at a height of about 2,560 feet above sea level, M. Stapff estimates the depth below the ridge at about 5,900 feet, and the rock temperature midway in the tunnel at 104° Fahr. But in the longer and lower tunnels projected by Messrs. Favre & Co., and by M. Lommel, the depth below the ridge would be 7,300 ft., and the temperature midway 116° Fahr. for the rock, and 127° Fahr. for water issuing from the rock. The utmost cooling effect produced in the St. Gothard tunnel, when four rock drills were at work, discharging exhaust-air at from 2½ to 4 atmospheres pressure, did not exceed 7° Fahr., and during the clearing away of the material excavated the heat of the air continued to rise to as much as 7° Fahr. above the rock temperature. It is evident that this carefully collected experience can only be neglected at the peril of any projectors. M. Lommel argues from some statements as to the temperatures in the Comstock mines, Nevada, that the air temperature can be kept as much as 14° Fahr. below the rock temperature. He has, however, made no allowance for its occasionally rising higher.

The estimate of Signor Tatti, a colleague of M. Colladon, for the Simplon tunnel of 11½ miles long, is about 3,600,000*l*., or about 313,000*l*. per mile. To this has to be added 150,000*l*. for connecting the northern end with the present railway terminus at Brique, and 640,000*l*. for 12½ miles of line from its southern end down to the railway terminus at Domodossola, making a total of 4,390,000*l*. for the entire work. For the Mont Blanc tunnel of 11⅛ miles, he allows the same sum of 3,600,000*l*., to which he adds 1,136,000*l*. for 22½ miles of line at the southern end, and 2,054,000*l*. for 49¾ miles at the northern

end, making in all 6,790,000*l.* Signor Maineri considers that the work could be done cheaper. He estimates the Mont Blanc tunnel of 9¼ miles at 2,646,000*l.*, being at the rate of 164*l.* per yard, that estimated for the St. Gothard tunnel. From the southern end to Aosta he reckons barely 22 miles of line at 32,000*l.* per mile, and from the northern end to Cluses he takes as 26¾ miles more at the same rate. The 13½ miles from Cluses to La Roche he puts at 25,600*l.* per mile, making a total for the route of 4,555,200*l.*

It must be evident to any careful observer that a halt ought to be called in any projects as to new lines through mountain passes, in presence of the recent discoveries in the transmission of electricity, and in its application to railway traction. At least, 2,000 h.p. of water power is said to be available at each end of the proposed Simplon tunnel; and in the other lines, no doubt, water power is almost equally attainable. The reduction of a summit is a piece of work for which, mechanically regarded, it may be worth while to pay very heavily. But, on the other hand, the proportion of the weight of the engine to that of the trains increases so rapidly with the angle of the gradient that it would take less power to take carriages alone up a gradient, say of one in forty, than to run the same carriages as a locomotive train over a gradient of 1 in 100. Nor is there any corresponding drawback as to speed. If the enormous dead-weight of the locomotive can be, as appears highly probable, dispensed with, the entire problem of railway transit over mountainous country will have to be reconsidered. The commercial utility of expending large sums to secure good gradients will become a matter to be investigated anew. The main features of the case will be altogether altered. We do not say that this is yet the case. But we say that it has been shown certainly to be conceivable, perhaps to be possible. And if we add the hope of the solution of the two problems, that of the utilisation of water-power, and that of the traction of trains without locomotives, together, and suppose each of these problems to be ultimately soluble as dynamical questions, the days of long tunnels, deep cuttings, and lofty embankments for any new lines will be over, and the smokeless railways of the future will undulate over hill and dale with all the freshness and variety of the old coaching traffic, which had attained a state of such perfection on the Devon and on the Worcestershire roads just as the steam-horse was introduced to run the four spanking high-breds off the road.

ARUNDEL MONUMENTS, CHICHESTER CATHEDRAL.

THESE monuments stand at the east end of the nave, north aisle. The lithographs represent the effigies of these tombs, the one with the male and female figures representing Richard Fitzalan, 14th Earl of Arundel, and his countess, the former beheaded in 1397. The single female figure is believed to represent Maud, Countess of Arundel, who died in 1270; the figures are recumbent. The earl's tomb was restored in 1843 by the late Mr. E. Richardson, of London, the restorer of the effigies of the Knights Templars in the Temple Church, but that of the Countess Maud is much mutilated, and has not undergone any restoring process. My drawing, however, shows the figure as it would appear if restored. This effigy has been much admired for the beauty of the drapery. A cast in plaster was made of the tomb some years ago for the Archæological Society, and subsequently another for, I believe, the Crystal Palace.

W. HAYDEN.

Royal Archæological Institute. — The Royal Archæological Institute, of which Lord Talbot de Malahide is president, has arranged to hold its annual congress at Bedford this year, during the week which extends from Tuesday, July 26th, to Monday, August 1st. Among the places set out on the programme to be visited are Elstow Church, the home of John Bunyan, Houghton Conquest, Bromham, Woburn Abbey, Wrest Park, Luton, Dunstable Priory, the Roman camp and amphitheatre near Howbury and Sandy, St. Alban's Abbey, and the ruins of Old Verulam, Sharnbrook, Felmersham, Tottenhoe Castle, Willington, Cople, the earthworks at Bernard's Heath, and Risinghoe Castle. Mr. Charles Magniac, M.P., of Colworth Park, will act as president of the meeting.

ARCHITECTURAL AND ARCHÆOLOGICAL MUSEUM, BARCELONA.

BARCELONA is passing through the same vicissitudes which old and venerable cities mostly undergo at the hands of modern civilisation. Notwithstanding the great importance which the city enjoyed in the times of its early kings and during the Roman period, and the high position it has held in the history of the Spanish nation, and notwithstanding the fact, moreover, of its precincts having been adorned at one time with remarkable and beautiful palaces, convents, and other edifices of various styles of architecture of all ages, there scarcely remain now any of that number. Some are in ruins, others have disappeared entirely in consequence of political changes, while streets and squares have been opened on sites where formerly stood splendid monuments.

From this destruction, however, may be excepted the building called the Church of Santa Agueda, a lofty and well-shaped edifice, standing in the Plaza del Rey, adjoining the palace of the kings of Aragon, which is at present partly the convent of Santa Clara, and for which this church formerly served as the chapel. The walls of the edifice have recently been restored, its deterioration being caused partly by the events of 1835, partly by the use to which the building had been applied on several occasions. Such a use, unadapted to its preservation, was accelerating its total ruin, which, had it not been guarded against, in course of time would have resulted in irreparable loss. The preservation of this church is due to the praiseworthy exertions and zeal of the Provincial Committee of Monuments, which devoted its energy to attain this purpose, by collecting funds necessary to meet the heavy expenses involved, sparing neither pains nor means to make it appear at the present day precisely the same as it was in former times. The wishes of the Provincial Committee have been crowned with much success, and Barcelona is now proud to possess an historico-artistical monument, which will remind future generations of the authority and good taste of the sovereigns who maintained the dignity of the ancient crown of Aragon.

The Chapel of Santa Agueda is a work of the thirteenth century. It consists of a high and well-shaped nave of the Gothic style of that period, its roof being adorned with an ornamented ceiling. Admission to the choir is to be had by two staircases made through the walls of the edifice, one for women and the other for men. In the façade there are small windows, which are partly filled by painted glass containing representations of persons celebrated in the history of Catalonia. The belfry is one of the most noteworthy that exist in Barcelona.

Within this building the Museum of Architecture and Antiquities, founded by royal order, is temporarily installed. Its principal portion consists of the objects which formed the collection made by the Provincial Committee of Monuments, as well as those possessed by the Royal Academy of Belles-Lettres, thus making it a museum which, although not at present very comprehensive, is yet worthy of being visited by the lovers of art and archæological studies. It is to be hoped, however, that it will soon increase.

The specimens in the museum amount to 1,296 in number; they are not, however, arranged in separate sections, for want of sufficient room, a circumstance, too, which serves to prevent new acquisitions. On the side-walls of the chapel is shown an important series of keystones, fragments of pillars, and slabs containing inscriptions of the Middle Ages, and another of beautifully engraved medallions of the age of the Renaissance, shields of corporations, as well as those of the Catalonian nobility, and of the city of Barcelona, saved from the old buildings and convents lately pulled down. In the place formerly used as the presbyterium stand now, symmetrically arranged, some tombs of the Catalonian nobility and bishops. On the floor may be seen the valuable mosaic work found at Palau, in April 1861. It represents a Roman circus, 25 ft. long and 10 ft. wide, of which a description has been published in the *Musea Universal*.

Near the mosaic work, between two Roman pillars and various altars, is a statue in Greek drapery, beautifully arrayed. In the choir of the chapel is placed the collection of articles purchased from Don Eusebio Fortun, the Spanish consul at Arles, and which consists of a choice selection of pottery, arms, and articles of domestic use of the Romans, and various other objects of earthenware of Spain.

On the principal altar and its sides is to be seen an arrangement of variously ornamented frames of the fifteenth century, some of which possess merit, and are of historical importance, on account of having been paid for by Prince Dom Pedro of Portugal, pretender to the crown of Aragon.

On the outward side of this chapel stands a large collection of inscribed slabs, pillars, and Roman epitaphs, the former being very valuable, as an evidence of the political, religious, and social constitutions of the Romans. Besides these, there are also some fantastic gorgets,—large shields which had belonged to the demolished ramparts of Barcelona, and many slabs containing inscriptions in Hebrew, obtained from the mountains of Monjuich. There is also within the rails, within which these objects are enclosed, a tall pillar worthy of mention, belonging to the temple of Hercules, in Barcelona, and an emblem of nature worship, of colossal dimensions, held to be a rare specimen. Such is a succinct description of the illustration which we give in our present number.

FOXBURY, KENT.

THE mansion illustrated by the accompanying perspective view of the entrance front, and plan of the ground floor, is erected upon an estate of sixty acres, on rising ground to the right of the Kemnal-road, Chislehurst.

The external walls are built hollow, with Hassock stone rubble-work, faced on the outside with Kentish rag-stone laid in random courses, with a rock face, and lined on the inside with brickwork in cement. The masonry of the cornices, windows, doorways, &c., is of Combe-Down Bath stone, and the roofs are covered with Broseley tiles. The corridors throughout are of fire-proof construction, upon Fox & Barrett's principle. The principal rooms have been decorated with enriched panelled ceilings and characteristic high mantelpieces of oak, cedar, and walnut, inlaid with other woods, and the walls of the dining-room are lined with wood framing of pitch-pine.

The illustrations sufficiently show the general character of the architecture (which is that of the early part of the seventeenth century), and the arrangement and sizes of the rooms.

The principal entrance is on the east side, through an enclosed porch, paved with marble mosaic executed by Messrs. Burke & Co., leading into the entrance-hall, which is separated from the corridors and principal staircase by arcades of Portland stone.

The principal staircase, which is 19 ft. 6 in. square and 27 ft. high, has a wainscot oak staircase of three flights, protected by balustrades of pierced strapwork, with large newels at the landings, surmounted by heraldic animals after the fashion of those at Hatfield House and other houses of similar date. The staircase windows are filled with grisaille glass, having armorial medallions in the centre of the lights, carried out by Messrs. Heaton, Butler, & Bayne.

On the first floor, which is 11 ft. high, there are eleven bedrooms and dressing-rooms, and three bath-rooms, the servants bedrooms being arranged over the offices.

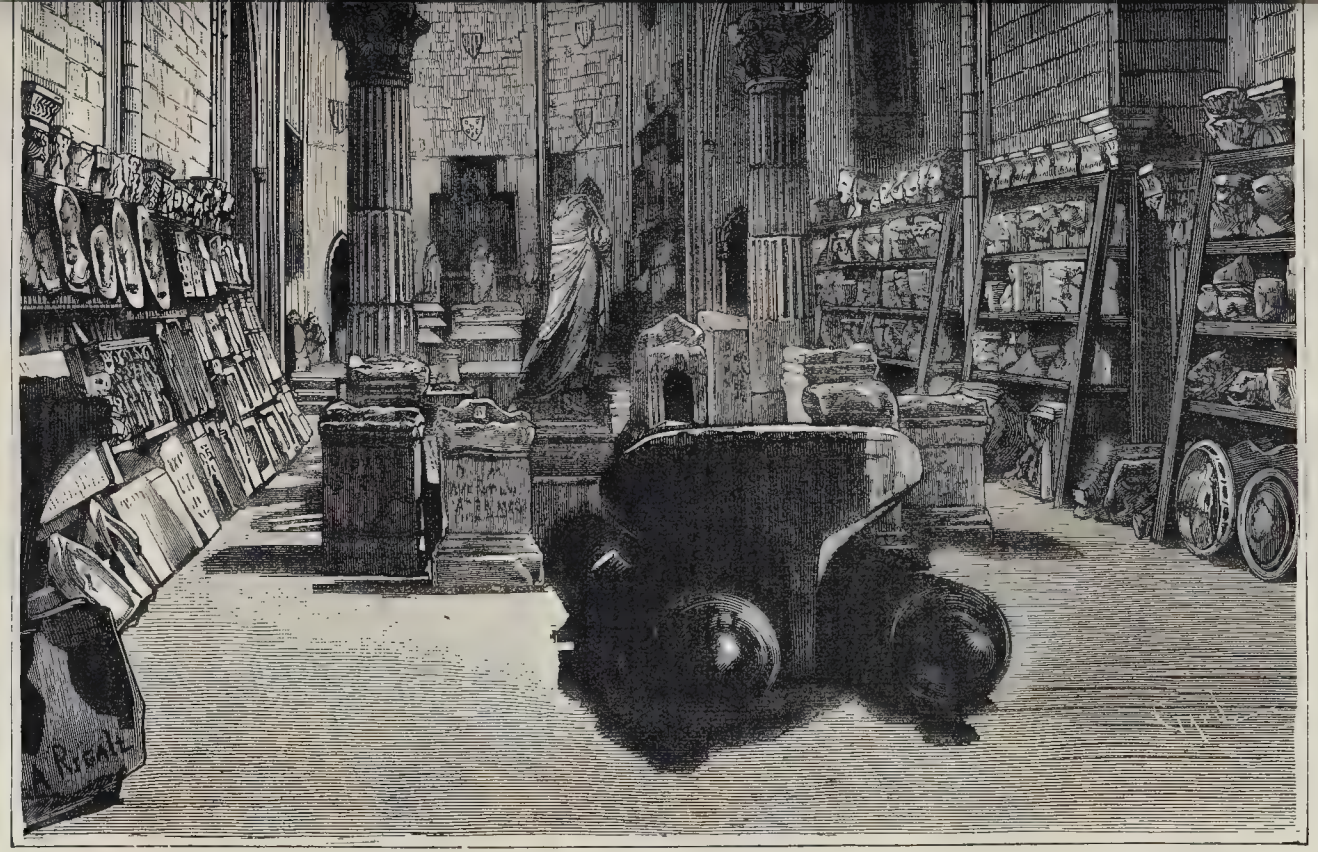
The basement-story is appropriated for the heating apparatus, wine, beer, and coal cellars, icehouse, &c.

The approach-roads and gardens were laid out by Mr. Milner, and lodges are placed at the junction of the carriage-drives with the Kemnal-road. The stables and kitchen-garden, with gardener's cottage and extensive greenhouses, are arranged on ground to the north-east of the mansion.

The whole of the works were carried out from the designs of Mr. David Brandon, by Messrs. Hill, Higgs, & Hill.

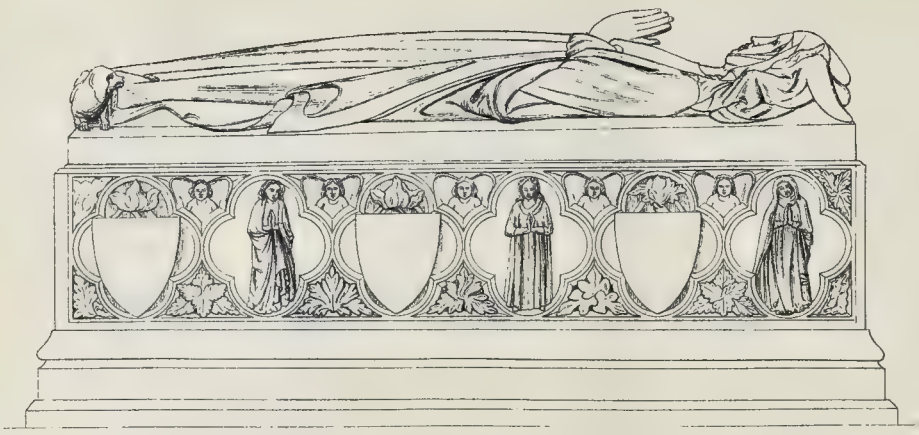
Fall of a Church Roof.—The roof of a church at San Mateo, Mexico, fell in during service on the morning of the 5th inst., killing over thirty of the worshippers present, the greater number being women. The church was being partially rebuilt, and while a party of men were working on the roof, one fell through, and the sudden rush of all the others at the same moment in their endeavours to get off, caused the remainder of the roof to collapse. It is reported that twenty of the workmen were killed, and that several were fatally injured.





THE ARCHITECTURAL AND ARCHÆOLOGICAL MUSEUM, BARCELONA, SPAIN.

The Church of Santa Agueda: Thirteenth Century.



Monument of a Lady, supposed to be Maud Countess of Arundel.



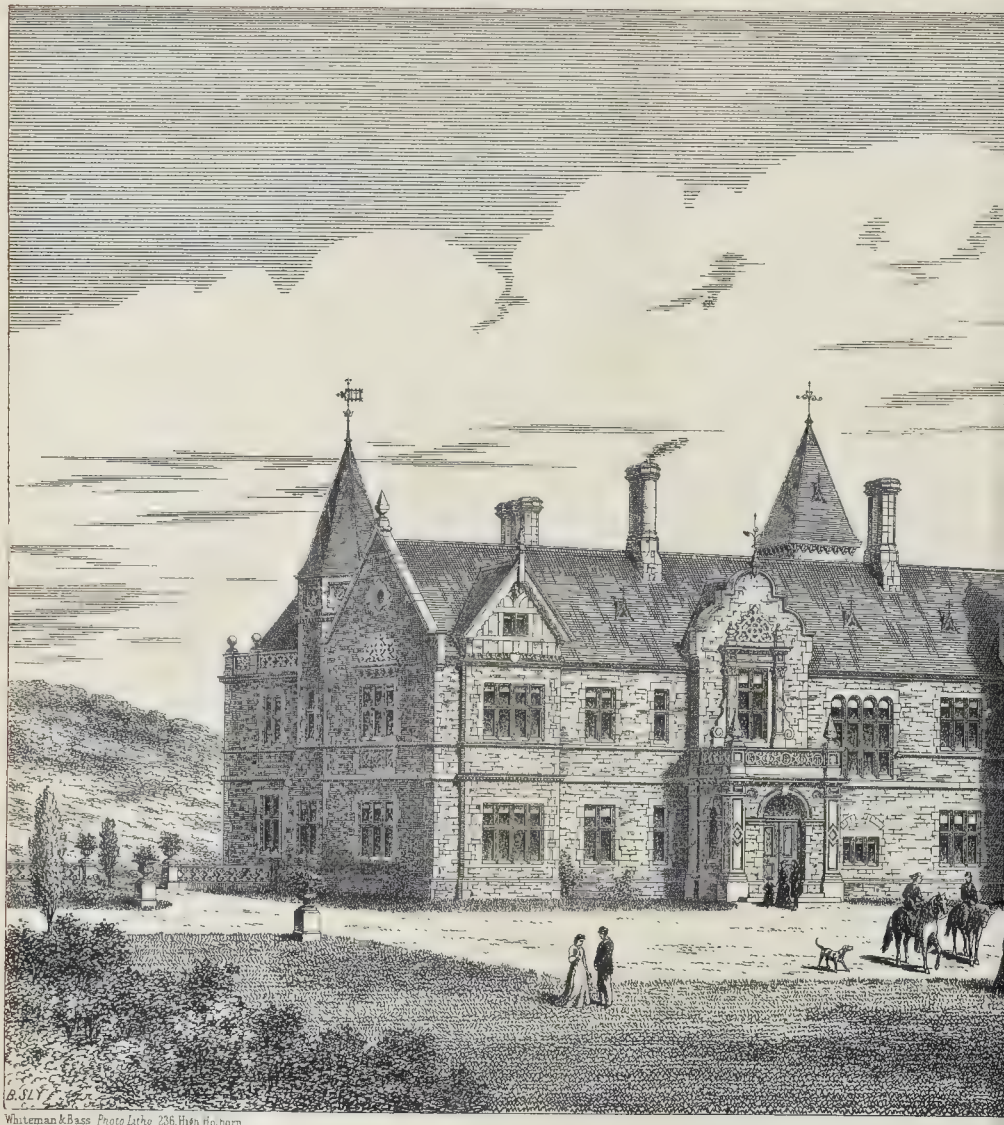
Richard Fitzalan, Fourteenth Earl of Arundel, and his Countess.



Lady, supposed to be Maud Countess of Arundel.

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ARUNDEL MONUMENTS, CHICHESTER CATHEDRAL.



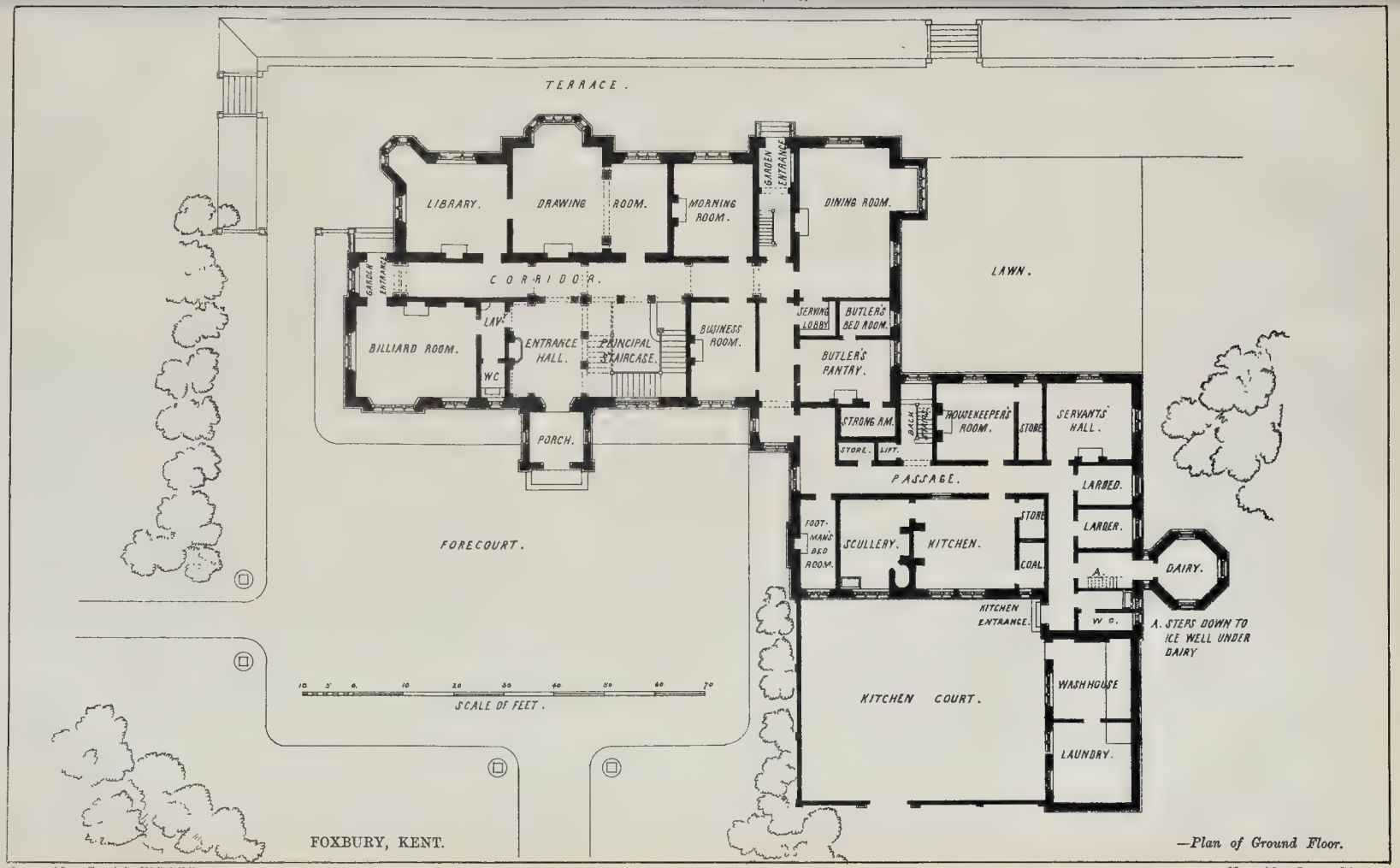
Whiteman & Bass *Photo Litho* 236, High Holborn

FOXBURY, NEAR CHISLEHURST, KEN



Wyman & Sons, Printers, Gt Queen St.

R. David Brandon, F.S.A., Architect.



—*Plan of Ground Floor.*

Whiteman & Bass, *Photo-Litho* 236, High Holborn

Wyman & Sons, Printers, Gt Queen St

SANITARY PLUMBING.

HOUSE DRAINAGE.

THE fifth* of Mr. Hellyer's course of six lectures to working plumbers, under the auspices of the National Health Society, was given by him on Tuesday evening last, in the Hall of the Society of Arts. Mr. Rogers Field, C.E., presided.

Mr. Hellyer said the last subject dealt with ("Traps and Trap Ventilation") extended itself so much that if he kept strictly to the syllabus for the present lecture he should have to drop out the first half of the subject which should be dealt with on the present occasion, viz., "House Drainage and Ventilation." He therefore proposed to deal with the question of house drainage in the present lecture, and to postpone the subject of ventilation to the last evening of the course, substituting a lecture on that subject for the one announced on "The Art of Lead-Laying," which lecture he proposed to drop entirely out of the course. In commencing the internal plumbing† of a house, plumbers generally began with soil-pipes, but before they could get such pipes ready for fixing they required to know the kind of water-closets to be fixed upon them, so as to arrange the branches and traps accordingly. Privies served their purpose well enough when every man had a garden or piece of ground; but when men congregated together in cities and towns, remote places for putting such conveniences could not be found, and drains and sewers had to be made into which the general slops of the house were thrown. Instead of building water-closets as we do now, the rich ancients used close-stools or pans, which were frequently made of gold, besides the water-closets which were made in vaulted recesses in their kitchens. The Romans placed vases called *gastra* upon the edges of roads and streets for the relief of passengers, just as we now fixed urinals. Water-closets were of very ancient date. In Sir William Hamilton's account of "Discoveries at Pompeii," he says, in a paper ‡ read before the Society of Antiquaries in 1775, "Close to the Temple of Isis is a theatre, no more of which has been cleared than the scene and the corridor that leads to the seats. In this corridor was a retiring-place for necessary occasions, where the pipe to convey the water, and the basin, like that of our water-closets, still remain, the wood of the seat only having mouldered away by time." Fosbroke, in his "Encyclopædia of Antiquities," (p. 397), says, "The water-closet in the Palace of the Cæsars is adorned with marble arabesques and mosaics; at the back of one is a cistern, the water of which is distributed by cocks to different seats." Olympiodorus says that in the Thermæ of Antoninus there were 1,600 seats of marble pierced like *chaises-percées* for the convenience of those who bathed.§ The fall of the Roman Empire led to the disuse of water-closets, and to a return to the customs of earlier ages. Beckmann says that in Paris, so late as the fourteenth century, the people had the liberty of throwing anything from their windows whenever they chose, provided they gave notice three times before by crying out "*Gare l'eau!*" This practice was, we learn, forbidden in 1395.‖ A like practice, however, seems to have continued much longer at Edinburgh, for in A.D. 1750, when people went out into the streets at night, it was necessary, in order to avoid disagreeable accidents from the windows, that they should take with them a guide, who, as he went along, called out with a loud voice, "Hand your han!" At that period, when the luxury of water-closets was unknown, it was the custom for men to perambulate the streets of Edinburgh, carrying conveniences (pails) suspended from a yoke on their shoulders, and enveloped by cloaks sufficiently large to cover both their apparatus and customers, crying, "Wha wants me for a bawbee?"¶ In a Parisian code of laws, which was improved in 1513, it was expressly ordered that every house should have a privy; but in the year 1700 they had not that convenience in every house, for at that time the police had instructions to see that each house had a privy, or to lock the house up if the occupants did not make one within a month. Sir John Harrington is credited by Nares with the invention of the English water-closet or latrine, in Queen Elizabeth's time, but Fosbroke says that was a mistake, though probably Sir John made them known in England. Aubrey, writing in 1718, describes a water-closet he had seen. He says,—"Here [at Sir Francis Carew's, Beddington, Surrey] I saw a pretty machine to cleanse an 'house of office,' viz., by a small stream of water no bigger than one's finger, which ran into an engine made like a bit of a fire-shovel, which hung upon its centre of gravity, so that when it was full a considerable quantity of water fell down with some force, and washed away the filth."* The first patent in this country under the laws of Patents for Inventions, was granted by James I. in 1617; but, according to the Records of the Patent Office, not a single patent was taken out for a water-closet until the year 1775, or 158 years after special licences were first granted for protecting inventions. In the year named, Alexander Cumming, a watchmaker, in Bond-street, took out the first patent for a water-closet, than which many water-closets in use at the present day were more unsanitary. The trap under Cumming's closet is shown by the drawing attached to the specification of the patent to have been a "round-pipe" or syphon-trap. Two years later (*i. e.* in 1777) Lemuel Prosser, a plumber living in the parish of St. Martin-in-the-Fields, took out a patent for what he describes in his specification as "a water-closet upon an entirely new construction, which will always remain free from any offensive smell." In spite of its inventor's claim, however, Mr. Hellyer thought that Prosser's closet was about as bad as the pan-closet, in being a closet which would never be entirely free from an offensive smell. In 1778 Joseph Bramah, of Cross-court, Carnaby-market, Middlesex, cabinet-maker, took out a patent for his invention of the now well-known valve-closet, which has since its inventor's time been improved in many points. But the difficulty of getting the "slider" of Cumming's closet, and the cranked metal valve of Bramah's, to always seat themselves so as to keep their basins fully charged with water, and to stand rough usage, led to the introduction of the pan-closet. William Law, a founder in Soho, made certain improvements in pan-closets in 1796. But such closets were not much used, though other improvements were made in them, before the early part of the present century. In 1826 William Downe, senior, of Exeter, also a founder, made further improvements in the pan-closet, reducing the size of the "container." One reason why the pan-closet had had a larger sale, and been more extensively used than any other closet, was that there were no valves about it, apart from its supply, to get out of order. It would also stand rough usage when well-made better than any other closet of its kind, but, on the other hand, it was the most unsanitary water-closet that the lecturer knew of, and ought never to be used. He was free to condemn it, for though nearly every water-closet maker made it, it belonged to nobody in particular. He was bound to admit that his own firm made them, for people would have them; but he never allowed one to be made if they could help it. His firm had porcelain enamelled the interior of the container part years ago, and they had made that part in white ware; but, no matter of what material, the pan-closet could never be made a wholesome one. Great care should be taken in selecting self-cleansing water-closets. No closet should be fixed which would not allow a flush of water of two, three, or four gallons to cleanse every part of it which could become fouled by usage. The less surface there was in a closet or trap, the better it could be cleansed, and unless such fittings were thoroughly cleansed after each usage they were sure to become unwholesome. He did not intend to point to any man's make in closets, nor would he bring his own before the meeting, for when self-interest came between a man's eye and any object, it interfered with its true proportion. All that he asked for was, that no watercloset should be fixed which would not allow itself to be thoroughly cleansed, and its trap to be washed out, every time it was used. Passing to the subject of soil-pipes, the lecturer thought that lead was the best material for them, especially for this climate. The only material that at all came into competition with lead for soil-pipes was cast-iron, but he gave lead the preference, because it was more durable, more compact, and more wholesome. He did not pronounce for lead because of any fear that if cast-iron soil-pipes got into general use, it would injure the plumbing trade, for if the plumber could fix lead soil-pipe, which required the greater skill, on account of its "purpose-made" bends and wiped soldered joints, he could certainly fix cast-iron soil-pipe, which required the lesser skill, for the bends and socket branches in the latter case would be cast for him, and ready to hand; while as to the jointings, he would have no difficulty whatever in making them, whether (as in the case of light iron pipe) they were made with spun-yarn and red-lead, or in "cement," or whether the joints were caulked with lead, as they should be when the strength of the iron pipe would admit of it. No cast-iron soil or waste-pipe that would not admit of the joints being made of lead and well caulked should be fixed inside a house. Where plumbers were not skilled in pipe-bending and joint-wiping, it might be preferable to use cast-iron soil-pipe. Cast-iron certainly had the advantage over lead that a carpenter could not drive a nail, bradawl, or gimlet, into it, and when a soil-pipe was fixed inside a house it was worth something to the occupant to know that. Then, again, when the waste-pipes from baths and sinks were taken into a soil-pipe, as in the United States, it was better to use cast-iron, for the action of hot water upon thin lead soil-pipes was very injurious, unless slip-joints were used to allow for expansion and contraction; but, of course, it would not do to fix soil-pipes or waste-pipes with slip-joints inside a house. As to the size of soil-pipes, fifteen or twenty years ago it was common for plumbers to fix (under the direction of a specification) a 6-in. soil-pipe when it had to take the branches of four or five water-closets; and, with many of the architects and builders, as well as the plumbers, of to-day, 5 in. and 4½ in. were the general sizes, even where there was only one water-closet. Now, as it was of the utmost importance that a soil-pipe should be efficiently flushed out with water every time a water-closet upon it was used, it was evident that the smaller the size of the pipe the more efficiently would it be flushed, and as it was not wanted for a coal-shoot or a dust-shaft, the lecturer could not see why it should be so much larger than the outlet-way of the water-closet into it. In private houses, where the water-closets would be used with greater care than in public buildings, he considered a 3½-in. lead soil-pipe quite large enough to take a tier of three water-closets. (He was supposing the soil-pipe to be ventilated at top and bottom, and each trap ventilated as well.) He considered that a 4-in. soil-pipe, when of lead, and made by hydraulic pressure, was large enough to take the branches from several more water-closets, and that a 4½-in. soil-pipe was ample to take a tier of six double closets. He had had 3½-in. lead soil-pipes fixed to take tiers of three water-closets, and he had never known the smallest inconvenience to arise from that arrangement, while the pipes were found to keep cleaner than 4-in. soil-pipes near them. As to the position of soil-pipes, whether they should be outside or inside a building, he gave his voice in favour of outside. There was no danger of the stoppage of a soil-pipe by frost if there were no leaky closet-valves to let the water trickle into the pipe. The effect of frosty weather upon outside soil-pipes was not so damaging as the action of the sun upon them when they were fixed in certain positions, for they were often exposed to the direct rays of the sun for many hours together, the effect being to stretch the pipe between the "tacks," and such stretching would go on from year to year, bending the pipe out of its true vertical line, and perhaps breaking it. Where slip-joints could be used, such lead-pipes (when properly ventilated to prevent the action of gases upon them) would last for centuries; but where the joints must be soldered, the pipes should be placed in an angle or recess where they would be screened from the rays of the summer sun. In conclusion, Mr. Hellyer treated at great length on the ventilation and fixing of soil and waste-pipes, and of their proper disconnexion from drains. He urged that to get good water flushes through waste-pipes from sinks and lavatories, the inlets into such wastes should be as large as, if not rather larger than, the bore of the pipes, so as to get an efficient flush. Where the inlet into a waste-pipe was of smaller bore than the pipe itself, the latter could not possibly be efficiently flushed.

* For reports of the previous lectures see the *Builder*, vol. xl., pp. 651, 711, 775; and current vol., p. 27.

† In a book called "The London Art of Building," published in 1734, plumbers' work is called "plumbery."

‡ "Archæologia," vol. iv., p. 168.

§ Fosbroke's "Encyclopædia of Antiquities," p. 67.

‖ Beckmann's "Inventions," vol. i., pp. 277–281 (1846).

¶ "Letters from Scotland" (1760).

* Aubrey's "Surrey," vol. ii., p. 169.

The Chairman spoke of the value of Mr. Hellyer's lectures as enunciating correct principles. He agreed with almost everything Mr. Hellyer had said, particularly as to the small risk of danger to outside soil-pipes from frost. During the severe winter of 1878-79, in only one case out of a large number of instances in which open soil-pipes had been fixed under his superintendence, did freezing take place, and that was found to be owing to a leaky closet valve. He published the results of his inquiries in the *Builder* at the time.* In conclusion, the chairman announced that, in deference to the desire which had been expressed, that an evening should be set apart for discussion at the conclusion of the course of lectures, the National Health Society would endeavour to make arrangements to that end.

An amusing though somewhat heated discussion arose, led by Mr. Pullen, who seems to have constituted himself the champion of the D-trap. He contended that it was a much better trap than the round-pipe or syphon trap, and, notwithstanding what Mr. Hellyer had said in a previous lecture to the contrary, that it was a self-cleansing trap. Mr. Davies also stood up for the D-trap, remarking that Bramah, so far from discarding it, used it under his valve closet. Mr. Pullen thought fit to question the competency, if not the impartiality, of the judges of the specimens of plumbing sent by working plumbers who have attended Mr. Hellyer's lectures (in competition for the prizes offered) to the International Medical and Sanitary Exhibition at Kensington. Mr. Gosling twitted the lecturer with inconsistency in making and supplying pan-closets when he condemned them, but Mr. Hellyer very fairly retorted by asking what was a man to do when, having taken the contract for the plumbing work and sanitary fittings in a large building, he was told, after a great part of the work was done, that pan-closets must be substituted for those originally intended to be used? He could only comply with the order, though protesting against the want of sanitary knowledge on the part of those who preferred such unwholesome appliances. The meeting broke up in confusion, not to say disorder.

The next and concluding lecture of the course will be delivered on Thursday, the 28th inst.

SANITARY MATTERS IN BIRMINGHAM.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

THE annual meeting of this Society was held in Birmingham last week, commencing on Thursday, the 7th inst., in the Council House. At the business meeting the retiring president, Mr. A. W. Morant, of Leeds, temporarily occupied the chair. Among the members present were:—Messrs. W. S. Till, Birmingham; Lewis Angell, West Ham; J. G. Lynde, Manchester; E. Pritchard, hon. sec. for the Midland district; F. Ashmead, Bristol; J. Allison, Manchester; R. Vawser, Manchester; C. Jones, Ealing; T. Cole, Westminster; T. T. Allen Stratford-on-Avon; H. P. Boulnois, Exeter; J. W. Brown, Aston Manor; G. Cole, Hereford; J. Cook, North Brierley; J. H. Cox, Bradford; B. C. Cross, Dewsbury; A. T. Davis, Solihull; J. T. Eayres, West Bromwich; E. B. Ellice Clark, Hove; J. Gordon, Leicester; R. Hodge, Plymouth; G. Jennings, Rotherham; G. B. Jerram, Walthamstow; J. Lobley, Hanley; H. V. McKie, Carlisle; A. W. Parry, Reading; J. P. Spencer, Tynemouth; G. E. Thomas, Wolverhampton; S. E. Thorold, South Stockton; W. H. White, Oxford; T. W. Bayliss, Redditch; J. Cartwright, Bury; T. Broughton, Warwick; T. Gledhill, Heckmondwike; D. Hildred, Batley; G. W. Sadler, Cheltenham; H. Mitchell, Hyde; J. H. Hall, Liverpool; J. Devis, Oldbury; W. J. Boys, Walsall; W. Blackshaw, Congleton; A. Crier, Lancaster; J. H. Burton, Audenshaw; and J. W. Fereday.

The annual report, which was read by Mr. Cole, stated that twenty-five new members had joined the association this year, three members had died, and the total membership now numbered 204. The members were urged to make every effort to increase the roll of the association.

The report was adopted, and Mr. Morant then vacated the chair, which was taken by Mr. W. S. Till, president-elect for the ensuing year.

Mr. Till, in his presidential address, expressed the hope that during this, the third visit of the association to the borough of Birmingham, some useful information might be gained by the members, and that the objects of the association,—the dissemination amongst the members of that knowledge and practice which fell within the department of an engineer or surveyor engaged in the discharge of his duties under the local and public Acts of Parliament,—might be attained. He had, therefore, prepared a brief description of the borough, together with information as to its streets, night-soil, and sewage works, that he thought would be interesting to the meeting. After giving various statistics as to the former points, Mr. Till explained the sewage arrangements. The Council in 1872, with the view of reducing the difficulties connected with the treatment of the sewage at Saltley, decided upon the introduction of the pan system for collecting night-soil, and at the end of last year there were about 32,000 pails in the borough, estimated to provide for about 250,000 persons. There were about 1,000 water-closets, and the remainder of the population were supplied with the old form of combined privy and ashpit. The cost of the night-soil department in 1880 was 42,996*l.* 17s. 5d., of which 27,196*l.* 2s. 2d. was for collection, &c., of pail contents, and the remainder for the removal of old night-soil; the receipts for the pail contents were 5,702*l.* 3s. 1d., and for old nightsoil 1,992*l.* 8s. 7d., or a nett cost to the borough of 35,296*l.* 5s. 9d. The drainage of the borough was commenced in 1852 by the construction of the Hockley Brook and the River Rea main intercepting sewers, under the superintendence of Mr. Pigott Smith. The total length of sewers now under the care of the Corporation was about 175½ miles. The history of the treatment and disposal of the sewage had until recently been one of difficulty and opposition. In consequence of the proceedings instituted by Sir C. B. Adderley, the Public Works Committee, which had the matter then in hand, presented a report to the Council in June, 1871, recommending the acquisition of from 2,000 to 2,500 acres of land down the Tame Valley; but this being considered too costly, the Corporation, on the recommendation of the Sewerage Committee, promoted a Bill in Parliament, in 1872, for the purchase of 800 acres of the same land near Kingsbury, about eight miles below the present outlet. Owing to the lengthened opposition of the landowners in the neighbourhood, the Bill was thrown out on the third reading. To satisfy the requirements of the neighbourhood, the lime process was at once adopted, and more land was obtained at Saltley, and four additional sets of subsidiary tanks were constructed, to which another large tank had recently been added. Upon the United Drainage Board, which was formed in 1877, now devolved the duty of treating and purifying the sewage delivered by the various constituent authorities at the outlet works. The area of the present Saltley Farm was 272 acres, of which 170 was freehold. The three large tanks and sixteen smaller ones had a capacity of 43,310 cubic yards, or about 7,300,000 gallons. The amount of sludge deposited in the tanks during 1880 was 1,784,000 cubic yards, or about 490 cubic yards per day, and required an area of 53½ acres of land for digging in the same, or rather more than one acre per week. The average dry-weather flow of sewage was about thirteen million gallons per day, the population contributing to that amount being roughly estimated at 450,000, being about 29 gallons per head. A little over 13 tons of lime were used per day, the lime being slacked and ground with water under edge-runners. No nuisance arose from the present method of dealing with the sludge, as was sufficiently proved by the fact that there were nearly 3,000 houses within half a mile of the boundary, and no complaints were made by the inhabitants as to the operations now carried on. Mr. Till concluded his address by assuring the meeting of his anxiety to do all he could for the benefit of the association.

Votes of thanks were accorded to the past president and to Mr. Till for his address.

Several amendments of the rules were discussed. It was resolved to limit membership to the chief officers of corporations and sanitary authorities, and that members who after 1881 ceased to hold any public appointment should be eligible for re-election, but disqualified from holding any office under the association.

The members then visited and inspected the outfall sewage works and sewage farm of the Birmingham Tame and Rea District Drainage Board at Saltley, being met by Alderman Avery (Chairman of the Board), who accompanied the party over the works. The intercepting works in Montague-street were subsequently inspected.

The proceedings of the morning sitting on Friday, the 8th, were opened with a discussion as to the works of the Birmingham Corporation visited on the previous day.

Mr. J. Lemon (Southampton) said he must enter his protest against what he considered one of the most disgraceful exhibitions of sanitary work he had seen. He referred to the intercepting works at Montague-street. He wanted to know why there should be one system for the rich and another for the poor, and he hoped the Corporation would see their present folly, and would at no distant date altogether remove that Montague-street abomination. The present system of the Corporation was most insanitary and expensive. It meant that out of the population of Birmingham, 300,000 persons were using the pail system, and about 100,000 were using water-closets. Judging by the mileage of sewers, he supposed the town was tolerably well drained, and why should they not, therefore, take away the excreta at the time the slops were removed? No larger area was required than to take away the slops only, and the objection on the ground of expense was absurd, and required no answer. The only advantage alleged to be possessed by the system in Birmingham was that the excreta was got rid of at the cut-fall, but he pointed out that they did not evade the cost of removal, for the Corporation paid 35,000*l.* per annum for this. The system of sewers existing in the town was fully capable of removing by water-carriage the whole of the excreta of the borough with more efficiency and less nuisance. The present mode was likely to spread disease, and was, therefore, revolting to every sanitarian. He was at loss to know why the Corporation carried it on, and he felt it his duty to call upon the members to speak openly and fearlessly against one of the most abominable systems in this country.

Mr. Gledhill (Heckmondwike), speaking more particularly with regard to the disinfection of material collected, said he should be very sorry to recommend his Board to follow the example of Birmingham.

Mr. E. B. Ellice Clark (Hove) similarly condemned the system of Birmingham, though he admitted it had obtained its greatest possible advantages in that town. In Liverpool and other large towns the water-carriage system was carried out in its entirety. This was proof that the system could be used by the poor people anywhere. It was difficult to understand why the pail system was being continued. They could hardly imagine it was the pet hobby of an individual, but it was extraordinary that year after year should pass by, and the system should be developing itself all over the North of England, without some statistics as to its superiority over water-carriage.

Mr. J. Lobley (Hanley) urged that the cost of the removal of the pails was money entirely thrown away.

Mr. C. Jones (Ealing), general hon. sec., followed on similar lines, expressing his regret they had heard no defence of the pail system. He confessed the state of things existing in Birmingham was utterly inexplicable to him. Remembering that the system was conducted by gentlemen of position, influence, and scientific knowledge, it staggered him to find how they differed with him upon a question of so much propriety, and he used this word with the fullest meaning. He must, in common with his professional brethren, put his veto on the Association in any way, directly or indirectly, supporting a system which they regarded as so crude, not to say rude, immoral, and bad. Though carried out in the best possible way, the system was still bad in the fullest sense of the word.

Mr. Lewis Angell (London) regarded the pail system of Birmingham as thoroughly degrading and demoralising in every possible way, affording a most disgusting occupation for a number of people, and an admirable system, even if carried out as they saw it on the previous day, for disseminating disease in all directions.

Mr. E. Pritchard (secretary of the Midland Counties District) expressed his disapproval of the system of interception and pan removal.

Mr. J. G. Lynde (Manchester) and Mr. J. Gordon (Leicester) having continued the discussion,

Mr. R. F. Martineau, who was present as a visitor, said on behalf of the committee that he was prepared to defend the pail system tooth

* *Builder*, vol. xxxvii. (1879), p. 239.

and nail. The members of the Association must recollect the circumstances of Birmingham under which the pail system was adopted. When the enormous population of Birmingham and its rapid growth were considered, he thought the engineers present would recognise the immense cost that would have been necessary to obtain land enough to treat properly the whole of the sewage. With reference to the water-closet system, he supposed it must be a matter of the greatest possible difficulty, if not one of impossibility, for the people in the poorer portions of the town to keep the water-closets in such order that smells should not enter the house. How defects could be possibly attended to where such carelessness and ignorance existed, was entirely a mystery to him. Replying to the accusations as to the dissemination of disease by means of the collection of miscellaneous refuse, Mr. Martineau quoted numerous statistics showing the improvement in the death-rate of the borough, especially with respect to zymotic diseases.

The discussion then closed, and a vote of thanks was accorded to Alderman Avery and the members of the committee for their kindness and courtesy to the members of the Association on the previous day.

THE SANITARY SUPERVISION OF DWELLINGS.

Mr. Lewis Angell read a paper on "The Sanitary Supervision of Dwellings." He pointed out that the demand for sanitary supervision had recently found expression in the establishment of societies for sanitary inspection on co-operative principles. The fact of the existence of such societies, be they due to philanthropy or stock-jobbing, raised the great question,—Is such sanitary supervision necessary; and, if this be granted, by whom should it be conducted? That supervision was necessary would be admitted by all who had any official experience. Thousands of houses were annually put together in a manner dangerous to the lives of the occupants, and formed a combination of contaminating influences which lower vitality and endanger life. The result is due as much to ignorance as to carelessnessness, a concourse of fortuitous evils rather than a conspiracy, although, he regretted to add, as the result of official experience, that in many instances it was also the result of the most wilful and wicked cupidity. The Local Government Board recently issued a series of model by-laws for buildings, involving very much detail. He would gladly have urged their adoption by his Board (West Ham, Essex) had he not felt there was no chance of their general observance, over a district of 7¼ square miles, with the staff at his disposal. The imposition of building fees was urged for the provision of the necessary staff, but refused to the applicants. To a condition of things such as he described, in houses new and old, were undoubtedly due the lassitude, the illness, and the deaths of thousands, whose inherent power of resistance was unequal to the fight. Having shown that sanitary supervision was needed, he urged that it was equally obvious the work should be a public and an official one, and not undertaken by amateur or stock-jobbing companies, whose philanthropy was confined to shareholders. Unlike the more advanced public opinion in America, where official factory inspection had been extended to tenement houses, the British ratepayer was not sufficiently educated in sanitary principles. He submitted that a more efficient and extended supervision of the sanitary and constructive details of all dwellings was necessary; that such supervision should be conducted by the responsible officers of the Local Sanitary Authority, and not left to private commercial enterprise; and that it was just that fees be imposed on all new buildings to provide the cost of such supervision. He declared, however, that there was more hope in education than in officialism.

Mr. E. B. Ellice Clark (Hove) said great difficulties had to be encountered before an effectual supervision could be exercised throughout the country. The Government standard of what that supervision should be had been by no means reached in all places. It would be impossible in some towns to insist on stringent sanitary provisions, however necessary; but it should be the aim of the municipal surveyor to gradually work up to the standard required. Dealing with what should be supervised, he urged that where the inspection staff is limited, the four cardinal points for supervision should be:—(1) the structure of walls, roofs, foundations, and spouts of new buildings, for securing health and stability and the prevention of fires; (2) sufficiency of space about new buildings to secure a free circulation of air; (3) ventilation and drainage of new buildings; and (4) closing of buildings, or parts of such, when unfit for human habitation, and prohibition of their use. All these points were empowered by the Public Health Act, but if the requirements of modern sanitarians were to be met there should also be subject to supervision and control the height of rooms, thickness of floors, physical conditions of the site as to floods, whether from sewers or watercourses, works necessary to be carried out in the distribution of water for dietetic purposes, and many other matters necessary to place a house in a good sanitary condition. Supervision, to be of any value, must be exact and impartial. If coercive laws were to be carried out, no discretionary power should be left in the hands of local authorities or officials, such discretion being open to serious objections. As to the probability of the detailed model by-laws being stringently enforced on the community, Mr. Ellice Clark said they might fairly assume a higher state of health, morality, and civilisation, but they must, in exercising something akin to parental control, take care that individual responsibility was not removed from the shoulders of the builders and workpeople to that of the officials. Individual responsibility brought self-reliance, and whatever restrictions were placed on buildings, or whatever supervision was exercised, it must always be borne in mind that the condition of a building is the responsibility of the builder.

Mr. J. G. Lynde (Manchester) stated that supervision, in which was included most of the points recommended by Mr. Angell, had been in force in Manchester for several years past. A certificate was given by the City Surveyor to the effect that the by-laws had been complied with before a house could be occupied. This was done without any cost to the builders, and he thought the system of fees objectionable.

Mr. Ashmead (Bristol) said that by virtue of a special Act, supervision had been increased in Bristol for many years, a special charge being made to the builders for the certificate that the conditions had been complied with.

A paper was also read by Mr. R. Vawser on "Rivers Conservancy." He expressed a belief that the present Bill for the improvement of rivers and prevention of floods is drawn with due regard to all existing and vested interests, and contains all the essential elements of a most useful measure, and as such deserves the earnest support of sanitary authorities.

On Saturday the members of the Association paid a visit to the Birmingham gasworks.

THE CORINTH CANAL.

THE concession granted to M. De Lesseps and General Türr to cut a canal through the Isthmus of Corinth has recalled the fact that this is not the first time the project has been started. The *Hora* of Athens, in an historical retrospect of former attempts, points out that the first recorded instance of the idea being seriously taken up dates back nearly 2,500 years ago. According to Diogenes Laërtius, the Tyrant Periander of Corinth, about the year 625 B.C., made some practical preparations with a view to digging a canal across the Isthmus. The scheme, however, came to nothing. At a subsequent period the same plan, according to Strabo, was revived by Demetrius Poliorcetes. He was, however, deterred from attempting its execution by the reports of his engineers who declared that the waters of the Gulf of Corinth itself stood at so much higher a level than those of the Saronic Gulf on the other side of the Isthmus that their connexion by means of the proposed canal would inevitably overwhelm and destroy Ægina and the adjacent islands. This instance of the ignorance prevailing in ancient times will appear all the more pardonable when it is remembered that similar fears for a long time contributed in recent days to discourage the attempt to pierce the Isthmuses of Suez and Panama. The next to take up the Isthmus of Corinth Canal scheme was no less a personage than Julius Cæsar. That Roman general instructed an engineer, Anienus by name, to survey the ground, and, if practicable, to carry out the work. The death of Cæsar, however, occurred before a sod was turned, and nearly a century elapsed before the plan was again revived. Suetonius tells us that the Emperor Caligula contemplated solving the problem, and actually despatched a centurion to study the *terrain* and make everything ready for beginning the excavations. Caligula, however, passed away, and nothing further was done in his reign.

It was under the Emperor Nero that the first actual digging operations were commenced. That sovereign, half genius, half madman, himself proceeded to the isthmus, and set 6,000 Jewish slaves, together with numerous gangs of convicts, to work in making the canal under his own personal supervision. The operations, however, had not been long commenced before they had to be entirely suspended owing to the formidable insurrection under Julius Vindex. The work was never resumed. The traces of the excavations commenced by Nero, nevertheless, are still visible to this day, more especially near the Diolkos. Afterwards Herodes Attious, the benefactor of Athens, designed taking up the work left undone by Nero; but in the end he was afraid, as a private gentleman, to undertake a work of such magnitude,—a work which even emperors had tried and failed at. Thus all the attempts made in ancient times came practically to nothing. The only result was to confirm the popular belief that the project was not only impracticable, but was an impiety against the gods. Tacitus speaks of those who "would pierce the isthmus with a navigable channel," as "hankering after things unheard of or past belief." The failure of all attempts was popularly attributed to the displeasure of the gods, "as is plainly evident from the result," says the historian just cited. Dio Cassius reports that at the time of Nero's attempt there were numerous terrible signs and portents, showing the disapproval of the deities. It was a widespread superstition that to endeavour to change the relations between the land and the sea as presented by Nature was nothing less than an impious attempt to disobey and thwart the will of the gods. In reference to the design once entertained by the people of Cnidus to cut through their peninsula, Herodotus reports the following as the reply given by the oracle to their inquiry on the subject: "Neither fortify nor pierce through the isthmus, for Zeus would have made it an island if he had so willed."

WORKS IN EDINBURGH.

IN order to expedite the restoration of the remainder of St. Giles's Cathedral, Dr. William Chambers (at whose cost the restoration is being carried out) has secured an iron church for the temporary use of the congregation at present occupying the nave, until such time as their new church at Meadow-place is built. The erection of the temporary church is being rapidly proceeded with, upon a site granted by the Town Council, at the east end of the Links, so that the restoration of the nave and north transept of the cathedral may not be delayed. The restoration has been entrusted to Mr. Hay, architect, who carried out the works in the choir and south transept, and a similar course is to be adopted with the remainder as was pursued in regard to these portions. The pews, galleries, and other interior fittings are to be removed, the plaster taken from the walls, and the masonry cleaned and re-dressed, and defects supplied where necessary. The walls which divide the north transept from the nave, choir, and south transept will, as a matter of course, be pulled down, so that an unobstructed view of the whole area may be obtained. The low plaster ceiling under the crossing will also disappear, and a new ceiling of uniform height with those of the nave and choir be substituted. The doors at the west end and north transept, which were the work of Mr. Burn, are to be superseded by others of new and appropriate design. The western door is to be deeply recessed, and richly moulded and carved, and divided into two by a stone pier. The northern door is to be similarly treated, and an inner porch formed by the erection of a stone screen across the whole width of the transept. The pillars and arches which support the tower are perfectly secure, but a good deal will require to be done to them in the way of restoration of detail. The mural monuments in the north transept are to be removed to suitable positions in the south aisle of the nave.

In a limited competition for a new Free Church, to be erected in Easter-road, immediately adjoining the Episcopal Chapel designed by Mr. H. J. Blanc, the designs by Mr. Charles S.

Johnston, architect, have been chosen. In this instance the committee were guided by the advice of an expert, the favourite design, we understand, having been put aside as being likely to cost considerably more than the stipulated sum. The church and adjuncts have a frontage of 70 ft., and an average depth of 115 ft. The interior of the church, consisting of nave and isles, measures 73 ft. by 47 ft., and, including the accommodation provided in a gallery at the west end, there are sittings for 750 persons. The east end is apsidal, and groined in wood. The arcades separating the nave from the aisles are formed by iron columns supporting timber arches, the spandrels of which are pierced by circles and cinquefoils; and over the arcades there is a timber clearstory, with cusp-headed windows arranged in groups of three. The west elevation consists of three parts,—central gable, tower and spire, and turret containing staircase to gallery. In the central gable there is a three-light window with geometrical tracery, beneath which is the doorway, flanked by two small windows on each side. The tower and spire terminate at a height of 85 ft., and the turret containing the stair to the gallery is finished by a gabled roof, and is separated from the main gable by a buttress. The side walls are without buttresses, and rise to a height of 16 ft. above the floor level; at the west end they are pierced by double and triple light windows above and below the gallery level, the other windows being narrow splayed and pointed openings. The estimated cost of the buildings, including a hall, 36 ft. by 26 ft., session-house, 19 ft. by 15 ft., vestry, 12 ft. by 10 ft., and other adjuncts, is 3,500*l.* The church is to be dedicated to the memory of the late popular and eloquent Dr. Thomas Guthrie.

The plans for the new portion of the Calton Gaol, prepared by Major-General Collinson, have been approved of by the Home Secretary, and the Prison Commissioners have been authorised to proceed with the construction of the buildings. The style adopted is Castellated, in unison with the existing buildings. The new works will consist of two divisions. In the one accommodation will be provided for 52 male and 87 female prisoners, and in the other for 162 male prisoners. The heating apparatus, kitchen, bakery, &c., will be placed between these two blocks. The court-yard will be increased by throwing back the boundary-wall to within 10 ft. of the outer iron railing, and a new entrance-porch will be formed, and accommodation provided for the female officials. The present west division will be altered by throwing two cells into one, by which means the Government requirement as to space will be amply met. This portion will be occupied by female prisoners, and not by males, as hitherto.

The municipal authorities having called upon sculptors to submit designs for statues and statuettes for the vacant niches in the Scott Monument, upwards of sixty competitors submitted designs. The figures are to be executed in freestone, and it has been resolved to give commissions for eight large statues, at a cost of 52*l.* 10*s.* each, and twenty-four small ones, at 25*l.* each. The following are the sculptors selected and the subjects entrusted to them:—For the large niches,—Balfour of Burleigh and the Knight Templar, W. B. Rhind; Rob Roy and Ivanhoe, John Rhind. For the small niches,—Peter Peebles and Montrose, D. W. Hutchison; Julia Mannering, George Webster; Davie Deans, Effie Deans, and Lady Avenel, J. S. Barnet; Percy Shafton, Clark Stanton; the Dougald Crater, Charles Macbride; Weyland Smith, J. S. Gibson; Gurth, W. Sheriffs; Queen Elizabeth, W. Walker; the Abbess and Caleb Balderstone, W. G. Stevenson; Rose Bradwarden, D. Buchanan; Dirk Hatteraick and Claverhouse, W. B. Rhind; Dugald Dalgetty, Ravenswood, Lady Rowena, Ritchie Moniplies, and Lucy Ashton, J. Rhind; Constance, Fraser Tytler. To Mr. Brodie, R.S.A., has been entrusted the characters of Helen Macgregor and Cromwell, for large niches; and Madge Wildfire for a small one; and to Mr. Hutchinson, R.S.A., the characters of John Knox and Charles I. for the large niches, and George Buchanan for a small one. The figures are to be delivered by the 1st of March next.

The tower of the Corn Exchange, in the Grassmarket, is to be furnished with a clock, at the cost of 90*l.*, the hours to be struck upon the bell now in the tower. The dials are to be illuminated by a self-lighting machine, adapted to suit the variation in the length of the days and nights.

It has been resolved by the Plans and Works Committee of the Town Council to make a charge of 2*s.* 6*d.* per annum upon each pole sanctioned for the erection of telephone wires. Reference was made to the probable danger incurred by such wires overhead, but no resolution was come to on the subject.

The Municipality have secured a lease of seventeen acres of ground at Merchiston for a period of five years, at a rental of 10*l.* per acre, to be used as a public park. The ground is in the neighbourhood of Fountainbridge and Dalry, where a large number of dwellings for the working-classes have been erected of late years. Much care and taste has been displayed in the planting-out of the public gardens, and the rich masses of foliage upon the trees has at present a very fine effect. Edinburgh always appears to best advantage at this season of the year. Albeit, the late east winds have been more trying than usual to feeble constitutions.

A committee of gentlemen connected with the district of Morningside have acquired the United Presbyterian Church there, which is to be vacated in the month of October next by the congregation, who remove to the large and handsome church over the way, designed by Mr. David Robertson. The church is to be converted into a literary institute, comprising a lecture-hall, library, reading-room, &c. The purchase-price of the church was 2,000*l.*, and a further sum of 2,000*l.* is to be expended upon the transformation. To Messrs. Thornton Shiells & Thomson this task has been entrusted, and, looking to the limited amount of the capital at their disposal, it seems a somewhat difficult one. The exterior walls of the church are to be retained as they are, and a floor is to be inserted half-way up, thus converting the building into two flats, the upper one being retained as the lecture-room, and the lower appropriated to the other purposes of the institute. What strikes one at first sight is the fact that a less amount of air and space seems to be considered necessary for an audience listening to a lecture on scientific than for one on religious subjects. The church is by no means of unusual height, and we do not anticipate a satisfactory result, either without or within, from the cheese-paring policy adopted.

The building of the new Conservative Club in Prince's-street has been postponed, owing to a dispute as to the ownership of a lane in rear of the site.

There is a large and very handsome church in course of erection at Tynecastle. It is for a congregation in connexion with the Establishment, at present worshipping in an iron church in the immediate vicinity. Mr. Honeyman, of Glasgow, is the architect.

We learn that another church is contemplated by the Church of Scotland for the district of Inverleith and Goldenacre. These new churches are consequent upon the increase of population in the respective districts. The number of churches in the suburbs of Edinburgh will soon be subject of remark. There seems to be no want of zeal in church-building, whatever may be said by those who should know best as to the decay of true piety.

RESTORATIONS IN ITALY.

IT is well known that in consequence of the loud remonstrances from without, as well as from those at home who are really interested in the restoration of ancient monuments in Italy, a Commission was formed last winter with De Sanctis, the then Minister of Public Instruction, at the head, and who is now replaced by Bacelli, to watch over the restorations undertaken. The work had previously been entrusted to civil engineers, men well versed, no doubt, in the mechanical work of their profession, but not necessarily men of artistic perceptions. Many travellers, having for their goal Florence or Rome, pass the interesting town of Pistoia, and miss seeing the many objects of great interest it contains,—its grand old Duomo, with endless bits of Mediæval architecture and sculpture, and its curious old pulpit on the exterior of the building, and the grandly sculptured pulpits in the churches of San Andrea and San Bartolommeo-in-Pantano, besides the picturesque town-hall, &c.

The hospital of Del Ceppo was founded about 1277. The cornice of the façade is adorned by one of the most magnificent works of Della Robbia. This work was added about 1525, and is now about to undergo restoration. The Pistoians, wishing to record the works of charity performed by their citizen-bishop, Andrea Franchi, of the Dominican order of priesthood, had this splendid ornament added to their hospital. It is one of the most splendid works of glazed terra-cotta existing, of the old Luca di Simone della Robbia work. Which of the Della Robbias was the author no existing document relates. It is generally attributed to Andrea, grandson of the old Luca, the same who, up to 1505, superintended the work of the ornaments in front of the gallery of the cathedral. He may have been aided in the work by his three sons, Luca, Giovanni, and Girolamo, since the receipt of certain sums is found in the archives of the hospital signed by Giovanni, who had paid the same to Andrea di Marchi in 1525, the time of the making of the ornament. The work represents the seven acts of charity,—clothing the naked, visiting the imprisoned, giving to eat and drink to the needy, &c. Each compartment is divided by pilasters of deep blue colour, with ornaments in high relief in white. The figures are perfectly modelled, in the highest possible relief, full of beauty and grace and touching expression. At each point where the arches that support the gallery join, are three medallions, representing the Annunciation, the coronation of the virgin, and the visit of St. Elizabeth, each surrounded by frameworks of fruit and flowers. Four figures representing Faith, Prudence, Hope, and Charity, are between the ornaments of the loggia or gallery. The arms of the Medici, of the city, and of the hospital, are discovered among the adornments. This great work of art is one of which any city may be justly proud, and it is devoutly to be hoped that the Minister Bacelli will be happy in the selection of the persons destined to superintend its restoration.

THE MINING DEATH-RATE.

THE reports of the Inspector of Mines for the past year show that the heavy mining fatalities have caused marked differences in the death-rate of the coal-yielding districts. In 1879, South Durham district had the loss of one life to every 885 persons employed at or in the mines, whilst the volume just issued shows that one life was lost for every 220 persons employed last year. Northumberland, North and East Lancashire, Derbyshire, Yorkshire, South Staffordshire, Monmouth, Scotland, and South Wales have in the year gained in safety in proportion to the number of miners employed; but in North Staffordshire, Cleveland, and one or two other districts, there has been slightly more loss of life in proportion to the persons employed. The general results are, that whilst in 1879 there were 490 persons employed in and about the coal mines of the kingdom for every life lost, last year there were 368 persons only employed for every life lost. As to the tonnage results, in 1879 there were extracted 149,400 tons of mineral for every life lost, last year 122,509 tons only being extracted for each life, the serious colliery explosions at Seaham and in the Welsh districts having chiefly caused the change. In consequence of these losses, there is for the past year one of the heaviest reports of mining mortality that has been given since the introduction of the system of inspection. Not less than 1,318 lives were lost by accident in the mines registered under the Coal Mines Act, the number for the previous year being 973. The great bulk of the increase is to be found in the fact that the lives lost by explosions of fire-damp have risen from 184 in the year 1879 to 499 last year,—the Seaham explosion contributing 164 to that number. This and other heavy losses have probably contributed to bring forward from the mine inspectors in their reports a number of opinions that will in all probability have weight in future legislation. Mr. Wynn condemns blasting in fiery mines. He says that "no care or attention which can be bestowed upon the ventilation of a fiery mine can make the use of powder at all times safe." Mr. Alexander states that the use of loose gunpowder is responsible for over 7 per cent. of the accidents that took place in the past year. Mr. Wales expresses the opinion that "all the South Wales steam coals should be worked exclusively with locked safety-lamps, and shot firing strictly prohibited." Other inspectors join in this expression of opinion, and it may be said to be substantially that of the mining inspectors. One of these gentlemen states that he has "warned the public and the authorities of this terrible danger" long and often, and that

thus the responsibility for the continuance of the system of shot-firing "rests with others." It is evident that the mining inspectors are now convinced of the folly of this most "wasteful system of coal winning," and that it rests with the public to say how long it shall continue, and how long other efforts to minimise the loss of life in coal winning shall be in some years rendered of little avail. For years there has been a gradual descent in the loss of life in the coal mines; but it has been checked by the growth of the number of lives lost by falls of the roof and sides of parts of the pit, and especially by the exceptional mortality in several years by the heavy fatalities that have occurred in different parts of the country by explosions of fire-damp, and by allied or following causes. When there is a consensus of opinion against a practice which is supposed to very materially contribute to that loss of life from that one cause, it is worth the consideration of the public whether a stop should not be put to it, and whether that "responsibility" resting on the public should not be dealt with and removed.

ORNAMENTAL AND DECORATIVE ART EXHIBITION, LISBON.

AN exhibition is to be opened in the National Museum of Fine Arts in Lisbon, of the Spanish and Portuguese ornamental and decorative arts, practised from the remotest period of antiquity to the end of the eighteenth century in those countries. In addition to the articles exhibited in the South Kensington Museum, of Spanish and Portuguese origin, there will also be exhibited others possessing the highest artistic value, belonging to various corporate bodies and private persons, which, on account of the danger of breakage and injury in their transmission to London, could not be exhibited in the South Kensington exhibition. Various other objects, which were collected by the several committees for the purpose of transmission to London, will also be exhibited on this occasion. The exhibition will also admit any articles of art existing in Portugal and Spain, without reference to their origin, provided they are works of a period anterior to the commencement of the present century. The exhibition will be opened in November next, and it will continue to the end of January, 1882. The President of the Commission of this exhibition is Prince D. Fernando II., father of the present king of Portugal, and the members who compose the Commission consist of the highest nobility and men of letters in Portugal.

PRIZES: INSTITUTION OF CIVIL ENGINEERS.

FOR some of the communications presented during the recent session, the Council of this incorporated society have just awarded premiums and prizes, arising out of various trust funds, including the following:—

For Papers read at the Ordinary Meetings.

1. George Stephenson medals and Telford premiums to Thomas Forster Brown and George Frederick Adams, MM. Inst. C.E., for their paper on, "Deep Winning of Coal in South Wales."
2. A Watt medal and a Telford premium to John Isaac Thorneycroft, M. Inst. C.E., for his paper on "Torpedo Boats and Light Yachts for High-speed Steam Navigation."
3. A Telford medal and a Telford premium to Theophilus Seyrig, M. Inst. C.E., for his paper on "Different Modes of Erecting Iron Bridges."
4. A Telford medal and a Telford premium to Max am Ende, Assoc. M. Inst. C.E., for his paper on "The Weight and Limiting Dimensions of Girder Bridges."
5. A George Stephenson medal and a Telford premium to Benjamin Baker, M. Inst. C.E., for his paper on "The Actual Lateral Pressure of Earthwork."
6. A Telford premium to Richard Henry Brunton, M. Inst. C.E., for his paper on "The Production of Paraffin and Paraffin Oils."
7. A Telford premium to Charles Colson, Assoc. M. Inst. C.E., for his Paper on "Portsmouth Dockyard Extension Works."
8. A Telford premium to Christian Hendrick Meyer, Assoc. M. Inst. C.E., for his Paper on the "Temporary Works and Plant at the Portsmouth Dockyard Extension."
9. A Telford premium to Benjamin Walker, M. Inst. C.E., for his Paper on "Machinery for Steel-making by the Bessemer and the Siemens processes."
10. The Manby premium to Joseph Prime Maxwell, Assoc. M. Inst. C.E., for his Paper on "New Zealand Government Railways."

Christmas and New Year's Cards.—A great competition in designs for such cards has been induced by Messrs. Hildesheimer & Co., and the specimens submitted are now on view at the Egyptian Hall, Piccadilly.

THE GREAT EASTERN HOTEL.

THE Great Eastern Railway Company will, in a short time, be in possession of one of the largest and most costly hotels in the metropolis. It is being erected immediately adjoining the approaches to the Liverpool-street Station, and will have a frontage to Liverpool-street of 280 ft., extending from the general offices of the Company to Bishopsgate-street, having a handsome elevation to that thoroughfare of 50 ft. in length. The preliminary excavations and the construction of the building up to the ground-line at the east end of Liverpool-street and Bishopsgate-street have formed a heavy portion of the work. In this portion of the structure there are a basement and a sub-basement, carried to a depth of 30 ft. below the pavement level. The spacious vaults for storage purposes, together with an immense kitchen, and numerous other apartments in connexion with the culinary department of the hotel, have been constructed, the walls of all these several apartments being faced with white enamelled brick. The sub-basement has a concrete floor 6 ft. in thickness, whilst the floor above it is fire-proof. In the construction of this underground portion of the hotel, upwards of a million of bricks have been used, and the superstructure is now making rapid progress. The two elevations of the hotel will be entirely in Portland and Corsehill stone. The Bishopsgate-street frontage will have a commanding appearance, containing five lofty stories above the ground-floor. There will also be a return frontage in Liverpool-street of almost equal length with the Bishopsgate-street elevation, and of uniform design. In consequence of rights of ancient lights interfering as respects some buildings at the rear, a portion of the Liverpool-street frontage will not be carried up beyond a height of between 60 ft. and 70 ft. From Liverpool-street the hotel will be carried in the direction of the station area to a depth of 114 ft., being built upon strong iron girders extending the entire width of the station itself, which the windows at the rear of the hotel will overlook. All the girders which support the superstructure will be supported by iron columns 2 ft. 6 in. in diameter, and massive piers in blue Staffordshire brick, with iron stanchions. There will be a balcony extending entirely across the station frontage of the hotel, which will be approached from the station area by two staircases from the arrival and departure platforms respectively. There will also be lifts for passengers' luggage to and from the hotel, both on the arrival and departure platforms. In about the centre of the Liverpool-street frontage an ornamental archway, 25 ft. in width, having massive carved and moulded piers in Portland stone, will lead down to a covered cab-rank on the railway level. The principal entrance to the hotel will be from the Liverpool-street frontage, the ground-floor portion of which will consist of shops, but there will likewise be another entrance in Bishopsgate-street.

The architect of the hotel is Mr. C. E. Barry, and the contractors are Messrs. Bangs & Co. Mr. W. T. Vale is clerk of the works. The iron girders across and over the line, on which the hotel will rest, were erected under the immediate superintendence of Mr. Alfred Langley, the company's engineer-in-chief.

THE NEW THEATRE IN NORTHUMBERLAND AVENUE.

AFTER remaining in abeyance for several months past, the works at Mr. Sefton Parry's new theatre in Northumberland-avenue have this week been resumed, and the building will now be actively proceeded with, and, as we are informed, will be opened before the close of the year. It may be remembered that the stoppage of the works at the theatre was owing to the action taken by the directors of the South-Eastern Railway Company, who during the time the foundations of the theatre were in course of construction, entered into negotiations with Mr. Sefton Parry for the purchase of his interest in the site, with the view of obtaining powers for the extension of their Charing-cross station in that direction. It was understood that these negotiations resulted in the company buying Mr. Sefton Parry out, but prior to their being ratified, the railway company took a course hostile to Mr. Parry, by applying to the Master of the Rolls for an injunction against his proceeding with the erection of the theatre on the ground that the construction of the foundations adjoining the railway station was undermining the west wall of that structure. The injunction was refused, with costs against the railway company, and as the company have since declined to complete the purchase bargain originally entered into, the erection of the theatre as at first intended follows. It is to have elevations to Northumberland-avenue and the Embankment, the latter being circular in form.

Messrs. Fowler & Hill are the architects of the theatre; and Messrs. Kirk & Randall the contractors.

ARCHITECTURAL SCHOOL, ROYAL ACADEMY.

THE following were admitted, July, 1881, to the Architectural School:—

To Upper School.—F. B. Bare, W. Bucknall, J. H. Curry, B. Dickson, E. G. Hardy, W. H. Lethaby, G. H. Saackie.

To Lower School.—G. Blizard, G. C. Horsley, H. H. Kemp, A. Kent, A. Leslie, H. W. K. Martin, H. G. Nixon, H. Read, T. Sims, J. A. Slater, R. E. Smith, C. H. Stock, W. Toogood.

Probationers.—G. W. M. Addison, E. T. Blomfield, W. M. H. Burkitt, F. Dickenson, H. Field, E. A. Jackson, F. Johnson, G. E. T. Laurence, T. Maclaren, G. T. Oakeshott, S. Gambier Parry, F. Landers, A. D. Smith, Kingo Tatsuno, Thomas Ward.

COMPETITIONS.

Corporation Market, Birmingham. — The limited competition for new buildings in connexion with Smithfield Market, St. Martin's-lane, has now been decided. The competing architects were Messrs. Osborn & Reading, Messrs. Bland & Cossins, and Messrs. Martin & Chamberlain. The design submitted by Messrs. Osborn & Reading has been selected.

Forest of Dean Board Schools.—In the competition for Steam Mills Schools, Forest of Dean, Gloucestershire, for 416 children, Joys Green Schools for 274 children, and a separate teacher's residence, the designs of Mr. Alfred Smith have been accepted by the Forest of Dean U.D. School Board for the above works. They have been passed by the Education Department, and are to be proceeded with at once.

PROPOSED TOWN-HALL FOR EASTBOURNE.

AT the last meeting of the Eastbourne Local Board,—

Mr. Schmidt, building surveyor, produced plans for a town-hall at Stock's-bank, to cost about 13,000*l*. One of the principal features is a county court-room, but there are also a board-room and offices. The plan had been submitted to Judge Martineau, who affirmed the same with a few slight alterations.

The question arose whether a portion of the building should be put up first, or the whole work carried out at once. The latter view appeared to be the most general, and on the motion of the Rev. E. E. Crake, it was resolved to invite tenders for the work, and to apply for powers to borrow the additional sum required beyond what the Board has in hand.

A CURIOUS CASE UNDER THE METROPOLITAN BUILDING ACT.

A SOMEWHAT singular case, as illustrating the difficulties arising from rash and ignorant tampering with houses by their tenants, was heard at the Marylebone Police-Court a few days back.

It appeared, from the statement of the district surveyor, Mr. Wallen, that Mr. Dart, of 100, Park-street, Camden Town, had caused an erection or additional story to be built on the flat of the one story addition at the rear of that house, which adjoined another addition also one story high at the rear of No. 101. The district surveyor required that this addition should have a wall on the side next to No. 101, or, in other words, that the party-wall should be carried up above it. This was accordingly done, and the building duly passed. Thereupon the owner or lessee of No. 101 threatened Mr. Dart with legal proceedings for obstruction of light to his rear buildings owing to the new addition at No. 100; and for trespass in raising on the wall which he claimed as his; and Mr. Dart, in the hope of meeting his objection, sent for Mr. Soper, a builder living

close at hand, and desired him to pull down the wall that the district surveyor had required to be raised, and this he accordingly did, without notice to the district surveyor. Then Mr. Dart, wanting an inclosure, put up with his own hands some thin wooden boarding. The district surveyor afterwards discovering the change that had been made, served Mr. Soper with notice to restore the wall, waiving (on Mr. Soper's representation of inadvertence) the penalty for neglect to give notice. A summons was granted, and an order to restore the wall made by the magistrate. Mr. Soper, however, on account of the difficulty of the adjoining owner above referred to, proposed to remove the new erection altogether. But here Mr. Dart found a fresh difficulty in the fact that he had just executed the counterpart of a new lease, under which he was bound to maintain the new erection intact. Mr. Dart, therefore, refused to allow Mr. Soper to enter his premises in order to comply with the magistrates' order, and the latter appealed to the district surveyor, who thereupon commenced proceedings against Mr. Dart for the erection by him of the wooden enclosure. A notice was accordingly served on him to substitute brickwork, and, on failure to comply, a summons was taken out against him. Meantime the action with the adjoining owner came before the Court of Queen's Bench, and is referred to arbitration, and the magistrate adjourned the summons against Mr. Dart pending the decision thereon. Then the accident happened which the regulation, sought to be enforced by the district surveyor, was intended to prevent. A fire occurred at the rear of No. 101, which, owing to the absence of the wall in question, communicated itself to the erection on Mr. Dart's roof, entirely destroying it, and doing considerable damage to the main part of the house, which narrowly escaped destruction.

The adjourned summons against Mr. Dart, and a fresh one taken out by the district surveyor against Mr. Soper for non-compliance with the magistrate's order, was heard on Wednesday, the 22nd ult., when the district surveyor said, as regarded the former, he could hardly proceed—the cause of complaint being destroyed—but suggested that a fine should be inflicted on Mr. Soper for non-compliance with the magistrate's order under the latter summons (which he could recover from Mr. Dart) for the folly and recklessness which had produced the disaster.

Mr. W. M. Miller, solicitor, who appeared for Mr. Dart, pleaded, however, that he was inadequately insured, and would already suffer, whereupon Mr. de Rutzen expressed an opinion that, under all the circumstances, the summons might be withdrawn on payment of costs.

Mr. Dart, however, is still as far from being relieved of the difficulty into which he has got himself as ever. If he does not restore the erection, he forfeits his lease. If he does, the district surveyor immediately requires the raising of the wall, and he is still liable to the proceedings taken against him by the adjoining owner.

The whole should be a warning to shopkeepers and others, who take property on lease, not to tamper with their buildings, as they are so frequently apt to do, without taking proper advice as to the responsibilities they are incurring, or carefully considering the consequences of their actions.

PATENT RECORD.*

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending July 2, 1881.

4,153. R. W. Gossage, Deptford. Adjustable apparatus for regulating the position of doors and windows.

This is applicable to windows of the kind termed "French," that open like doors. A cylinder is screwed to the door, within which is a piston actuated by a spiral spring. A spindle is attached to the piston which passes through the inner end of the cylinder, on the end of which is an adjustable nut. A double-armed lever is hinged to the door-post, and the ends of the arms come to the sides of the cylinder, through which they are connected together by a pin, which is made to act on the piston. The position of the door or window, when partly open, is thus regulated by the adjustable nut. Oct. 13th, 1880. Price 6d.

4,177. E. Taylor, Blackburn. Appliance for fire-grates for consuming smoke, &c.

A perforated plate is placed in the flue above the fire in a diagonal position towards the back of the fire, which, becoming hot, burns the smoke as it passes away from the fire, and increases the heat by intercepting it from going up the flue. Oct. 14, 1880. Price 6d.

4,634. J. Jobson, Derby. Open fireplaces.

The back, bottom, and sides are formed of fire-bricks. Passages are made through these, by which air is led to mix with the smoke and consume it. Nov. 11, 1880. Price 8d.

4,714. J. M. Tall, Dulwich. Concrete buildings.

This uses a combination of slabs and blocks formed of concrete. The slabs are made with an enlargement on two opposite edges, and a groove is formed within them. The blocks also have a groove along two edges. When they are placed in position, a grouting of cement is poured into the groove at the joints and allowed to harden. Nov. 16, 1881. Price 8d.

4,752. J. Holgate, Burnley. Cutting or dressing stone, &c.

The stone is placed on a travelling table, and cylinders, which revolve in the same direction, are used to carry different cutters, whereby the stone is cut and dressed in one operation. The cylinders are so geared that they can be raised or lowered together or separately, and the table is made to travel at whatever speed is required. Nov. 18, 1880. Price 6d.

4,761. H. Thompson, Islington. Domestic grates or stoves.

The main portion of the grate being formed in the usual manner, the front bars are made to move vertically in grooves at the sides. The bottom bar has a slot, through which is passed a flat plate, when the whole of the bars and the plate are raised, leaving a space at the bottom of the fire in which fresh fuel may be placed, when the plate is withdrawn, and the bars allowed to drop into their normal positions. Nov. 18, 1880. Price 6d.

4,832. E. Young, Steyning. Wooden pavements.

To prevent horses slipping upon wooden pavements, a nail or spike, on which is a washer, is driven into the upper surface of each block. The washer prevents the nail being driven into the wood, and the head of the nail affords a firm foothold to horses. Nov. 23, 1881. Price 4d.

4,845. W. R. Lake, Southampton Buildings. Furnace or fireplaces.

Air pipes are provided, having their inlet openings in the outer air, which are led into the flue or chimney to receive the heat passing up, and are then coiled round the fire and open into the fire chamber by long narrow mouths, arranged at an angle to the direction of the draught, whereby the smoke and gases are consumed. Several different arrangements for the pipes are shown. (Com. by J. Wolstenholme, Buffalo, U.S.A.) Nov. 22, 1880. Price 6d.

4,853. J. Lovegrove, Lower Clapton. Sewer and drain pipes.

An overflow passage is formed along on the top of the drain, with which it is in communication by small openings. When an obstruction takes place in the pipe, the water will escape upwards into the overflow passage, and after passing the obstruction will flow downwards into the pipe and pass away. In convenient positions along the drain, shafts, partly vertical and partly curved, are placed, divided by two divisions, into three spaces. The two outer divisions are connected by curved pipes to the drain, so that bamboo cane rods can be passed down. The centre space is vertical, and can be used for examination of the drain, &c. Syphon-traps are used for the drain inlets. Nov. 23, 1880. Price 6d.

4,896. H. Hunt, Newington. Combined blower and fire-guard.

A frame is made to fit the fireplace, hinged as required, and transparent mica or talc is inserted therein. Adjustable slides are provided, so that it may be withdrawn a little and act as a fire-guard. (*Pro. pro.*) Nov. 25, 1880. Price 2d

4,916. W. H. Settle, Horncastle. Manufacture of mosaic or ornamental slabs, tiles, tablets, &c.

A number of glass beads or other suitable materials are secured together by wire, and bedded in a cement backing, which forms the body of the slab, &c. (*Pro. pro.*) Nov. 25, 1880. Price 2d.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C. It is not the fault of Messrs. Hart & Co. that this list has fallen behind-hand.

SANITARY PLUMBING: GULLIES.

SIR,—I have read with great interest Mr. Hellyer's lectures on "Sanitary Plumbing," as reported in the *Builder*, more especially the one on "Traps and Trap-Ventilation," and I fully agree with him in most that he has hitherto said; but I cannot follow him in all that he says respecting the disconnexion of sinks, waste-pipes, &c., and in his sweeping condemnation of the gullies now so generally used for that purpose. Besides, in condemning the Mansergh trap (which, by-the-by, is liked by some eminent sanitarians), Mr. Hellyer condemns all traps or gullies that are not what he terms self-cleansing; but as they are recommended for the disconnexion of sinks, &c., by the great majority of surveyors and engineers, and as they are also recommended in the "Model By-laws" recently issued by the Local Government Board, and as I have seen some thousands fixed which answer their purpose in every particular, I cannot allow Mr. Hellyer's individual opinion to outweigh my own experience and the opinion of so many eminent and practical sanitary engineers. Of course, the construction of a gully is such that there *must* be a certain space where sediment can subside, and there is no doubt that this deposit is not removed so often as it should be from ordinary gullies, but there are some with a movable bottom, which reduces this evil to a minimum; but I am of opinion that it is not an unmixed evil, for there is always a certain quantity of grease and soapy matters from a sink, which, although they will not subside by themselves, are dragged down to the bottom by silth and heavier matters. Mr. Hellyer admits that for yard *detritus* the gully is the proper thing, but when a trap with an open grid is placed outside a house to receive the discharge from the sinks, it more often than not has to serve as a yard gully also.

With respect to self-cleansing traps. I have never yet had the pleasure of seeing one that would really be self-cleansing placed between the sink and the sewer. I can understand that a syphon-trap, with a slow bend, properly fixed, would probably be self-cleansing if the discharge into it could be always direct and in fair quantities, so as to flush it at every discharge, but it is not so in practice. Sometimes there is only a little trickling down, very seldom a flush; the consequence is that there is soon a deposit composed of silth and grease which no flushing you can give it from the sink or grid can remove. Why, even a drain itself, laid properly and at an even gradient, and without the intervention of a trap or syphon, if that gradient is slow, and there is any quantity of fat, will often choke sooner or later. I have seen scores of pipes and syphons taken up choked with grease and silth where there has been no fault in laying them. At a meeting of the Royal Institute of British Architects, some time in 1877, the question of grease in drains was thoroughly discussed, and Field's flush tank and Dean's gully were recommended by some speakers. I consider Field's flush tank to be the simplest and most perfect thing to use where there is a quantity of grease, and Dean's trap possesses great advantages over the ordinary gully. There are numerous other gullies also which I do not think should be so thoroughly condemned without the chance of a reply, and I think with some of your correspondents that it would be very satisfactory if some arrangements could be made for a general discussion upon the whole of the papers. CHRYSTABEL.

REFUSAL TO PAY ON ARCHITECT'S CERTIFICATE.

LOVELL *v.* CHAMBERS.

In the Queen's Bench Division of the High Court of Justice, Westminster, a few days since, the case of Lovell *v.* Chambers came before Mr. Justice Lindley and a special jury. It was an action to recover the balance of an account under a contract.

Mr. Butt, Q.C., in opening the case of the plaintiff, said his client was a builder and contractor carrying on business at Great Marlow, in the county of Buckingham, and the defendant was a barrister residing at the same place. In 1877 the defendant engaged the plaintiff to pull down an old house known as Beechwood, at Great Marlow, and build him a new one. The claim of the plaintiff was for a balance of money due under the contract, and for extra work amounting to 1,171*l.* 17*s.* 10*d.* The total sum due under the contract, including the value of old materials, was 4,650*l.*, and, under the contract it was agreed that the builder's claim should be assessed from time to time by an architect, who, as was usual in all such cases, had power to order anything to be pulled down, and under the contract to give certificates to the plaintiff as the work progressed. The architect had thus been employed by the defendant, and the main defence to the action now appeared to be that the defendant disputed the work, which had been approved by his own architect. He (Mr. Butt) maintained that the defendant could not shirk his liability on that ground. A sum of 4,480*l.* had been paid under the contract, and the work was continued. On the 5th of September, 1879, the architect, Mr. Pope, gave a certificate to the plaintiff for 50*l.*, but the defendant refused to pay the amount, and it was only when the action had been brought that the money was paid into court. On the 21st of September the architect gave a further certificate for 87*l.*, but under the terms of the contract only half of that amount was due at the time, and consequently the plaintiff sent in his claim to the defendant for 43*l.* under the second certificate. Therefore the total claim of the plaintiff up to that time was for 93*l.* The defendant still refused to pay anything to the plaintiff, who in the meantime had to make heavy disbursements for materials supplied in respect of the works he had undertaken for the defendant. The only course which was then open to the plaintiff was to issue a writ, which he did, for the amount due, and as other sums became due to issue two other writs. The total amount which the plaintiff now sought to recover was 1,174*l.* 17*s.* 10*d.*

Evidence was called in support of the learned counsel's statement, the architect denoting that the work had been carried out to his entire satisfaction.

Mr. Finlay, on behalf of the defendant, informed the Court and the jury that behind the minor points of defence, the chief contention on behalf of his client would be that the architect had certified for the plaintiff's work to an exorbitant amount, and beyond that to which he was entitled.

The jury gave a verdict for the plaintiff for the amount claimed, with interest, less a sum of 142*l.* paid into Court

THE ENGLISH LAND SYSTEM.

SIR,—Granted that the laws of entail should be revised, and primogeniture done away with, as they ought to be, I allow, your correspondent is in error in supposing that it would lead to peasant farming. Estates mostly pass by "settlement," seldom by "entail," and never, as a rule, through "intestacy," as any country lawyer will tell you; otherwise, how is it that in counties where primogeniture does not exist the land is not in more hands than elsewhere?

It is a proper system of registration of titles that is the *sine quâ non* of all land reforms. I thought the idea of a peasant proprietorship on the French system for England had long been exploded. They have a better climate (although, no doubt, for all sound farming, the statement of a well-known M.P., that ours was the finest climate in the world, contains truth, notwithstanding the roars of laughter it gave rise to when made), a more fertile soil naturally, and a most frugal people. If it paid, there would be plenty of small owners and farmers in this country; but it does not.

Forty years ago there were in my parish,—a very small agricultural one,—six yeomen, that is, men living on and farming their own freehold land, and probably by going further back you would find there were many more such. Now there is only one left, and he has let his land to an adjoining farmer, instead of working it himself. If it paid, why did all these hard-working, practical men give up, particularly as in this case there was no squire or rich neighbour to buy them out at a fancy price? As nearly every purely agricultural parish in England gives, I believe, more or less similar results, it seems useless to think of peasant proprietorship. My impression is this,—in a corn, cattle, sheep, and dairy country,—in fruit, poultry, and garden produce we cannot now compete with more southern countries. If your correspondent can give practical proofs that we can, throughout England, he will be a public benefactor, as in my neighbourhood, even the poors' lands, free of rent and all restrictions, find no cultivators, they tell me.

A HAMPSHIRE MAN.

WOOD PAVEMENT.

SIR,—I have a washing-down place to pave in wood blocks. Will some one kindly say the size generally used in London; and if bedded in cement joints, should they be done in Sir William Barnett & Co.'s patent process?

S. P.

CHURCH-BUILDING NEWS.

North Curry.—The parish church of North Carry is being restored under the immediate direction of Mr. John Oldrid Scott, as regards its nave, aisle, and transepts; and as to the chancel, from the designs of Mr. Ewan Christian, the architect to the Ecclesiastical Commissioners. North Curry Church is a particularly interesting one, and has a central octagonal tower, which is a most unique feature. The church stands in the midst of a graveyard, in which are the remains of a good ancient cross. One point of exceptional interest about the building is the excellent groining under the tower. The work is now being rapidly pushed forward, and it is hoped that in a few months the renovated building will be ready for re-use. Mr. Trask, of Norton-sub-Hamdon, is the contractor; the carved stone work is by Mr. Harry Hems, of Exeter; and Mr. G. Hannaford is the clerk of the works.

Stockton (*Wilts*).—The parish church of Stockton, near Codford St. Mary, Wilts, is a very interesting example of transition Norman in the nave, Early English in the lower part of the west tower, and fifteenth century for the clearstory to nave and to the aisles. The chancel is Early English, with a peculiar east window of the transition between Early English and Decorated. It has a vesica placed horizontally in the head, an almost unique example, it is believed. Then the iconostasis arrangement of the Greek Church in an English building is curious,—a mere chancel doorway and no arch, with hagioscopes on each side, all of the Early English period. The west chancel wall seems to have been built not on the lines of the original Norman chancel-arch, but further westward, so that the last small bay of the nave arcade is partly built into it. The north nave aisle contains an elaborate Elizabethan monument to John Topp, a great local benefactor. In the south aisle is a remarkable mural tomb of the thirteenth century, containing the effigy of a lady lying on her side. The upper part of the tower is fifteenth-century work. The north aisle has practically been rebuilt, the church re-seated with wainscot benches, the nave and aisle roof renewed and covered with lead, the tower underpinned and strengthened, a proper choir arrangement made, with handsome oak seats. The windows have also partly been filled with stained glass. The total cost (exclusive of decorative work) has been upwards of 1,800*l.* The architects were the late Mr. Ferrey, F.S.A., and Mr. Edmund B. Ferrey. The works were not carried out by contract, but by different tradesmen.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

West Drayton.—The Chapel of the Sacred Heart of Jesus, in St. Catharine's (R. C.) Church, West Drayton, has just been completed by the erection of an altar and reredos. The altar is of the open form, supported in the front by columns. The reredos occupies the whole width of the chapel, reaching nearly to the ceiling, and is enriched by a statue of our Lord sculptured in white alabaster, and by paintings by Mr. J. Bouvier of St. John the Evangelist and St. Margaret Mary. The materials are Caen stone and alabaster, style English, fourteenth century. The work was executed by Mr. G. F. Anstey. The side-screens of the Chapel of the Sacred Heart and of the Lady-chapel are of stone, forming integral portions of the structure, and they have been completed to the design of the architect by the execution of the carving, and of two sculptured panels, representing the Annunciation and the Agony in the Garden. A font of Caen stone has been placed in the baptistery. It is octangular on plan. Seven sides are occupied by carved emblems of the Passion; the eighth by a niche, containing the representation of the Baptism of our Lord. The font and carving to the screens were executed by Mr. McCulloch. The whole has been carried out from the designs and under the superintendence of Mr. S. J. Nicholl, architect, Caversham-road. The window of the baptistery has been filled with stained glass, executed by Messrs. Lavers, Barraud, & Westlake.

VARIORUM.

THE new edition of Walker's "Aristology, or the Art of Dining," to which we referred in our last when speaking of a "Novel Banquet," is edited and annotated by "Felix Summerly," and published by George Bell & Sons. *Ariston* is Greek for dinner, and that explains Walker's title given to a little book which may be read with as much pleasure and profit now as when he wrote it in 1835. If it be true that, as Brillat Savarin says, "the fate of nations depends upon how they are fed," more and more thought should be directed to the cookery question. The editor has supplied some capital notes, and for our own sake we hope all who may intend at any time to ask us to dinner will read it.——The *Welcome*, for July, one of Messrs. Partridge's magazines for the home circle, includes an interesting memoir of President Garfield (with a good portrait), written before the recent infamous attempt to murder him. His career has been remarkable; his origin so lowly that he was four years old before he had a shoe on his foot. Ultimately he got to college, and his course afterwards was always upwards.——The *Leisure Hour* gives some particulars of the waste-paper trade. "In London the number of wholesale dealers in waste-paper is about fifty, and the extent of the business of some of these is enormous. Two years ago the waste of the Government Stationery Office alone was valued at nearly 34,000*l.* We hope there is some diminution now, after attention has been called to the abuse, for assuredly this vast sum brought unfair perquisites to some pockets at the cost of the nation. The first process in the utilisation of waste-paper is necessarily its collection. This, in London, is principly effected by the agency of the marine-store dealers. They number some 600, and derive their supplies from all sorts of miscellaneous sources. Servants who take the paper as their perquisites, charwomen, office-cleaners, children anxious to earn a penny, thieves, frugal housewives, and the miserable individuals who, with downcast gaze, prowl the streets in search of scraps of any kind, all act as jackals to these waste-paper lions. But of late years there has been established a superior class of dealers, who buy waste-paper in large or small quantities, and send their vans to collect when the quantities are considerable and the distance is not too great. When the vendors reside in the country, sacks are sent to pack it in, and the paper may be returned either by rail or carrier, being paid for either by cheque or post-office order. Small quantities may be brought to the offices and paid for on the spot. Looking over the books of a very large and respectable dealer in this article, we find amongst his *clientèle* peeresses, bishops, colonels, clergymen, and persons of every degree; while parcels come from Sutherlandshire in the north to St. Leonards in the south, and from Cornwall in the west to Yarmouth in the east. The transactions range from 3d. to 1,700*l.*,—the former sum being paid to a little street waif, and the latter for the waste of a railway company."

Miscellanea.

Sutton Bridge Dock.—Lord Colville, Mr. Tennant, Mr. Joseph Shuttleworth, and other directors of the Great Northern Railway, together with Messrs. English, of Peterborough and Wisbech; Mr. Thorold, of Sutton Bridge; and other directors of the Dock Company, have held a consultation with Sir John Coode, C.E.; Mr. John Fowler, C.E.; Mr. Johnson, C.E., and Mr. Brunlees, C.E., on the steps to be taken to restore the Sutton Bridge Dock works. It was ascertained that no further damage of any consequence has accrued to the walls of the basin, while the massive lock-walls and invert betray no sign of settlement or injury. A few days ago it was discovered that water from the dock-basin, which is 13 acres in extent, had found its way under the foundation of the lock, and was scouring from under it the silt or sand upon which it is built, and issuing into the river. This was considered surprising, seeing that the length of the subterranean channel so excavated must be at least 300 ft., that being the distance between the front of the apron of the dock and of the lock and the edge of the apron at the river end of the lock. At low-water spring-tides the difference in level between the water in the dock-basin and that in the river outside is 24 ft.; and the powerful hydrostatic pressure of this head has to be sustained by the lock-gates, by the abutments and foundations of the lock, and by the stratum of soil which underlies the foundation. The silt, a mixture of fine sand with a small proportion of clay and the minute shelly envelopes of animalculæ, is so porous and easily transportable by water, that a slight percolation of water through it quickly erodes the soft material, and establishes a continuous current, and a trifling issue of water through a crevice will in perhaps a single hour undermine and burst up the most solid brickwork structure. This forms a remarkably difficult soil in which to construct a lock or a sluice. Engineers pronounce it treacherous, and deep scouring away of a foundation such as this at Sutton Bridge is said to be unforeseen, and an accident which no professional skill could possibly prevent. Local authorities, however, who have had extensive practice in embanking and sluice-building in this unstable silt, take a very different view. They maintain that silt is an admirable base on which to build, provided it be properly treated. It remains firm, and will support any weight, so long as no current is permitted to flow through it from a body of water having power to enlarge the volume of that current.

Shops, Albany-road, Camberwell. — A number of shops and houses have recently been erected on a portion of an estate belonging to Mr. A Stedall. The upper floors are arranged on the flat system; the fronts are faced with Suffolk bricks, the cornices, strings, and moulded reveals of windows being formed with moulded bricks; the pilasters, trusses, spandrels under arches of windows, &c., are in Box ground Bath stone. Mr. G. Green, of Clapton, is the general contractor; Messrs. Francis & Co. supplied the revolving shutters; the carving was done by Mr. J. Wormleighton; Mr. George Edwards is the architect.

The Memorial to the Late Sir Gilbert Scott.—The memorial brass which has been deposited in Westminster Abbey over the grave of the late Sir Gilbert Scott was uncovered on Wednesday by Archdeacon Jennings, in the absence of Dean Stanley, who was prevented by illness from performing the ceromony.

Strike of Deal Carriers in Gloucester.—A further difficulty has been raised in connexion with the already sufficiently depressed state of the trade of the port of Gloucester, by an unfortunate strike amongst deal carriers employed there. The following printed notice, in consequence of the continued depression in trade, was posted about the Docks a short time ago:—"The timber importers of Gloucester hereby give notice that on and after 1st July next, the rate of wages will be 3s. 6d. per day for day-work, and the piece tariff will be as under: For all deals, battens, and scantling (pitch-pine excepted) dropped within 30 ft. of the inner rail of the Midland Railway Company—deals, battens, and scantling per standard, 2s.; boards per standard, 2s. 6d. Ditto, piled up to, and within fifty yards of the inner rails, as above—deals, battens, and scantling per standard, 2s. 6d.; boards per standard, 3s. 3d., 3d. per standard extra for every additional twenty-five yards beyond the fifty yards above mentioned. Gloucester, June 20th, 1881." The men regarded this as a breach of an arrangement come to two years ago, whereby they were to be paid 3s. 6d. per day during the months between September and July, and 4s. a day in July and August. The consequence was that early on Monday the deal carriers employed by Messrs. Price & Co., Nicks & Co., Barkworth & Spaldin, Booth & Co., and T. Adams & Co., numbering about 300 in all, struck work for the extra 6d. a day. Some few men who continued work were induced to join the great majority about mid-day. The men gathered by a vessel which was being discharged for Messrs. Adams by men on piece-work, and they also struck. The masters met a deputation from the men, when they offered to concede the 4s. a day, on condition of the men accepting a reduction of 6d. per standard on piece-work. The men rejected this.

A Concrete Railway Platform—Mr. J. B. Fraser, architect to the Great Northern Railway for the Leeds District, and Mr. Charles Trubshaw, architect for the Northern Division of the Midland Railway, attended with other gentlemen, by invitation, in an enclosed yard in Grace-street, Leeds, to witness the trial of a section of railway platform constructed on a new plan. The section, which was 18 ft. broad and 9 ft. long, was made on the 16th of December last, by Mr. Alfred Walker, maker of concrete pavement and fireproof floors. In contra-distinction to the old style of platform, that inspected was made entirely of concrete. There were five piers running lengthwise along the platform, and on these were placed the floor, which has a facing of granite concrete, all the other portion being of concrete made from the Aire-side slag. The platforms are constructed, as all builders will know, in a moist state, and sets of iron girders, 2 in. in breadth, are imbedded in the concrete to give it greater coherence. Twenty tons of pig-iron, brought from the Aireside Foundry, Hunslet, were provided. Fifteen tons of this material were piled upon a portion of the platform, 3 ft. square, and no sign of fracture was apparent; indeed, Mr. Leonard Cooper, of the above-named foundry, who was also in attendance, stated that in his opinion the platform was strong enough to bear, on the same space, a pressure of forty tons.

Failures in the Building and Allied Trades during the past Six Months.—Mr. Richard Seyd has compiled some statistics of failures in the United Kingdom during the first half of 1881. The number of failures announced in the first half of the year 1881 has been 6,279, of which 690 are in the financial, wholesale, and manufacturing branches of trade, and 5,580 in retail trade, professional pursuits, builders, publicans, among the working classes, &c. The failures in the wholesale trades included:—Engineers, founders, iron, metal, and hardware merchants, 121; and timber trade, 17. In retail trades, &c., the failures included,—Auctioneers, house-agents, and surveyors, 68; blacksmiths, 35; brickmakers, 33; builders, architects, &c., 304; cabinetmakers, upholsterers, furniture, &c., makers, 74; carpenters, joiners, wheelwrights, 132; labourers, bricklayers, slaters, &c., 82; lime burners, 2; masons, 55; plumbers, painters, gasfitters, 139; and timber dealers and sawyers, 11.

Technical Education.—The Prince of Wales, who is President of the City and Guilds of London Institute for the Advancement of Technical Education, has consented to lay the foundation-stone of the Central Institution, in Exhibition-road, South Kensington, on the afternoon of Monday next, July 18th.

The Importance of Sanitary Knowledge to Young Architects.—Last week Mr. H. Masters read a paper before the Junior Architects' Society, at the Fine Arts Academy, Bristol, in the course of which he advised the young architect to take every opportunity of observing the intelligent and the slovenly workmen in their work, and to judge for himself as to the correct mode of executing works, and not to be satisfied by following strictly the text-books, but rather to think for himself; and he pointed out some of the errors in the published model specifications. A reference was made to the mode of drainage adopted by the designers of Mediæval buildings, and also to the advice given by Vitruvius in relation to drainage and the selection of healthy sites for dwellings. Defects in the drainage of the modern builders' houses were pointed out, and it was urged that costly, elaborate systems were often introduced, to the exclusion of more simple, inexpensive, and scientific modes; examples of defective sanitation were shown by drawings, and remedies suggested. In closing, the speaker drew attention to the multiplicity of small, so-called ventilating pipes which might be seen upon a large number of the houses of Bristol, Clifton, and elsewhere, and they would find, upon investigation, that such contrivances in a large number of instances were ineffective, in consequence of being put up by those who were ignorant of the simplest principles that govern the motion of air. Such contrivances erected in ignorance gave a sense of security, but were often a delusion and a snare.

The Vyrnwy Waterworks for Liverpool. On Thursday last the first stone of the Vyrnwy waterworks was laid by the Earl of Powis. The Lake Vyrnwy will be formed by the construction of a masonry embankment across the south-eastern end of the Upper Vyrnwy Valley; the length of the lake will be 4¾ miles; area of lake, 1,115 acres; contents of the lake, above the level at which the water will be drawn for the supply of Liverpool, 11,900,000,000 gallons; available drainage area contributing to the lake, 22,000 acres; length of masonry embankment from rock to rock, 1,255 ft.; height of masonry embankment from lowest part of rock foundation to coping of parapet, 139 ft.; height of masonry embankment from river level to coping of parapet, 98 ft.; length of contributing tunnel from river Marchnant to lake, about 1⅞ miles; length of contributing tunnel from river Cowny to lake, about 1¼ miles. The length of the aqueduct from the Lake Vyrnwy to the reservoirs of the Liverpool Corporation at Prescot will be 67 miles; this aqueduct will consist of a triple line of pipes and of three tunnels, two of seven-eighths of a mile and one of 2¼ miles in extent. On the line of aqueduct there will be several filter-beds and minor reservoirs. It is estimated that the daily water supply to Liverpool from this source will be (including compensation) 52,000,000 gallons.

The Indian Public Works Department. In the House of Commons on Monday last, Mr. Carbutt asked the Secretary of State for India whether any scheme for the re-organisation of the Indian Public Works Department was under contemplation, and whether it would in due course be laid before the House; and whether due consideration would in any such scheme be given to the frequent requests from the Civil Engineers in the service for an amelioration of their pension rules, and for equality of treatment generally with the officers of the Royal Engineers in the same service. The Marquis of Hartington, in reply, said: The question of re-organising the Engineering branch of the Public Works Department in India is now receiving the consideration of the Home Government, and due attention will be given to representations which have been made in respect to the pension rules and to the position generally of the officers of the department. The question will form the subject of communication between the Secretary of State and the Government of India, and when a scheme has been settled there will be no objection to lay the same before the House.

The Beaconsfield Memorial.—A site has finally been decided upon in Westminster Abbey for the national memorial to the late Earl of Beaconsfield. The spot selected is in the north aisle, on the pillar just beyond the memorial to Sir Robert Peel. The work will shortly be commenced.

Ipswich.—The new lock to the Ipswich Dock, the new Post-office, and the new Museum are to be opened on the 27th of July.

Ashburnham House.—A meeting of old "Westminsters" was held on the 11th inst. at the rooms of the Royal Asiatic Society, Albemarle-street, to protest against the proposed exchange of Ashburnham-house, standing on ground measuring 10,000 square feet, for another only covering 4,000 square feet. It was explained that by the Public Schools Act of 1868 a governing body was substituted for the government of the Dean and Chapter, and with this change also came a separation of property—15,000*l.* was handed over, together with 3,500*l.* annuity from the Commissioners, and four houses were given. The house in question was the residence of Lord Thynne, and was supposed to be built by Inigo Jones, and it was alleged by the Dean that as such it ought to be preserved as a public Art treasure, but if it remained the residence of a canon it would be less available than at present for public inspection. It was contended that as the influence of the Dean and Chapter was predominant on the governing body, that body no longer represented the interests of the school in matters between the two bodies. It was arranged that the Charity Commissioners should be asked to withhold their sanction to the proposed transfer, and a deputation was appointed to see the Commissioners on the subject.

The Proposed Removal of the Royal Mint. The Select Committee to whom the London City Lands (Thames Embankment) Bill was referred, have unanimously reported adversely to the measure. By the Bill thus rejected, the Corporation proposed to sell to the Government three acres of land on the site of the City gas-works, for 254,475*l.*, as a site for the proposed new Mint, and to purchase of the Government the site of the old Bankruptcy Court in Basinghall-street for 93,400*l.* It was estimated that the new Mint buildings would cost 110,000*l.* The committee are of opinion that there is no ground to justify this large expenditure. They think that the present Mint buildings, with some inconsiderable alterations, and with additional machinery for rolling the metals which may be placed in the room now occupied by the obsolete and disused machinery for cutting out, and with improved motive power, may, within a very reasonable period, and for a moderate outlay, be made adequate for a coinage at least as large as that contemplated in the new Mint.

The City Churches.—In the House of Lords, on Monday, the Earl of Onslow moved "That an humble address be presented to her Majesty praying that her Majesty will be graciously pleased to issue a Commission to inquire into the working of the Union of Benefices Act, 1860, and the state of the several ecclesiastical parishes in the City of London with reference to their population and to the value of the benefices attached to them, with a view to the suggestion of such further union of benefices, disposal of the site of churches, and application of the funds arising therefrom as may, with due regard to the architectural and historical features of the existing edifices, be more conducive to the efficiency of the Church in the metropolis and its vicinity." After a discussion (in the course of which Lord Houghton suggested that these fine edifices, some of which were products of the genius of Sir Christopher Wren, instead of being pulled down and ruthlessly destroyed, might be used for other, and especially for educational purposes), the motion was withdrawn.

New Floating Small-pox Hospital.—The Admiralty Board have granted to the Metropolitan Asylums Board the use of H.M. steamship *Atlas*, 5,260 tons, which is now being rapidly altered and fitted up, off Greenhithe, for the reception of small-pox patients. Upon completion of the work the ship will be moved higher up the river, and moored off Deptford Creek. H.M. steam frigate *Endymion*, 3,197 tons, has also been granted for use as quarters for officers in attendance on the patients, and is being fitted with a steam laundry and the necessary cooking apparatus. The alterations and fitting up of the ships are being carried out under the direction and supervision of Messrs. A. & C. Harston, architects.

The late Lord Lawrence.—Mr. Woolner's bust of Lord Lawrence in Westminster Abbey was unveiled on Tuesday last. The bust stands on a pedestal representing the Indian lotus-leaf, against the north wall of the church on the west of the gate called the Canons' door, through which a glimpse of the green turf of the Paradise and of the cloisters round it is obtained, and nearly underneath the monument of Sir James Outram. It is of Carrara marble.

The New Bridge at Battersea.—The bridge, as now sanctioned by both Houses of Parliament, will be an iron structure, erected somewhat to the east of the present bridge, at an estimated cost of 231,000*l*. The width will be increased from 23 ft. to 40 ft., and the number of spans decreased from seventeen to five, the centre one of which will be 173 ft. wide. The new bridge will be 6 ft. higher than the present one, which will allow 15 ft. above Trinity high-water mark.

Builders' Benevolent Institution.—The annual general meeting of the subscribers and donors of this charity will be held at Willis's Rooms, King-street, St. James's, on Thursday, the 28th inst., at three o'clock p.m. Part of the business consists of a proposal to alter Rule II., by leaving out in lines 3 and 4 the words, "for each candidate to be elected."

A Brickmaker's Will.—The will (dated May 27th, 1876), with four codicils, of Mr. George Smeed, late of Sittingbourne, Kent, brickmaker and farmer, who died on May 2nd last, at Gore Court, Tunstall, Kent, was proved on May 31st last, by Richard Prall and William Trees Jackson, the acting executors, the personal estate being sworn under 160,000*l*.

Messrs. Clark, Bunnett, & Co., Limited, have fitted one of their patent invalid lifts on the hospital ship *Atlas*, and are now completing the food lifts on the administrative ship *Endymion*. The company are also, we are informed, carrying out the War Office instructions to fit their revolving shutters to the embrasures of the batteries at Gibraltar.

Middlesex Industrial School for Girls. This building at Bedfont, near Feltham, Middlesex, will be inspected upon its completion on Monday, the 18th of July.

New Royal Academician.—At a General Assembly held on Wednesday evening last at Burlington House, Mr. Edwin Long was elected a Royal Academician.

Cement from Canada.—The *Liverpool Journal of Commerce* says it is expected that a large quantity of Canadian cement will be shipped to Europe this fall.

TENDERS

For Falwood Workhouse extension, Preston Union. Mr. Joseph Harding, architect:—

John Walmsley	£12,400 0 0
W. Eaves	11,399 0 0
Albion Steam Saw Mills Company..	11,350 0 0
Tullis & Son	11,096 11 10
Wm. Welsby	10,996 0 0
Wm. Whiteside	10,577 6 2
Cooper & Tullis	10,450 0 0
W. Hothersall	10,444 19 0
John Christian	10,421 0 0
John Bamber	10,350 0 0
Robert Saul (accepted)	10,323 0 0

Accommodation will be provided for 124 additional patients, with the necessary administrative departments.

For St. Stephen's Church, Wandsworth, S.W. Messrs' Lee Bros. & Pain, architects. Quantities by Messrs' Widnell & Trollope:—

Lapthorne	£8,796 0 0
Dove Bros.	8,285 0 0
Shaw	8,210 0 0
Goddard	8,096 0 0
Nightingale	7,961 0 0
Carless	7,853 0 0
Roberts	7,732 0 0
Hobson	7,670 0 0
Adamson	7,495 0 0
Pain	7,484 0 0
Parsons	7,325 0 0
Aviss & Co.	6,986 0 0

For additions to 15, Berkeley-square, for Mr. F. Lehmann. Mr. E. Hoole, architect:—

Williams & Son	£1,541 0 0
Lathey Bros.	1,457 0 0
Wm. Smith	1,190 0 0
F. Higgs	1,109 0 0
Jas. Holloway	1,090 0 0

For alterations and enlargement of Mission Hall, Short's-gardens, Endell-street, St. Giles's. Mr. W. Milford Teulon, architect:—

Hunt	£944 0 0
Read & Son	879 0 0
Langmead & Way	680 0 0
Kilby (accepted)	658 0 0

For alterations and additions to the Montrose Tavern, St. James's-road, Barnsbury, for Mr. John Chinnery. Mr. W. F. Potter, architect:—

S. Godden, Bryanstone-square	£750 0 0
J. Tory, Barnsbury	694 0 0
H. Cook, Farringdon-street	671 0 0
C. Dearing & Son, Islington	642 0 0
G. W. Butler, Barnsbury (accepted)	637 0 0

For erection of chancel, vestry, &c., All Saints' Church, Wolverhampton. Mr. T. Tayler Smith, architect. Quantities by Mr. John Darch:—

Hayes	£2,050 0 0
Jones & Co.	1,659 0 0
Bradney & Co.	1,598 0 0
Lynes	1,492 0 0
Ford & Son	1,450 0 0
Teece	1,179 0 0

For new stables, sheds, &c., for the Stratford-upon-Avon Corporation Urban Sanitary Authority. Mr. Thos. T. Allen, town surveyor, architect. Quantities supplied by the architect:—

Bennett	£719 0 0
Compton	660 0 0
Claridge	630 0 0
Smallwood	600 0 0
Cox & Kings	580 10 0
Callaway	580 0 0
Wilkinson	572 10 0
Robbins	568 0 0
Whateley	555 0 0
Harris	551 0 0
Price	534 0 0
Hughes & Son	490 0 0
Roberts & Sons (accepted)	469 0 0
Young	458 11 10

For girls' new school-room, at the National Schools, Stratford-on-Avon. Mr. Thos. T. Allen, architect. Quantities supplied by the architect:—

Robbins	£650 0 0
Hewins	648 10 0
Kennard	602 0 0
Hughes & Son	600 0 0
Wilkinson	586 18 0
Roberts & Sons	586 0 0
Whateley	560 0 0
Harris (accepted)	542 0 0
Young	525 10 0

For erecting offices and rooms, for Mr. W. Petitt, in Blatchington-road, West Brighton:—

H. Cresswell	£335 0 0
J. Collins	288 11 0
Jas. Nurcombe (accepted)	285 0 0

For new road and sewer at West Hampstead:—

P. G. Pound	£723 0 0
W. H. Watts	700 0 0
W. Crockett	635 0 0
C. Killingback	595 0 0
Nowell & Robson	579 0 0

For residence at Sheffield, for Mr. O. P. Ibbotson. Mr. J. P. Earle, architect:—

Hardwick & Burton, Sheffield	£427 0 0
Armstead & Vasey, Sheffield	410 0 0
Willows, Sheffield	370 0 0
Rodley & Sons, Sheffield	367 0 0
J. Rathbone, Sheffield (accepted)	364 0 0

For rebuilding Nos. 83 and 85, Walworth-road, for Mr. Phillip Saillard. Mr. Benjamin Tabberer, architect:—

R. Conder (accepted)	£2,550 0 0

For new club premises at the Avenue, for the Blackheath Club. Mr. Benjamin Tabberer, architect:—

Nightingale	£4,292 0 0
Mark	4,270 0 0
Kirk & Randall	4,188 0 0
Staines & Son	4,062 0 0
Jerrard	3,943 0 0
Tongue	3,900 0 0
Newman	3,887 0 0
Rider & Son	3,650 0 0
Lawrance	3,600 0 0
R. Conder (accepted)	3,535 0 0

Accepted for the erection of the Bowling Green Board Schools, for the Stainland-with-Old-Lindley School Board. Messrs. Leeming & Leeming, architects. Quantities by the architects:—

Mason's Work.

Taylor & Helliwell, Stainland	£1,007 0 0

Carpenter and Joiner's Work.

Park, Stainland	294 0 0

Plumber and Glazier's Work.

Aspinall, Elland	98 0 0

Plasterer and Slater's Work.

W. Crowther, Stainland	117 0 0

Painter's Work.

Townsend, Stainland	25 0 0

Whitesmith's Work.

Hirst Bros., Halifax	110 0 0

Heating Apparatus.

Brook, Huddersfield	65 0 0
Total accepted tenders	£1,714 0 0
Total highest tenders	2,490 10 0

For the erection of Board Schools, Arnold's Paragon, Crampton-street, Newington Butts, for the School Board for London. Mr. E. R. Robson, architect:—

G. S. Pritchard	£14,100 0 0
Higgs & Hill	13,628 0 0
Staines & Son	13,489 0 0
Hook & Oldrey	13,389 0 0
B. E. Nightingale	13,173 0 0
W. Tongue	13,098 0 0
C. Wall	13,000 0 0
J. Marsland	12,835 0 0
W. Shepherd	12,821 0 0
Kirk & Randall	12,659 0 0

For the enlargement of Board Schools, Lant-street, Borough, for the School Board for London. Mr. E. R. Robson, architect:—

J. Grover	£4,791 0 0
Kirk & Randall	4,586 0 0
Staines & Son	4,549 0 0
Tongue	4,497 0 0
S. J. Jerrard	4,473 0 0
Higgs & Hill	4,443 0 0
B. E. Nightingale	4,283 0 0
W. Shepherd	4,273 0 0

For rebuilding printing works, for the *City Press*, 16, New-street, Cloth-fair, for Messrs. W. H. & L. Collingridge. Messrs. Collier & Merrin, architects:—

Brass (accepted)	£3,600 0 0

For forming roads and sewers in the first section of eight proposed new roads, Clapham Park, on the south side of Clapham-common. Messrs. Waring & Nicholson, surveyors:—

Chafon	£940 0 0
Mayo	823 15 0
Rigby	795 0 0
Blackmore	790 0 0
Nobbs	760 0 0
Iles (accepted)	700 0 0

For the erection of new Wesleyan Chapel, Streatham. Mr. Chas. Bell, architect. Quantities by Mr. H. Lovegrove and Messrs. Sandall & Corderoy:—

Maxwell	£7,980 0 0
Tyerman	8,030 0 0
Tarrant	7,872 0 0
Dove Bros.	7,695 0 0
Brealey	7,620 0 0
Taylor & Grist	7,595 0 0
Woodward	7,571 0 0
Watson	7,609 0 0
F. Higgs	7,320 0 0
Hickinbotham	7,259 0 0
Bowyer	7,139 0 0

For alterations and repairs to the Islington Presbyterian Church, Colebrooke-row. Mr. Chas. Bell, architect:—

Panter & Powditch	£790 0 0
Ebbage	782 0 0
Grover	756 0 0
Wontner Smith, & Son	680 0 0
Bamford (accepted)	665 0 0

For the erection of a dwelling-house, Abingdon, for Mr. Job Coxeter. Mr. Edwin Dolby, architect. Quantities by the architect:—

Allen, Leicester	£1,049 0 0
Barrett & Drew, Abingdon	950 0 0
Dover, Oxford	950 0 0
Wilkins & Sons, Eynsham	939 0 0
R. Drew, Abingdon	887 10 0
Selby, Oxford	810 0 0
Holland, Thame	800 0 0
Hunt, Abingdon	774 0 0
Kingerlee, Banbury	748 0 0
Buckle & Wheeler, Abingdon*	728 0 0

* Accepted.

For the erection of a new shop, &c., at Single Gate, Merton, for Mr. W. Goodyear. Mr. R. Cruwys, architect:—

Stayner, Great Dover-street	£647 0 0
Johnson, Wimbledon	628 0 0
Barwell, Merton	586 0 0
Norris, Tooting	582 0 0
Richardson, Clapham	569 0 0
Rice, Clapham	531 0 0

Robinson, Wandsworth (accepted with modifications).

For additional story to the Hand and Flower, Parnell-road, Bow, for Mr. J. Burgess. Messrs. Hills & Fletcher, architects:—

Brooks	£418 0 0
Lewin	417 0 0
Coles	398 10 0
Alexander, Bow (accepted)	247 0 0

For constructing new road and sewers at Jeremy's-green, Edmonton, for the Committee of Ray's Estate:—

Rutty	£999 0 0
Nichols	957 0 0
Wilkes & Co. (accepted)	947 16 0

For works in remaking and draining roadways, for the Guildford Urban Sanitary Authority. Mr. H. Peak, surveyor:—

Harvey-road:—

W. Smith & Sons, Guildford	£1,372 0 0
R. Pink, Milford	1,350 0 0
Martin, Wells, & Co., Aldershot*	1,239 0 0

* Accepted.

Guildford Park-road:—

Martin, Wells, & Co., Aldershot	£410 4 9
R. Pink, Milford	410 0 0
W. Stafford, jun., Godalming	370 0 0
W. Smith & Sons, Guildford (accepted)	360 4 0

Upperton-road:—

Martin, Wells, & Co., Aldershot	£153 18 6
R. Pink, Milford	150 0 0
W. Stafford, jun., Godalming	136 15 0
W. Smith & Sons, Guildford (accepted)	132 10 0

Denzil-road:—

R. Pink, Milford	£195 0 0
Martin, Wells, & Co., Aldershot	180 12 8
W. Stafford, jun., Godalming	173 8 0
W. Smith & Sons, Guildford (accepted)	169 10 0

For alterations to the Trafalgar-road School, Horsham, for the Horsham School Board. Mr. W. Buck, architect:—

Peters & Redford, Horsham	£935 0 0
Sharp, Horsham	875 0 0
H. Potter, Horsham (accepted)	845 0 0

For alterations at the Trevor Arms, Knightsbridge Mr. H. R. Cotton, architect:—

Canning & Mullins	£1,035 0 0
Toms	994 0 0
Foxley	978 0 0
Stimpson & Co.	933 0 0

For the erection of a boiler-house and chimney-stack at Homerton Fever Hospital. Mr. John Walker, C.E., architect. Quantities supplied:—

Crockett	£657 0 0
Sawyer	620 0 0
Ivory	620 0 0
Garrud	583 0 0
Carpenter & Pool	580 0 0
J. C. Richardson	520 0 0
Crisp & Tomlin	509 0 0

For the erection of six dwelling-houses at Grange Park-road, Leyton, Essex, for Mr. A. Bacon. Mr. W. C. Livermore, architect:—

Hosking	£2,368 0 0
Sills	1,640 0 0
England & Thompson (accepted)	1,590 0 0

For cleaning and painting Paddington Chapel, Marylebone-road:—

W. Lovell	£252 10 0
C. Parry	230 0 0
J. Morris	226 4 6
S. Spencer & Son	224 10 0
W. Tasker	220 0 0
J. Petchey	205 0 0
W. H. Butcher (accepted)	179 19 0

For road and sewer works on the United Land Company's Starch-green Estate, No. 2:—

L. Cost	£1,734	0	0
C. Killingback	1,630	0	0
Wilkes & Co.	1,585	0	0
Jas. Trueman	1,519	0	0
Neave & Son	1,498	0	0
Jas. Neal	1,495	0	0
T. Huntley	1,480	8	6
G. George	1,400	0	0
Job Ball	1,390	0	0
John Cardus	1,390	0	0
Jas. Bloomfield	1,388	11	0
Geo. Acock	1,313	0	0
Jas. Stockwell	1,335	0	0
T. Pizzey	1,265	0	0
Nowell & Robson	1,260	0	0
Geo. Felton	1,229	0	0
H. Kempling	1,144	0	0
Geo. Aldred	1,105	0	0
Ford & Everett (accepted)	1,088	0	0

For the pulling down and rebuilding of 22, Budge-row, Cannon-street. Mr. E. E. Cronk, architect. Quantities supplied:—

Howard & Dorrell	£4,047	0	0
Cole & Riches	3,949	0	0
G. Parker	3,907	0	0
Julian & Co.	3,899	0	0
Macey & Sons	3,664	0	0
R. Conder	3,695	0	0
D. Jones & Co.	3,580	0	0
J. P. Groome	3,575	0	0
Young, Cochrane, & Fraser	3,410	0	0
John Garrud	3,283	0	0
Carpenter & Poole	3,235	0	0
Lucas & Son	3,169	0	0
J. O. Richardson	2,999	0	0
F. Warr	2,879	0	0

For the erection of Camden Parsonage, Chislehurst. Mr. Alfred R. Pite, architect. Quantities by Mr. Rookwood:—

Grover	£3,434	0	0
Hobson	3,453	0	0
Niblett	3,400	0	0
Patman & Fotheringham	3,348	0	0
Gumbrell	3,250	0	0
Falkner	3,235	0	0
Tongue	3,207	0	0
Diss	3,200	0	0
Cowland	3,195	0	0
Smith & Son	3,187	0	0
Staines & Son	3,172	0	0
Evans	2,925	0	0

For new roads, sewers, surface-water drains, and bridges over Pymmes Brook, for the British Land Company, Limited, on their East Barnet Estate. Mr. Henry B. Michell, surveyor:—

Killingback, Camden Town	£6,700	0	0
Pizzey, Hornsey	6,656	0	0
Acock, City	5,723	0	0
Jackson, Leyton	5,555	0	0
Peill, Bromley	5,523	0	0
Wilson, Walthamstow	5,500	0	0
Harris, Camberwell	5,191	0	0
Crockett, St. Pancras	5,357	0	0
Thompson & Son, Battersea*	5,245	0	0

* Accepted.

For new roads and surface-water drains, for the British Land Company, Limited, on their estate at Barking. Mr. Henry B. Michell, surveyor:—

Crockett, St. Pancras	£996	0	0
Acock, City	716	0	0
Harris, Camberwell	660	0	0
Wilson, Walthamstow	654	0	0
Killingback, Camden Town	652	0	0
Peill, Bromley	640	0	0
Thompson & Son, Battersea	600	0	0
Pizzey, Hornsey	589	0	0
Jackson, Leyton (accepted)	555	0	0

For new road and sewer for the British Land Company, Limited, on their Estate at Loughton. Mr. Henry B. Michell, surveyor:—

Crockett, St. Pancras	£805	0	0
Wilson, Walthamstow	775	0	0
Acock, City	737	0	0
Thompson & Son, Battersea	700	0	0
Killingback, Camden Town	680	0	0
Harris, Camberwell	675	0	0
Peill, Bromley	660	0	0
Pizzey, Hornsey	637	0	0
Jackson, Leyton (accepted)	633	0	0

For the erection of twenty-two cottages at Barking-road, East Ham, Essex. Mr. W. C. Livermore, architect:—

Sills (accepted)	£3,080	0	0

For residence, with studio, King's-road, Windsor, for Mr. J. H. Henry. Mr. Maurice B. Adams, architect. Quantities by Mr. H. Lovegrove:—

	House.	Conservatory.	Deduct if alternative.
W. Hearn, Lancaster Gate	£5,560	£369	£189
J. Norris, Staines	4,550	250	140
Woodward, Finsbury	4,237	280	110
Goddard & Sons, Farnham	3,990	228	90
Martin, Wells, & Co., Aldershot	3,950	210	80
Hickinbotham, Teddington	3,680	210	45
W. Watson, Ascot	3,445	243	87

For alterations and additions to No. 18, The Avenue, Bedford Park, Chiswick. Mr. Maurice B. Adams, architect:—

J. Pollard, Paddington (accepted).

For alterations and additions at Laurel-cottage, Twickenham, for Mr. F. G. Beresford. Mr. E. A. B. Crockett, architect:—

Greenwood	£930	0	0
Mesum	726	0	0
Brunsden (accepted)	675	0	0

TO CORRESPONDENTS.

A Beginner (one of the Heath Societies of the Metropolis gives certificates, after examination, at a certain period of the year).—S. & Son (we have written for the architect's assent).—T. H. M. (next week).—H. M. and W. G. (under our mark).—P. P. (ditto).—S. (ditto).—E. & G. (should have sent names and amount.).—R. N.—R. K.—O. & R.—W. S.—W. P. G.—J. C.—J. S. & Co.—M. B. A.—G. M.—M. & Co.—W. G. S.—E. C.—A. & C. H.—R. C.—P. D. T.—A. O.—M. & S. s. E. F. jun. W. T. V. E. D.—Quantity Man.—R. C.—B. H. T. H. & F.—W. & N.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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Addressed to No. 46, Catherine-street, W.C.

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New York: A Great Growth.

IT is not merely the statement of the New Yorkers that New York has grown with a rapidity hitherto unknown in any of the great centres of population in the world. Actual and accurate statistics regarding America are more startling than even ordinary exaggeration, and we very much doubt whether a New Yorker who has been absent from his native city during the last thirty years,—could such be found,—would not find reason for more frequent surprises on his return than a Parisian on revisiting his beloved boulevards after a similar lapse of time. Now we learn by a recent telegram from New York, that the amount of building in New York is larger than at any time since the great fire of 1835. In the lower part of the city enormous ten and eleven-storied buildings for offices are being erected to meet the demands of business, and give capitalists the opportunity to invest money. In the upper part of the city the new dwellings are numbered by thousands. The effect on wages is 50 per cent. increase. Bricklayers get $4½ a day against $3 last year. Common labourers, like Italian immigrants, get $2½. There is a great demand for carpenters, stonemasons, bricklayers, and builders. They say it would be profitable to import German or English bricklayers and stonemasons, on two years' contracts for double the wages they are getting at home.*

Rapidly within the last generation the "Empire City" has been extending up the tongue of land which lies between the broad Hudson and the North River, and already from the Battery and Castle Gardens,—which speak, not alone by their names, but by their still uninjured old-world appearance, of the days when Manhattan was occupied by British red-coats, and took the name it now bears from its Royal governor,—up to Central Park, four miles and more up town, cross streets and long avenues are crowded and filled with houses, the greater part of which have sprung up within only a few years. The building activity of modern New York dates in a great measure from the fevered times which followed the War of Secession; till within some years since the activity continued unabated, to be arrested only a short time in the recent crisis through which America has now happily passed; and as we see by the news above quoted, prosperity again induces the builders to continue their work with a prospect of some years' steady employment before them. To those who know New York, it will be easy to picture the results that will follow on the revival of such an important branch of trade. There is no country where the interests of "real estate" are more closely studied, or where its value as a commercial factor is better understood. In this new impetus given to the building trade it is difficulty to calculate how many more streets up town, how many more "blocks," will be built to add on to the rapidly-extending city.

Thirty years ago, when the late Mr. Haight conceived the idea of building in,—or "on" as our cousins would say,—Fifth-avenue, a house that would eclipse any house which had yet been built in New York, he selected the corner of Fifteenth-street and Fifth-avenue for the spot, his wife, a famous New York beauty of that day, objecting to her husband building further up town, from the fear that they would be at too great a distance from the then fashionable quarter; and now fashionable New York resides in the vicinity of Fifty-eighth-street, in the neighbourhood of the Central Park, which, thirty years ago, was not even dreamed of. In this neighbourhood now magnificent houses abound, owned and occupied by people whose names are as familiar in London society as they are in New York or Paris, houses brilliant with the products of the ornamental centres of Europe. Notwithstanding the fastidious taste shown for many years past in the houses of some of the old English New York residents, we very much doubt whether the new generation, who are doing so much to make New York one of the finest cities in the world, will care to bestow credit or admit a very heavy debt of gratitude to the great social names that in New York, for the last hundred years, have been conspicuous above all others and all comers. From what we remember of the great treasures of art that New York undoubtedly possesses, and is rapidly acquiring, we fancy that the name of Astor, a new name comparatively, must already eclipse the more *dilettante* name of the old English resident and collector, Lenox, although, to draw any comparison between the Lenox library and the collection of pictures, and the more popular and noble foundation of the Astor Library, would partake of the invidiousness that is proverbially odious.

The new move up-town which the revival of the building trade will inevitably cause will probably before receiving another check envelop the Central Park; four years since, when last we saw New York, the few houses that had been built beyond the point at which the park commences, were mostly unoccupied; and the neighbourhood of the American Natural History Museum,—opened at about that time,—will be doubtless rapidly filled up. As an architectural feature the American Natural History Museum probably only merits that praise which is very correctly due to the perfect fitness of the design to the purpose intended, and in this respect certainly the completeness of the arrangement within, and the thorough manner in which the most minute object is displayed in a full light, produce on the mind of the visitor a feeling of admiration that entirely overcomes any disposition to criticise the exterior, although perhaps the most profound expert would find it difficult to quarrel with the manner or the perfection of the workmanship of the whole building.

The neighbourhood surrounding this magnificent institution surpasses all idea that we people at a distance can have in connexion with New York. Before the Museum stretches a park of exquisite beauty,—the Central Park,—nature having been aided by accomplished scientific and artistic gardeners who have studied in the forests and old-fashioned gardens of old England, in the prim and conventional gardens of France and Germany, and in the ideal and poetic villas of Italy and the East, and all this within a few hundred yards of the noble Hudson river, backed by the "Palisades," with their extraordinary geological structure. Here round this Central Park, the name of which indicates its being the proposed centre of New York, houses are springing up in rapid succession, all of which are now almost in immediate communication with Wall-street, at a distance of four or five miles, by means of the elevated railway, and well-made, if as yet scarcely well-kept, roads.

All this is certainly very different from what those who used to know New York can remember. Thirty years ago, when first we saw New York, Fourteenth-street was a quiet substantial street, occupied by a few of the oldest and wealthiest inhabitants, a considerable portion of the land being then occupied by lovely nursery gardens, owned by old Dutch proprietors, who had carried the cultivation of choice flowers to very great perfection, a delightful branch of commerce in which the New Yorkers to this day have retained their reputation. On those old gardens since then have sprung up a class of houses, the rents of which have enriched considerably the descendants of the wise old knickerbockers, many of whom still hold on in the belief that some day the enormous increase of the value within the last few years will augment still more; fortunately for these gentlemen their acquired wealth enables them to pay year by year the extraordinary heavy tax on the estimated value of their at present unrealised property.

Four years ago the building trade of New York was in anything but a prosperous condition. We were in New York at the darkest moment of its financial history; since then, we all know what difficulties the Americans have successfully fought and overcome, and not a week now passes, scarcely a day, that we in England, and that the whole of Europe, are not called

* New York telegram to *Daily News*, July 11, 1881.

upon to express our astonishment, and very often our admiration, for a condition of prosperity that no one doubts must affect greatly in one way or another, and most certainly for good, the whole of the world.

It is not only in New York that the success of America has given a great impetus to the building trade; we are constantly hearing from other great American cities of their rapid increase. With the wildest stories of the marvellous growth of Chicago we have long since become familiar, and Chicago is but one of the many other cities "out West" that, within considerably less than a generation, have been, so to speak, called into existence. In the older States the same changes have been effected. Boston is no longer the Boston of thirty years ago, when first we saw it, not much unlike the old town of ante-independence days, which Fenimore Cooper has so well described. Providence, Rhode Island, was a village then, and now possesses one of the largest hotels in America; and many another quiet old half-English town that smacked strongly of the days of British rule, and even of those when the "bulbous-bottomed burghers" of Washington Irving's ever-genial and amusing history, smoked their long pipes under the shadow of old trees, or of their own scarcely less umbrageous broad-brimmed hats, outside their old red-brick, crow-stepped gabled Dutch farm-houses, the last of which, by the way, disappeared from New York not so very long since.

Thirty years ago Washington presented all the appearance of a charming old colonial village, the chief houses of the officials, the old residents, and the best hotels being low houses, many of them built, like the Anglo-American houses of that time, of wood, comfortably surrounded by their verandahs, and in most cases embowered in shady trees, like the famous house of the Spanish ambassador, Calderon de la Barca, the husband of the still more interesting Madame de la Barca,—a Scotchwoman and the authoress of a work on Spain that, by this time, must, from circumstances known doubtless to many collectors, be one of the very rare books for which America and Americans are now giving such enormous prices. Our own ambassador at the same time, Sir Philip Crampton,—one of whose unpaid *attachés* was then the present Earl of Lytton, since Governor-General of India,—lived also in a delightfully shady house over-looking the Potomac. Those were days when a few minutes' walk or drive brought one into what appeared to be the remote recesses of a primæval forest.

Since then, and of course since the War of Secession, building interests in Washington have been somewhat active. Young men who have grown up in Washington within the last thirty years regard it, even after visiting the Continent, as a second Paris. As it was when we first saw it, its appearance was almost, with the exception of the Capitol,—then not a fourth of its present size,—and one or two other public buildings, the Smithsonian Institute among the number, like Tunbridge Wells, or some such other cool retreat. What the "White House" was then, it still is, though what the "White House" of the future is likely to be, Americans alone, with the assistance of the architectural learning of Europe, can determine.

As a natural consequence, the enormous increase in the number of residences that are being built in Washington, New York, and elsewhere, will have the immediate effect of enlarging all the Northern summer resorts. Washington, particularly, being blessed, or cursed rather, by a climate that makes it like many other American cities, an unendurable summer residence for all but the now happy negro population, and those unhappy Government officials, whose felicity alone consists in the obscurity of their positions allowing them at least the indulgence of the pleasure that comes with the security of permanent appointments; but even the Government clerks, those who do not go out at the end of every four years, are obliged to get away during a month or two of the hot season, and away they rush to those delightful resorts, if not to the North and the sea-side, to the White Sulphur Springs and the Sweet Sulphur Springs in the mountain ranges of Virginia, where, thirty years or so since, there existed a society from the South, that would have been a sufficient attraction without the natural advantages afforded by the delightful springs themselves and the cool shade of the surrounding woods.

A LITTLE MORE ABOUT DRAGONS AND ANGELS IN ART.

ALTHOUGH the name "dragon" is sometimes applied to any gigantic and formidable reptile, there can be little doubt that the normal type of the Mediæval dragon was a winged monster. We may cite the authority of Linnæus, in the name he gave to a lizard, which, though not furnished with true wings, has a pair of membranous expansions on its sides, which sustain the creature in a leap through the air, the *Draco volans*. Before the time of Cuvier, the specific name given to this small lizard may be said to have represented the only link that existed between the science of the naturalist and the dragons of mythology. But palæontology had not advanced very far before it taught us that a winged reptile was not an imaginary creature, but one that ranked among the extinct forms of life that once inhabited our planet. The pterodactyl, or wing-finger, was a true flying reptile, of fiercely predacious and carnivorous habit,—as formidable an assailant in the air as the crocodile, a survival of the numerous water dragons of the herpetiferous strata, is in the water. The discovery, so late in the course of time, of the fact that the winged dragon has been an undoubted denizen of our planet, leads to the question whether any form of pterodactyl, or of other winged reptile, lingered until historic, or at least until human times. Invention is rarely original; and for a truly original invention to turn out to be a true description of something wholly unknown to the inventor, is a phenomenon as yet unknown. It may be said that the winged dragon of mythology is not identical in the arrangement of its wings with the pterodactyl. Were we to see that creature in life, however, it is hardly probable that our attention would be riveted on the articulation of its wing-bones. Still less is this likely to have been the case in those earlier times when all that was known of anatomy was derived from observation of wounds in battle. Of course, no one is in a position to assert dogmatically that the mythical dragon is really a tradition, not an imagination; but the subject is not unworthy of consideration. The accounts, some of which are indisputable, of the sea-serpent, have been thought by some naturalists to denote the survival of some rare specimens of the plesiosaurus, a contemporary of the pterodactyl. Unless the creature be an enormous conger,—of the limit of age and size of which creature we have no positive knowledge,—we seem to have little choice but to regard it as some rare and all-but extinct saurian. Such might have been the sea-dragon from which Andromeda was rescued by Perseus. The dragon depicted by Moritz Retz as devastating Rhodes comes within historic times; for Diendonné de Gozon, the young knight who slew the monster, according to the legend, is known to have been a Grand Master of the Order of St. John of Jerusalem. Hence there seems to be a nucleus of truth in the legend, though it is possible that the dragon in question was an enormous snake.

The power of transformation, or the phenomenon of attaining, at a certain age, a form unlike that worn at birth, which is characteristic of the class *Insecta*, is found among one great group of reptiles; although that is a group widely differing from the Saurians, or dragons. It is that of the Batrachia, or frogs. In the spring of 1880 we witnessed a spectacle that was perfectly new to us,—that of a number of little frogs, in a garden pond, hopping merrily before they had lost their tails. They were like little efts,—or rather like little crocodiles, with four well-formed legs and long tails, but had exchanged the movement of the tadpole for that of the frog. Generally, we think, the tail becomes absorbed before the creature leaves the water. The cuirassed pirates of the ancient oceans are represented, to a certain extent, by another reptile family, the Chelonia, among which one, called the snapping turtle, which is something like a snake furnished with a carapace or shell, into which to retreat, is a very formidable carnivore. The magical power of transformation possessed by one reptile group may in old times have added to the uncanniness of reptiles as a class. Poetry and art have been in accord in giving reptile characteristics to the personification of the Power of Evil. It is possible that the terror caused by the subtle movement, enormous strength, and (occasionally) fatal venom of some of the great ophidia, or snakes, may have led to that association. Yet if there be any form which is more unlikely to be provided with wings than another, it is that of the serpent. We cannot pretend to assert that the wings of the Mediæval dragons have any other origin than the imagination. But it must be confessed that the discovery, so long after the form of the winged dragon had become conventionalised in art, of the remains of actually winged dragons, forms a subject worthy of further consideration.

As to angels, it may be added to what has been already said in these columns, that it is remarkable that no word corresponding to our ordinary idea of an angel exists in ancient Semitic literature, although there are twelve words that are occasionally used, as now understood, to denote celestial messengers or intelligences. So fully, however, is our first remark justified, that we find the rabbinical writers positively transliterating the Greek or Latin *angelus* or messenger into the barbarous form *angla*. Among the words of ordinary meaning, applied in a special sense to designate supernatural beings, are not only the well-known Cherubin and Seraphin, Thrones, and Powers, but the words men, gods, sons of god, sparklers, watchers, wheels, and beasts, or living creatures. We spare our readers the cumbrous Aramaic forms. A considerable amount of angelology had been compiled before the date of the close of the Gemara, about 500 A.U. Thus we hear of Duma, the angel of silence; Yurek, the prefect of hail; Yohach, the angel of travel; Lajelah, the angel of child-birth; Asariel, the prefect of the waters; Suriel, the prince of the Divine Presence; Gabriel, Uriel, Raphael, Michael, Zadkiel, Hanael, and Cassel, the angels of the Seven Planets. The most terrible name in the shadowy host is that of Samael, the prince of the air, a malignant angel, who is sometimes identified with the planet Mars. Asmodai is another evil name, whether applied to the same impersonation or not is questionable. Argentin, the prefect of baths, seems to denote by the name a Latin origin, though the word is found in Aramaic.

It is tolerably clear from this brief abstract of a somewhat extended study of the subject, that the Semitic imagination, however much indebted to Persian or Assyrian influence, ran riot in the regions of the invisible quite as much as did the Latin fancy. The prohibition to represent animal forms, however, has had the result of confining the knowledge of the Semitic angels to the few students of this literature. Among the Latins, on the contrary, the few types that have been embodied in stone, or depicted on canvas or on glass, have survived the literature which gave them birth, and still tell, in many a shadowy nook of ancient church or cathedral, of the visions of horror or of beauty in which the imaginations of our ancestors were wont to indulge.

THAMES BRIDGES.

THE course of a few years will make an immense difference in the aspect of many of the bridges over the Thames. At Putney the right line of the road will be restored; the hideous aqueduct that now crosses the river (in that line) will be removed, as well as the tottering and decaying pile of the old wooden bridge, and a stately granite structure, built at a large cost, will provide for both road traffic and water conduit.

At Battersea, we now learn that an iron bridge of five spans is to replace the seventeen apertures of the old wooden structure. The centre span will be 173 ft. wide, with a height in the centre of 15 ft. above Trinity high-water mark, which is 6 ft. more than the present clearance. The width of the roadway will be 40 ft., instead of the present 23 ft. The estimate of 231,000*l.*, if verified by the construction, does not appear an out-of-the-way one for this great architectural improvement as one mode of crossing the Thames at Battersea. We may add that it is to be hoped that the new line for which the London and South-Western Railway have obtained a Bill, will enable the traveller to get from Guildford to Chiswick in less than two hours and a half.

Highbury Institute of Art, Science, and Literature.—The committee has succeeded in passing the candidate for Advanced Building Construction at the South Kensington Examination. The winner of the certificate is Francis J. Bancroft, a junior in the Highways Department of Islington Vestry. This speaks well for the instruction given by the drawing-master, as the questions are difficult ones to answer by a student of seventeen.

INTERNATIONAL MEDICAL AND SANITARY EXHIBITION.

THE OPENING CEREMONY.

THE proceedings in connexion with the opening of this Exhibition took place in the Royal Albert Hall on Saturday afternoon last, the President, the Right Hon. Earl Spencer, K.G., Lord-President of the Council, in the chair. There was a large attendance of ladies and gentlemen.

Earl Spencer said he owed the honour which he had of presiding over that meeting, firstly, to the fact that the illustrious patron of the Exhibition, H.R.H. the Duke of Edinburgh, was away with one of Her Majesty's fleets in the Baltic; and, secondly, in all probability, to the fact that he was now at the head of a department of the Government from whom some of the galleries in which the Exhibition was arranged, were held. He belonged to that department of Her Majesty's Government to whom were referred any large questions touching medical education in this country, and he had lately felt the great responsibility of his position, by having assigned to him the difficult task of appointing a commission to consider a subject of great medical importance to this country,—a commission which he hoped would lead to changes in the law with regard to medical education which would be greatly conducive to the welfare of the community. He should not detain the meeting very long by the few remarks which he thought it to be his duty to offer on that occasion. He could not help referring to the great improvements which had been made during the last fifty years in sanitary matters,—improvements which had tended so greatly to improve the health of the community. Such improvements had been a necessary condition of the development of the resources and wealth of the country. The health of vast masses of the population had been beneficially affected by public works of reclamation which were now to be seen in all parts of the world. Marshes from which used to spring fatal agues and malaria were now to be seen converted into fruitful and wholesome fields and farms. Such improvements as those to which he was referring had removed one of the great impediments in the way of the health, and therefore of the wealth, of the community. Other public works that had been carried out, such as the drainage, lighting, and water-supply of our towns and villages all over the kingdom, and, last though not least, the improvement of the dwelling-places of the people, had been no less beneficial in their results. All the improvements he had mentioned had, he ventured to think, exercised a vast influence on the health of the community, and those who were engaged in the Legislature of the country were from time to time brought into contact with facts which showed that to be the case. Again, very many of those who were connected with the work of local government, or with the management of private property, had largely given attention to the work of sanitary improvement in the directions he had indicated. But, while referring to what public men, people connected with local government, and managers of private property, had done and might do for the good of the health of the community, he must not forget to make special allusion to the energy, ability, and activity of the members of the great medical and surgical profession. He ventured to think that, during the last fifty years, the greatest possible improvements had been made in the way in which the members of that distinguished profession had carried out their work. They had availed themselves of the appliances of modern science, which they used for the alleviation of pain and for the promotion of the health of the community. He was glad to be able to refer to one proof that such efforts had not been wanting in success in achieving the desired end, at any rate in this country. It was only the other day that a colleague of his, in presenting to Parliament the preliminary abstract of the Census just taken of the population of the United Kingdom, referred to a fact upon which he thought they might all congratulate themselves very much. He referred to the fact that the death-rate of the kingdom during the last ten years had most notably decreased,—to such an extent, indeed, that during the last ten years 300,000 lives had been saved, which would have been lost had the death-rate of the preceding decade continued. Without doubt, that diminution in the death-rate was largely due to improved sanitary conditions. He believed that the Exhibition which the meeting was met to open would be of great value by bringing together the experience of the medical men, architects, and sanitary engineers not only of this country, but of every part of the world. That, he thought, would be a great advantage to all those who had the health and prosperity of the people at heart. He believed also that the value of the Exhibition would be greatly enhanced by the international congress of medical men, which was shortly to be opened. That congress would no doubt also have an important bearing on the Exhibition. The Exhibition, he might add, was divided into two classes or departments, the Medical and the Sanitary. Those who were specially interested in or identified with the medical profession would find in the Medical Department all the newest surgical inventions and appliances, and all other matters which would conduce to the well-being of those who had to undergo painful operations, or who had to endure sickness of any kind. There was also exhibited almost every drink recommended by the faculty, from Apollinaris water to decoctions of the bitterest drugs known in medicine. The visitor to the Sanitary Department of the Exhibition would, he was sure, be struck by the infinite scope and breadth of that part of the display. There would be found there not only all the best models of house drainage, both internal and external, but illustrations of all the best systems and appliances which had been devised for the drainage of towns and villages. There would also be seen almost every conceivable appliance, from the best means of warming and ventilating a house to the best kitchen stoves and utensils. There were also to be seen the best and most wholesome means of house decoration in lieu of poisonous wall-papers. In short, every conceivable sanitary material and appliance was to be found in the Exhibition, and everybody who was building or furnishing a house, whether a mansion or a cottage, would be able to see how very much the appliances and fittings of a house contributed to the health or illness of its occupants. To neglect the teachings of sanitary science was to encourage sickness and ill-health On the other hand, adherence to the soundest and wisest principles of sanitation in the fittings and arrangement of a house could not but conduce to the health of those who lived there. He most heartily wished the Exhibition every possible success. He wished it success not only at the present time, and during the time it continued open, but a more permanent success, and he sincerely trusted that it would enable those who had the management of that admirable institution, the Parkes Museum of Hygiene, to put that museum on a permanent basis. The Museum bore the name of a distinguished man, a leader in the work of hygienic reform, and he trusted that the efforts which were being made to give it a permanent home worthy of it would be crowned with success. Without saying anything further at that moment, he would call upon Dr. Poore, the hon. sec. of the Parkes Museum, to read a statement explanatory of the origin of the Exhibition.

Dr. G. V. Poore then read the following statement:—

"MY LORD,—As the honorary secretary of the Parkes Museum of Hygiene, the duty devolves upon me of stating briefly the origin of the International Medical and Sanitary Exhibition, which is inaugurated to-day.

The Parkes Museum, which was formally opened on June 28th, 1879, by Sir R. A. Cross, G.C.B., has clearly met a great public want. It has been opened gratuitously to the public on three days in each week, and the number of visitors, which amounted to 2,166 in the first year of its existence, increased to 2,540 in the year which has just closed.

The practical lectures which have been delivered to artisans, workmen, and others, have been attended by numbers which have steadily and progressively increased, so that latterly they have been in excess of the accommodation which the museum in its present situation is capable of affording.

Thus encouraged, the Executive Committee thought that a successful attempt might be made to organise an exhibition of sanitary appliances on the occasion of the assembling in London of the International Medical Congress. This idea was received with approval on the part of the officers of the Congress, and in order that the exhibition might have an additional interest for our medical guests, it was resolved to make it representative of Medicine as well as of Hygiene, and it was finally decided to include in it anything which might reasonably be considered of use in the prevention, detection, cure, or alleviation of disease.

A sub-committee of the Executive Committee of the Parkes Museum was appointed, with power to add to its number any persons likely to forward the interests of the exhibition, and the Exhibition Committee, as finally constituted, consisted of Mr. Erichsen (the late president of the College of Surgeons) as Chairman, the president of the Pharmaceutical Society, a professor of hygiene, two physicians, three surgeons, three architects, and two engineers, with a surveyor, Mr. Judge, as secretary.

The labours of this Committee have been considerable, but they have been much lightened by the sympathetic co-operation met with on all sides.

To the Royal Commissioners for the Exhibition of 1851, to the Council of the Royal Horticultural Society, to the Science and Art Department, to the Director of the South Kensington Museum, and to the President and Officers of the International Congress, their thanks are especially due.

The Exhibition Committee are proud to be able to state that His Royal Highness the Duke of Edinburgh has graciously consented to become the Patron, and that the Lord-President of the Council has courteously accepted the office of President of the Exhibition.

The Executive Committee of the Parkes Museum, while they have every reason to feel satisfied with the work which they have accomplished, are not without anxieties for the future. The present home of the Museum is daily becoming more inadequate, and the funds at their disposal are barely sufficient to pay the very small current expenses. Their ambition is to permanently establish the Parkes Museum in a building of its own, and they are not without hope that the International Medical and Sanitary Exhibition may be the means of directing public attention to the needs of the parent institution. Should this Exhibition prove financially successful, the profits will be handed to the treasurer of the Parkes Museum, and it is hoped that the knowledge that one of the ultimate aims of the Exhibition is to assist in the permanent establishment of the Parkes Museum, will prove an additional incentive to the public to visit the International Medical and Sanitary Exhibition."

Mr. Mark H. Judge, secretary of the Exhibition Committee, read the following report:—

"My Lord President, my Lords, Ladies, and Gentlemen,—The brief statement I have the honour to make to you on behalf of the Exhibition Committee must, I think, gratify both the exhibitors and the public generally, since it clearly shows that the interest taken in this, the first International Exhibition of its kind, has been of an eminently practical character.

It was natural that the committee should count upon receiving the co-operation of their own countrymen in an undertaking which could not fail to benefit this country, but they could hardly have expected the large amount of support that has come from the people of other countries.

The exhibits are divided into seventeen sections, and they represent almost every industry connected with Medicine, Architecture, and Sanitary Engineering. One feature specially worthy of mention is that the work of artisans is exhibited by themselves.

Besides the exhibits which have been contributed by London, Dublin, Edinburgh, Glasgow, Liverpool, Manchester, Birmingham, and other large towns in the United Kingdom, the following countries have sent contributions, viz.:—France, Germany, Austria and Hungary, Italy, Switzerland, Turkey, Holland, Belgium, Norway and Sweden, Bohemia, Bavaria, India, and America.

Thanks to the heartiness with which the exhibitors have fallen in with the arrangements made by the committee, the exhibition that you have been invited to inspect to-day is not in an unfinished condition, but is full and complete.

It was at first intended that the judges of the different sections should make their awards to the exhibitors on the opening day, but the extent of the exhibition has made it necessary for them to prolong the time for their examinations, and therefore the awards will not be made until next week.

The public spirit shown by the subscribers to the Guarantee Fund should not be overlooked, as without this the committee could not have ventured on an undertaking of such magnitude.

With such an inaugural meeting as the present, there can be little doubt that this exhibition will be the means of providing a considerable sum for the Parkes Museum, and at any rate it is sure to stimulate invention and improvement in all that relates to health."

The Right Hon. Earl Granville, K.G., said that at a time such as that, when London was so full of business and of pleasure, the presence of so many ladies and gentlemen as he saw before him was a very clear indication of the interest which was excited by the objects of the Exhibition,—objects so very wide that, as Lord Spencer had described them, they included house drainage, architecture, engineering, furniture, food, clothing, and the prevention of disease. He must admit that when he received his card of invitation to attend the meeting, and found insidiously inserted on the back of it that he was expected to deliver an address, and that he was to be followed by Sir James Paget, his heart sank within him; but he had been somewhat relieved by the fact that the two excellent reports which had been read, and the singularly clear and lucid statement of Lord Spencer, left him very little to say. Perhaps the committee, in inviting him, were desirous of imitating the practice that now obtained in some of our theatres. The managers of those establishments, desirous of meeting the requirements of those who came early and liked a quantity for their money, and of those, on the other hand,

who liked to dine comfortably before the evening's amusement, advertised the great piece of the evening to begin at eight o'clock, and in smaller letters on the bills they announced that some trifling play would be enacted before it, so as to amuse the early-comers, and to whet their appetite for the chief performance of the evening. In the same way, he supposed he had been invited to speak in order to whet the appetite of the audience for the address of Sir James Paget He thought it was Dr. Parkes himself who defined hygiene as the art of preserving health,—in other words, the art of giving the most complete action to the mind and body for as long a period as was consistent with the laws of life. All people, sometimes voluntarily, sometimes involuntarily, thought and talked of health; and he ventured to say that if anybody were rash enough to admit in company that he had some indisposition, he would find the majority of those present eager to prescribe for his diet and his regimen, everybody having some favourite pills to recommend. He remembered some years ago having a severe attack of gout while in Rome. As soon as the news spread he was immediately inundated with prescriptions, not only in English, but in Italian, French, German, and even Russian. The Cardinal-Secretary of State was good enough to tender him some advice based on his own personal experience; another foreign minister gave him exactly contrary advice; and such was the happy result of that combination of prescriptions that he did not get well until he had left the grand old city behind him. In Easter of the present year,—it being a dull season with the newspapers,—a report was published that he had a serious attack of gout. It was a subject very unworthy of attention, and, luckily for him, the report was entirely without foundation, but nevertheless, he had been most deeply touched since that announcement by the receipt, daily and even hourly, of letters of advice upon that, to him, interesting topic. He had been advised to drink whisky, he had been advised to drink claret, he had been advised to adhere to the most rigid teetotalism, he had been advised to live generously, and he had been advised almost to starve himself; while one gentleman, whom he had no reason to suspect of being a dentist, advised him to provide himself with a complete apparatus of artificial back-teeth. The moral he gathered from all that, was that even for maintaining the health of a single individual, study alone, or experience alone, was not sufficient. He believed that they required science, art, and experience combined to be of use in such matters. Now, if that was the case with regard to the health of an individual, how much more was it so with regard to the health of large communities! Lord Spencer had referred to some very satisfactory statistics gleaned from the recent census. That census showed how the population of this country was increasing. With regard to the metropolis alone, the numbers very nearly approached the enormous total of four millions! Many of those present would remember the observations of Archbishop Whately with regard to the great problem of affording food to such agglomerations of human beings occupying a comparatively small area. How easily the work of providing such vast masses of men, women, and children had been done by their fellow-beings, prompted by self-interest, and how impossible would it be for the Government to do such work efficiently and without enormous waste! But, besides air and food, there was water,—which was a prime necessary of life, whether for drink, for purposes of cleanliness, or for its use in antagonism to fire. That was a thing which could not be in all cases effectively provided by private enterprise. If it were to be provided either by the Imperial Government or by local authorities, it ought to be on the best possible principles both as to quality and as to the quantity of the supply. He considered that in this great city of London we were most imperfectly provided with water. The question was one beset by difficulties, and was one among others in which specialists could do much, by the dissemination of sound principles, to develop a healthy public opinion. He believed that exactly the kind of sanitary information which was desired would be furnished by the Exhibition about to be opened,—an exhibition which was the outcome of the Parkes Museum of Hygiene. Her Majesty's Government were perfectly alive to the importance of sanitary questions. The meeting would be aware of the causes which had made the present session so barren of legislation on questions of that kind. He was happy to say, however, that there was one measure with regard to the flooding of rivers,—a matter which bore most essentially upon the health of many towns and villages,—which had been got to such a stage that the Government had a very strong hope of being able to pass it into law this session. He knew that the path of the sanitary reformer was not always a smooth one. The subject itself in some of its details was of a disagreeable character. There were many obstacles to the progress of sanitation, as such veteran reformers as Mr. Chadwick could testify, including vested interests,—or fancied interests,—in many forms. Of one thing he was quite sure, namely, that the friends and fellow-labourers of the late Dr. Parkes would feel that their reward would be ample if, through creating the Parkes Museum as a memorial of his connexion with University College, and in commemoration and perpetuation of his untiring devotion and great services as a sanitary reformer since the time of the Crimean war, the Exhibition which was the outcome of that Museum should be the means (as it was likely to be) of greatly increasing the interest of the public in sanitary matters. It was a happy idea to have held the Exhibition during the visit of about 600 medical men from all parts of the world. The International Medical Congress would be attended by some of the most eminent medical men in the world, and he had not the least doubt that the result of their deliberations and of the teachings of the exhibition would be the dissemination of much useful information as to the laws of health, and that such information would be immensely conducive to the well-being, not only of the bodies, but of the minds and characters, of their fellow-creatures all over the world.

Lord Spencer explained that the Right Hon. J. G. Dodson, M.P., who had promised to be present if possible, had been prevented from attending owing to the pressure of important official duties.

Sir James Paget said he should not have ventured to address the meeting,—which was essentially a meeting for the opening of the Exhibition,—but for the relation which had been mentioned as subsisting between the Exhibition and the International Medical Congress. It was in the first instance suggested that the organisation of such an Exhibition would be a proper part of the duties of the executive committee of the International Medical Congress, but for various reasons it was decided that the work of organising the exhibition should not form part of the duties of the Congress Committee, who felt that they would have enough to do without undertaking the great amount of labour that the organisation of such an exhibition involved. What had been achieved by the Exhibition Committee was enough to prove that the Congress Committee were right in leaving the Exhibition in the hands of a separate committee, who had devoted an amount of energy to the work which would have been quite beyond the power of the Congress Committee, although the latter were served by that most admirable of general secretaries, Dr. MacCormack, to whom, if the Congress was successful, as it could hardly fail to be, more than nine-tenths of the credit of such success would be due. The results shown by the Exhibition Committee, in the number and variety of the appliances and materials exhibited, were beyond what the most sanguine promoters of the Congress could have dreamt of. It was an Exhibition of which he believed the country might well be proud and one which would be fraught with instruction and pleasure to the distinguished foreigners who would visit it in connexion with the Congress, and who would find much in it not only to criticise and to advise upon, but to admire and learn from. Although we in this country might justly be dissatisfied with the present hygienic state of England,—and, he might add, they were proud of their dissatisfaction, for there was no ignorance so dangerous as that which was supported and perpetuated by self-satisfaction,—yet we had very much to show for the results of the teaching of sanitary science in the country during the last few years, thanks to the intelligence and industry of a comparatively small band of sanitary reformers. Lord Granville had mentioned with commendation the name of Mr. Edwin Chadwick, but he might add to that a long list of names, beginning with that of Mr. Simon. He might also refer to the great mass of knowledge on sanitary matters now in possession of the Local Government Board,—knowledge collected by its army of medical and engineering inspectors, and not to be surpassed in extent or value by that gained in any country in Europe. The difficulty was in applying all that knowledge,—in always doing exactly the right thing under ever-varying circumstances. He thought it was a good omen for the success of the Exhibition and Congress that the Lord-President of the Council was in the chair on that occasion, because he represented that which he believed would be the best work that the Exhibition could do, viz., the work of educating the public in sanitary matters. Presiding, as his lordship did, not only over medical education, but over every branch of education in the kingdom, he did well to recognise that one of the prime objects of the Exhibition and of the Parkes Museum of Hygiene was the education of the public in sanitary matters. He (the speaker) could himself be no efficient judge of the comparative merits of the different preventive appliances that were exhibited, because his life had been spent in trying to mitigate the miseries that resulted from the want of the prevention of disease. No doubt the work of preventing disease was a much happier task than that of trying to cure it. The medical man had very much to be thankful for in the advance of sanitary science. It was a great assistance to him to know that, owing to advances in sanitation, he need not, under proper precautions, fear the spread of infection from one patient to another, and that he need not fear that his skill would be thrown away owing to the foulness of a hospital drain; but that, aided by the art and science of nursing, and the recognition of sanitary laws, his patients now had everything in their favour, and that the curative means he employed would have fair play. Such exhibitions as the one which they were assembled to open must do much to promote a knowledge of sanitation. Amongst the exhibitors themselves, a wholesome rivalry in the attainment of what was as near perfection as possible was set up. Mutual criticism of each other's appliances was likely to bring out the weak and the strong points in such things, — and perhaps the exhibitors looked at each other's goods with keener eyes for defects or improvements than were possessed by the judges of the awards. A spirit of emulation was set up, and the public, in the long run, were the gainers. Another important feature of such exhibitions was their educational effect on the masses of the people. People who visited the Exhibition would learn something about the principles of sanitation, and could exert an influence in favour of sanitation amongst their friends and neighbours, but more especially amongst the poorer classes. He wished it could but be once strongly impressed upon the people, by some strong and lucid speaker, how very completely the wealth of the country was dependent upon the health of the population. The wealth of a country such as England depended in only a very secondary degree upon its climate and its soil, its mines and its industries. Its agriculture and its industries depended far more upon the will and power of its people to work, and such power depended upon strong minds and strong limbs, and these, in their turn, were dependent upon and could not exist without health. In this country, therefore, health was pre-eminently wealth, and he who did not do all he could to promote his own health forfeited his right to wealth, and was guilty of the basest want of patriotism. There was one thing quite certain and fully recognised in Medicine, viz., the relation between constitutional and local disease. Nothing was more clear than that local diseases sooner or later affected the whole body. In the same way, one unhealthy neighbourhood, one plague-spot, often infected a whole district, and one district infected another, until the whole tone of life all over the country was sensibly lowered. Knowing this, then, he wished most cordially success to the Exhibition. If he had one other reason why he wished it success, it was that he reverenced the memory of Parkes, and he therefore hoped that the success of the Exhibition would be such as to help in placing the Parkes Museum of Hygiene on a more permanent footing, seeing that that institution sought to perpetuate the work to which Parkes devoted the best years of his life.

The Chairman.—It is now my pleasing duty to declare the International Medical and Sanitary Exhibition open.

Mr. George Godwin, in moving a vote of thanks to the Right Hon. Earl Spencer for presiding, said the resolution which had been

put into his hands was one which needed no commendation or argument on his part. He had proposed to himself to make a few observations on the general subject before speaking to the resolution itself, but he was now afraid to do so lest he should weaken the effect of the very eloquent and admirable address which they had just heard from Sir James Paget. Nevertheless, as representing the Executive Committee of the Parkes Museum of Hygiene and the Executive Committee of the Exhibition, he would venture to add a few more words, as earnest as he could command, to introduce to the attention of the meeting, and to urge the claims, — he had almost said the paramount claims,—of the Exhibition upon the attention of the public and the Press. A very considerable advance had taken place in public opinion on the subject of sanitation since, many years ago, a few earnest men began the work of sanitary reform; but he was afraid, that even at the present time there existed scarcely so agreeable a state of things as might be supposed from the tone of the speeches which had been delivered. Sanitary reform was a matter which still failed to excite a due amount of interest,—one which was still too much neglected. It should be remembered by all that it was not a question of rose-water, or of strains from Hungarian bands, pleasant as such things might be. It was a question of health and happiness,—a question of life and death, and a question on which every man,—aye, and every woman too,—had it in his or her own hands to exercise an influence for good or evil. The object of the Parkes Museum had been, and continued to be, to disseminate generally the truths of sanitary science, and also to show,—what the Exhibition just declared open showed on a larger scale,—the best appliances that could be had for practically applying those truths or principles. It would have given him very great pleasure to have commented upon some of the points suggested by the Exhition, but opportunity did not permit, though there was one matter to which he would direct attention as illustrating its value in relation to some statistics which had recently reached him. The statistics to which he referred were of especial value in connexion with the plans which were exhibited for the arrangement of hospitals and other institutions of the kind. It appeared to be a well-ascertained fact that the French soldiers who were wounded in the Crimean War, and who were subjected to surgical treatment, died at the rate of 75 per cent. In the American Civil War, on the other hand, the soldiers, who sustained quite as severe and as dangerous wounds as those sustained by the French soldiers, and who were treated with certainly not greater surgical skill than the latter, only died at the rate of 34 per cent. What was the reason of the mortality amongst the American soldiers being less than half that amongst the French soldiers? Simply because the French soldiers under surgical treatment were placed in old-fashioned and badly-contrived hospitals, without any proper arrangements for ventilation and drainage, whereas the American soldiers were placed in single, detached, and even rudely-constructed separate buildings, in which air had free circulation, and good drainage was practicable. In some of our own hospitals there were surgical wards, which were simply places for dying in, and the surgeons knew it, and were helpless. The state of things existing in the houses of the very poor in London and other large towns of the kingdom was still deplorable. It was true that many great improvements, materially lessening the death-rate, had been effected, but still the story of sanitary neglect in the present day was appalling, and called for the paramount attention of every man deeming himself a statesman. He did most sincerely hope that when present difficulties were overcome, her Majesty's Government would evince a great and proper interest in the vital subject of sanitary reform, and that they would press forward necessary legislation on the subject. If the people of this country, especially women, would only make themselves acquainted with the good that flowed from the observance of sanitary laws, and would insist upon their observance, the amount of benefit that would be effected would be greater than could be imagined. He was sure that the meeting was very much pleased with having had Lord Granville and Lord Spencer with them on that occasion, and it was his most pleasing duty to propose that the best thanks of the meeting be given to the Right Hon. Earl Spencer for presiding at the meeting and for so eloquently advocating the objects of the Exhibition.

Mr. J. Eric Erichsen, F.R.S., said that as Chairman of the Executive Committee of the Exhibition, it gave him very great pleasure to second the vote of thanks. The Exhibition was the joint offspring, as it were, of the Parkes Museum of Hygiene and of the International Medical Congress, which was to hold its first meeting in about a fortnight from the time he was speaking. Thus the Exhibition, by some law which was unknown to natural science, had come into the world before the birth of one of its parents. It had, however, strange to say, inherited the good qualities of both of them, for on one side it represented in its full integrity all the wealth of hygienic appliances to be found in the Parkes Museum, and, on the other hand, everything that could minister to the relief of suffering and the cure of disease, and that could promote the alleviation of deformity and infirmity as it affected man. He could truly say that it was a great Exhibition, for it was the greatest of the kind that had ever been got together. It was the natural outcome of the advance of hygienic science which had characterised modern life, for if there was one characteristic of modern life more than another, it was the great attention paid, at any rate by the educated classes, to the study of the laws of hygiene. The civilised man differed from the savage, and the educated man from the uninformed man, in nothing more than in the scrupulous attention paid to cleanliness in all that related to the health of the body and to the surroundings of the home. The civilised and educated man was impelled by his culture to be clean, and it had become an instinct with him to be so. His knowledge told him that disease was largely preventible by the observance of cleanliness, and that, if preventible and not prevented, it was truly self-inflicted. Disease that was self-inflicted was not always of the major kind. Not merely typhoid and small-pox, but the lassitude, the languor, and nervous depression which were so prevalent were frequently found to have their source in faulty hygienic conditions. The law of hygiene was like the moral law. Just as an infraction of the moral law might lead to the pricking of conscience, so a breach of hygienic law led to illness. He was very glad to hear Mr. Godwin allude to the great influence which might be exerted by women in connexion with hygienic reform, because it was to women we must look for the exercise of home influence. Women should be our great hygienists. It was to the wife, not to the husband, to the mother, not to the father, that we must look for the preservation of hygienic conditions in the home. It was to the mother, not to the father, that we looked for the prevention of disease among the children, and for the adoption of those hygienic measures which would lead the children to grow in vigour and health, strength and beauty, and fitted in body and mind for the duties of after-life. He seconded the resolution with much pleasure.

The resolution on being put to the meeting was carried with much applause.

Earl Spencer, in reply, said he thanked the meeting for the very hearty way in which they had received and adopted the motion for a vote of thanks. His services on that occasion had been very slight, but he felt it to have been a very great honour and pleasure to have assisted at the meeting, and he wished most cordially success to an Exhibition which was calculated to have so very material an influence on the health of the country.

The audience then passed from the Albert Hall to the Exhibition galleries.

SOME APPLIANCES AND MATERIALS AT THE MEDICAL AND SANITARY EXHIBITION.

THE exhibition of which we have in preceding columns reported the opening meeting is so large in scope, and contains so many appliances and materials, that we cannot do more this week than notice a portion of the exhibits. The Sanitary Section of the Exhibition occupies the Eastern Quadrant and the Eastern Arcade of the buildings which, with the large conservatory behind the Albert Hall, enclose the Royal Horticultural Gardens on three sides,—the Medical Section occupying the Western Quadrant, the Western Gallery and Arcade, and part of the Albert Hall. For convenience we now deal with the exhibits contained in the Eastern Arcade, beginning at the northern end.

Messrs. Tonks & Son (Stand 242) are exhibitors of a variety of useful door and window fittings, ventilators, and blind furniture, applicable to hospitals and buildings of all kinds.

At Stand 247, Messrs. J. Bolding & Son exhibit a valve-closet with the overflow made to discharge on to the safe, and thence away over an open rain-water head or trapped gulley. Other closets are shown in action by this firm, including Mr. Banner's improved form of pan-closet made entirely of white earthenware, and which can be readily taken to pieces so as to inspect or clean the container, the interior surface of which is, however, flushed each time the closet is used. At this Stand, Messrs. Graham & Fleming exhibit some remarkably good specimens of plumbing work in the form of soil-pipes and traps. With a view to prevent syphonage of closet-traps where more than one closet is connected to an upright stack of soil-pipe, the latter is bulged so as to considerably increase its diameter at each point where a branch or arm from a closet enters it.

Mr. G. E. Pritchett, F.S.A., architect, exhibits at Stand 248 his patent hot-water system for economising heat and fuel. Corrugated double metal plates are formed with an interval between them for the circulation of water. These plates have a large heating surface, and as they occupy very little space compared with round pipes, they can be fixed without inconvenience behind dadoes and in other positions where pipes would be inadmissible. A full-sized section of the wall of a room with Mr. Pritchett's method of warming and ventilating applied is exhibited in action, and will repay examination by visitors. Mr. Pritchett claims to obtain a *maximum* of warming power, while reducing the expenditure for fuel to a minimum.

Messrs. Thomas Waller & Co. (Stand 249) exhibit a water-closet fitted with an inner pan rim for the prevention of draughts. The space beneath the seat is ventilated, and when the inclined lid is shut down, the pan itself is ventilated into a fine passing up through the wall. This firm are also exhibitors of grill apparatus for chop-houses and hotels, gas-roasters, and other cooking apparatus, including a 9 ft. 6 in. close range. Ventilating and warming appliances are also a specialty of this firm.

Perhaps the largest space occupied by any one exhibitor is that which has been secured by Messrs. Steven Bros., who at Stand 250 display a fine collection of ranges and cooking apparatus, embodying many great improvements, and eminently worthy of the attention of architects and proprietors of large establishments. This firm's Roman bath, in cast iron, enamelled, finished on the outside so as to render casing-in unnecessary and undesirable, is also shown by them.

Messrs. Walter Macfarlane & Co. (Stand 251) have a notable display of goods in cast-iron, including a circular urinal of new and ornamental design, "silverised" screens for various purposes; drinking fountains and horse and cattle troughs of ornamental design; trough closets; and ornamental lamp standards.

The Briton Ferry Coal and Pottery Company (Stand 252) send from South Wales some very good stoneware pottery for sanitary purposes.

Messrs. Doulton & Co. (Stand 253) have a good display of sanitary appliances, including their patent "Vacuum" water-waste preventer, "Lambeth Flush-out," "Lambeth Valve," "Lambeth Trapless," and other closets, and bath and water fittings. They have also a good show of their now celebrated Doulton ware, both in its more purely ornamental forms, and as applied to lavatories and other sanitary fittings, and a quantity of architectural terra-cotta and Lambeth faïence. Everything on this Stand will bear examination, and sustain the reputation of the firm.

Messrs. Beard, Dent, & Hellyer (Stand 254) exhibit their "Vortex" and "Artisan" closets, Hellyer's intercepter trap, water-waste preventers, housemaids' sinks, valve-closets, water fittings, and good specimens of plumbing work.

Hard-burnt architectural terra-cotta work of good colour, sharpness of line, and excellence of texture; also specimens of the "Lambeth majolica," are shown in variety by Messrs. James Stiff & Sons (Stand 255). This firm are also exhibitors of a large assortment of sanitary pottery, including Soper's "Hospital drain-disinfecter," as used at Stockwell Small-pox and Fever Hospitals, and elsewhere; Weaver's "Ventilating sewer-air trap;" Stiff's "Inter-

cepter" sewer trap; and the "Weatherly disconnecter waste-water trap"; together with a double form of the latter, just devised, and called the "Weatherly disconnecting and ventilating drain-trap," which they claim to be the "latest and best" sewer-trap. In it the requirement of disconnection is met by means of two entirely separate water seals at different levels. It should be looked at by visitors.

Messrs. J. Tylor & Sons (Stand 256) make a display well worthy of their reputation. Among their exhibits we may particularly specify their slop or housemaid's sink, with flushing-rim, as used at St. Bartholomew's Hospital; their lavatory-basin, with back outlet and flushing-rim inlet; their patent "Waste not" valve, as fixed for the Corporation of London in several of the courts and alleys of the City, and which only supplies one pailful of water at each movement of the valve; and their automatic district water-meter.

Stand 257 is tenanted by that pioneer of inventors and manufacturers of modern sanitary appliances, Mr. George Jennings, who, it need hardly be said, shows many good things. Besides closets of various kinds, he exhibits in action his patent automatic flushing apparatus for urinals and other purposes; also his patent ball-trap and bath supply and waste. A notable exhibit at this Stand consists of a number of the Du Bois drawn-lead traps, in various forms. These are American products, and well merit the attention of English architects and plumbers.

At Stand 258, Messrs. Robert Boyle & Son make a good display of their well-known and long-tried "air-pump" ventilators. Among many buildings in which their system of ventilation has been successfully applied is the London Custom-House, and some experiments to test the power of the ventilators applied there were not long ago recorded in our columns.

Messrs. Edward Brooke & Sons (Stand 259) exhibit their patent ribbed drain-pipes, which have ribs flush with the outside face of the socket, running longitudinally the whole length of each pipe. The object is to secure strength, to prevent breakage of the socket, and to facilitate laying. The same firm are also exhibitors of a variety of sanitary pottery, including Kirk's "Combined Double-ventilating Sewer-trap and Slop-dish," the invention, we believe, of an architect.

Mr. W. P. Buchan (Stand 261) shows his improved patent drain-pipes, each pipe being made with a small attached block or seat moulded with and forming part of the faucet or socket end. This block is flat at its base. The use of it is that it raises the pipe sufficiently to allow the hand or tool to pass easily beneath the pipe, so as to facilitate the making of a proper joint. Mr. Buchan also shows his ventilating drain-trap, and his "induced current ventilating cowl" for soil-pipes, &c.

At Stand 262 is shown the "Shrewsbury" closet, the invention of Mr. William White, F.S.A., architect. It is provided with special and novel means for securing efficiency of flush, and has previously been described by us.

At Stand 263 Mr. Edward Warner shows a good syphon disinfector for water-closets. The syphon-pipe leading from the reservoir containing the disinfecting agent has one end connected with the pipe that supplies the closet with water, and the passage of the water through the supply pipe causes a vacuum in the syphon, and leads to the discharge of a measured quantity of disinfectant.

The Banner system of sanitation is fully illustrated, both by drawings, models, and the actual appliances used, at Stand 264. Mr. Banner also shows a working model of his proposal for ventilating the Underground Railway. How greatly the ventilation of that line is needed will be known to those who are obliged to travel by it, especially during the present hot weather. Mr. Banner proposes to divide the up and down lines by enclosing them in tubes or cases of sheet metal, and to affix to the engine in front of the driver's footplate, but in the rear of the chimney, a disc or screen nearly the full size of the space enclosed for the line, the idea being that the screen will drive before it all or nearly all of the suffocating fumes given off by the locomotive.

Messrs. W. Ingham & Sons (Stand 266) exhibit a chimney-piece constructed of glazed terra-cotta bricks of ornamental design. This method of construction ensures cleanliness and cheerfulness of appearance, and can be readily adapted to any width of opening. Brown's patent "Accessible" syphon-trap, shown by the same firm, has also a movable lid or cover over the upper part of the trap, giving ready access not only to the trap on the outlet side, but to the drain into which it discharges. McLandsborough's double-trapped ventilating gulley for house and surface drainage is made and exhibited by the same firm. Both these traps are made of salt-glazed stoneware. Another specialty shown by this firm is Adams's "Automatic Trough Flushing Closet," which is made of glazed fireclay, and the contents of which are discharged by automatic syphon action. Some very good terra-cotta chimney terminals are shown at this stand.

Mr. D. T. Bostel (Stand 268), besides exhibiting his improved "Brighton Excelsior" water-closet, shows a new thing in the shape of Holt's patent pneumatic flushing cistern and water-waste preventer. It contains no valve, but is discharged by means of bellows which are compressed by the pulling down of a chain or lever and exhaust the air in a syphon, thus creating a vacuum and allowing the water in the cistern to be discharged.

Messrs. Thomas Smith & Co. (Stand 269) exhibit Herbert Jones's patent drain-pipes and junction caps, and a variety of other sanitary stoneware, including Palmer's gulley and disconnecting trap, in which provision is made to utilise the rain-water falling on the roof of a house as an additional means of flushing the trap, the down-pipe being carried into the drain on the inlet side of the trap. Messrs. Smith are also exhibitors of pottery for chemical purposes, and of terra-cotta chimney terminals.

Messrs. Joseph Cliff & Sons (Stand 270) are exhibitors of some specialties in sanitary pottery, including terra-cotta sinks and baths enamelled inside, and mangers and troughs for cattle, sheep, and pigs. Whether intended to be used by man or beast, nothing can be more cleanly than these articles. This firm also exhibit in great variety architectural terra-cotta, majolica, and faïence; and damp-proof courses and similar necessary adjuncts of a healthy habitation.

The Birmingham Sanitary Association (Stand 271) exhibit Potts's "Edinburgh" air-chambered sewer-trap, which has many good points. It has, we believe, been adopted for use by the Birkenhead and Bolton Corporations, and by many local boards, for use in their public buildings.

Mr. J. E. Ellison (Stand 278) exhibits his conical-perforated bricks and air-grates for ventilation, several times previously noticed by us as a good means of admitting air to rooms without draught. A modification of the same appliance is shown in Mr. Ellison's patent air-diffuser, which admits the air into a room through a grating in the outer face of the wall. Sliding in and out of the opening made in the wall to receive the grating, there is a wooden trunk or box, open at the back, opposite the grating, and admitting fresh air into a series of wedge-like chambers formed between two circular plates of wood or other material by radial divisions. The front of this apparatus, facing the interior of the room, may be made to assume the form of a mirror or decorative medallion.

Messrs. Wilcock & Co., of Burmantofts, Leeds, exhibit (Stand 279) their "Sanitary Trough-closet" (Holroyd's patent), admirably suited for situations where anything less simple would get out of order by reason of rough usage. It need hardly be said, however, with regard to trough-closets, that the caretaker who has charge of the keys of the valve-chest should be a person who can be relied upon to flush out the troughs at stated intervals. The same firm are exhibitors of a variety of sanitary pottery, including a stoneware street-gulley, as used by the Leeds Corporation. They have also a good show of majolica and faïence adapted for architectural work.

The Thames Bank Iron Company (Stand 280) exhibit their improved base-burner gill-stove and other stoves for warming by hot air; also saddle-boilers, coils, &c., for warming by hot water. Their laundry roof, with gear for ventilating, is simple and handy in contrivance. Such articles as sluice-valves, manhole-doors and frames for sewers, gulley grates, &c., are exhibited at this stand in profusion.

Messrs. Shanks & Co., of Glasgow (Stand 281), exhibit baths and bath-fittings, including a very convenient sitz-bath of, we believe, American device. This firm's specialties seem to be valve and other water-closets, housemaid's sinks, lavatory basins, &c., in earthenware, encased on the exterior with iron to diminish liability of breakage.

Messrs. Maguire & Son, of Dublin (Stand 282), exhibit their patent "safety-joint" drain. The drain-pipes are of ordinary salt-glazed stoneware, each alternate pipe having an inspection cap or cover, which enables the workman or the supervisor of the work to satisfy himself beyond doubt that no cement forced up into the pipes by the insertion of the spigot into the socket to make the joint is left inside the pipes to impede the flow of sewage. Security from danger to the joints externally is afforded by the stoneware "cradles" in which the lower halves of the socket-joints rest, the space in the "cradles" not occupied by the pipes being filled up with cement concrete, completely enveloping the lower halves of the joints, the upper halves being afterwards cemented over on the exterior. By these means a very strong and perfect joint is secured. The same firm's patent self-flushing tank is shown in action, and should be seen by visitors. Among other of their exhibits we have only space to mention their "improved safety disconnecting receiver" for bath-wastes, their portable and fixed disinfecting apparatus for hospitals and other institutions, their patent renewable water-filter, and specimens of "Anti-corrodo" (Barff's rustless) tubes and fittings.

The Shone Drainage, Sewerage, and Water-Supply Company (Stand 284), show their hydraulic and pneumatic sewage ejectors. They are the inventions of Mr. Isaac Shone, C.E., and have been applied at Wrexham. We understand that sewerage works upon this principle are in course of construction at Eastbourne and Winchester. The apparatus, which is shown in the Exhibition by working models, is also applicable to purposes of water-supply. A flushing-tank, the syphon of which is started by an automatic tipping basin (the invention, we believe, of Col. Jones, V.C.) is also shown in action.

Mr. J. Charlton Humphreys, besides exhibiting (Stand 285) specimens of corrugated galvanised iron as applied to the construction of temporary hospitals or other buildings, has been entrusted with the work of enclosing the northern portion of the western arcade for the use of the Medical department of the Exhibition.

The Sanitary Engineering and Ventilating Company (Stand 286) are exhibitors of the "Imperial" vertical tubes and other appliances for ventilation, and of their method of "house drainage on the air-flush system."

The Silicate Paint Company (Messrs. J. B. Orr & Co.) exhibit (Stand 287) their non-poisonous paints and colours, including "Charlton white," oils, pulp-colours for paper-stainers, silicate paints and enamels, and silicate distemper,—which possesses the sanitary merit of being washable. It can be executed in any design or colours.

Messrs. Frederick Walton & Co. (Stand 288) exhibit specimens of their "Linerusta-Walton," a decorative material for walls, &c., which has more than once previously been noticed by us with commendation. While capable of an infinite variety of treatment in design and colour, it has important sanitary merits.

The Sanitary Paint Company (Griffiths, Berdoe, & Co.), (Stand 289), are exhibitors of sanitary and enamel paints and petrifying liquids. Among their specialties may be mentioned silicate distemper (washable), Griffiths's vermilion, stated to be about half the price of ordinary vermilion, and not liable to fade in the sun; "Stegonite," a cheap paint in all colours for iron and metal work generally; and Griffiths's zinc white, a desirable substitute for white lead.

The Albissima Paint Company (Stand 300) show their "Sanitary Paints," made from zinc. It is claimed for them that they are absolutely non-poisonous; that their covering power is from 25 to 50 per cent. superior to the best white lead; that they are durable and unaffected by impure atmosphere; and that they are very easy of manipulation. This paint seems to be a good material.

Messrs. Candy & Co., of the Great Western Pottery Works (Stand 301) exhibit, among a quantity of sanitary salt-glazed stoneware, the "Registered" sewer-gas excluder, with double water seal. This is a very useful disconnecting trap. The "Chudleigh" soil-pipe trap and sewer ventilator, for fixing at the bottom of vertical soil-pipes; and the "Mason's Trap," a substitute for the old-fashioned brick and cement trap, with inspection hole and ventilating opening, are also among the exhibits of this firm, who also show damp-proof bricks of stoneware and terra-cotta, with vitrified and salt-glazed

surfaces. These combine great usefulness with comparative cheapness.

Messrs. John Finch & Co. (Stand 302) show their "Royal Porcelain" bath, made in one piece of fire-clay, with *bisque* glaze on the interior. For cleanliness nothing can surpass it. The same firm are also exhibitors of bath fittings, porcelain sinks, ventilating drain-traps and pipes, glazed bricks for sanitary and other purposes, and of a self-acting water-closet flushed by the movement of the seat

Messrs. John Bryden & Sons (Stand 303) exhibit a variety of useful inside and outside blinds, and some improved fittings for facilitating the opening and closing of the same. This firm are also exhibitors of wire hang and electric and pneumatic bells and indicators, apparatus for opening window-sashes, &c.

Mr. A. T. Angell exhibits at Stand 304 his patent air-tight cast-iron sewer flap.

Mr. Henry Seward, F.C.S. (Stand 305), shows full-sized models, and specification and drawings of his patent "Disinfecting Vaporiser" as applied to street-gullies, water-closets, &c. The apparatus consists of a vessel to hold a supply of carbolic acid or other volatile disinfectant, so protected as to prevent water passing into such vessel, but allowing the vapour of the disinfectant to freely and continually escape. As applied to a street gulley the vessel to contain the disinfectant takes the shape of a narrow trough surrounding the upper part of the gulley hole, and protected from the influx of water by being placed under the shelter of the framework of the grid. As applied to D or syphon-traps of water-closets, a similar gallery or trough is provided to contain the disinfectant just at the entrance of the closet pan or basin into the trap. As applied to a pan-closet it consists of a small box or chamber attached to the upper part of the interior of the container, a vertical pipe being led up through the top of the container to the level of the seat for the purpose of replenishing the box when needed.

Mr. Edward Howard (Stand 306) exhibits the improved "Duplex" lid and automatic flusher for water-closets, adaptable also to housemaids' sinks, lavatories, urinals, &c. The apparatus is the invention of Mr. H. Saxon Snell, architect. The lids or covers are so contrived that when shut down the water-closet pans, the sinks, or the lavatory-basins, as the case may be, are completely shut off from the house, and a flue is provided to convey away any effluvia which may arise from them. The action of shutting down the lid, in the case of a water-closet, empties and flushes the apparatus.

Mr. Frederick Dyer (Stand 307) exhibits his arrangement for preventing kitchen-boiler explosions. The chief feature of the system consists in the substitution of an upright cylinder, placed near the boiler (say in one of the recesses by the side of the kitchen chimney-breast) for the usual hot-water circulating apparatus. The boiler, which for greater economy of fuel and rapidity of heating is made with tubes running through it from the fireplace into the flue, is of course in connexion with the cylinder, and has an ordinary flow and return. From the top of the cylinder, and also from the boiler direct, the hot-water is caused to circulate throughout the house and back again to the boiler. Mr. Dyer also shows a tidal trap-valve for sewage outfalls. It consists of a solid india-rubber ball, suspended by a hinged lever somewhat in the manner of an ordinary plumber's ball-valve, and which, on the influx of the tide into the outlet, is made by the pressure of the water to impinge tightly against a gun-metal seating.

Mr. John Parker (Stand 313) shows his self-acting dry earth-closets in various forms. Either earth or ashes can be used with this apparatus, and provision is made for separating the liquid from the solid matters.

Mr. J. R. Pickard (Stand 315) is an exhibitor of a domestic fire-grate intended to consume its own smoke and to prevent down-draught, a concomitant advantage being, of course, economy in the consumption of fuel. The only outlet into the chimney is through a movable perforated fire-back, which may be of iron or fire-clay A damper is provided for regulating the draught to any required degree. The inventor claims that this arrangement is applicable to all existing furnaces, stoves, and ranges. It is, of course, intended to burn any kind of coal. The same exhibitor shows a model of his patent tubular atmospheric smoke-consumer as applied to boiler furnaces, and a model of his "Gormand" furnace for consuming by "cremation" town refuse of all kinds. An ash-closet and a carbonising oven are also shown by him.

Mr. Alfred Shaw (Stand 316) exhibits a "self-contained mechanical dry closet, requiring no water-flush." It is made entirely of metal and earthenware, and is very costly, and we are afraid that its costliness will not be compensated for by its efficiency.

Moule's Patent Earth-Closet Company exhibit at Stand 317 their earth-closets and commodes in a variety of forms and materials.

At the Journeymen Plumbers' Stalls (320, 321, 322), which were not complete at the time of our visit, and particulars of the contents of which are not contained in the first issue of the official catalogue, several working members of the plumbing craft have sent in specimens of what they have been able to do in competition for the prizes offered in connexion with Mr. Hellyer's lectures under the auspices of the National Health Society. The specimens of work vary somewhat in execution, but many of them are very good. Mr. S. Fairchild, a journeyman plumber, exhibits a design for a system of sanitary plumbing applicable to a town mansion. He would place all the water-closets and other offices in a separate wing or tower, separated from the main building by double doors forming a lobby, giving cross-ventilation to this lobby by means of windows on each side of it. All soil and waste-pipes are shown trapped, ventilated, and disconnected from direct connexion with the drain.

Mr. James Woodward, of Swadlincote (Stand 323), shows his patent wash-out closet, which is simple and effective. He also exhibits a very useful "wash-up" sink, consisting of a basin with a corrugated surface or slab, on which to place cups and other vessels to drain after being washed.

The Antiseptic Apparatus Manufacturing Company exhibit in action at Stand 324 their simple appliance (of which we have spoken favourably on previous occasions) for preventing foul smells from water-closets. It can be easily fixed to any kind of water-closet.

Stand 325 is occupied by Messrs. Smith & Barnes, who exhibit a system of joint-making in plumbers' work without the use of metal pot and irons.

Mr. F. G. Underhay (Stand 326) exhibits valve and other closets and water fittings in great variety, and of a quality fully sustaining the repute of the exhibitor.

Messrs. C. H. Sharp & Co. (Stand 327) show a combination water-closet, slop-sink, and urinal, and, among other things, their "Crown Ejector" ventilator.

At Stand 328 Messrs. Ihlee & Horne have a dark room in which they show the luminosity of Balmain's patent luminous paint, as applied to, among other purposes, hospital ward ceilings.

Messrs. Hayward Tyler & Co. (Stand 329) show among their specialties a new form of closet, named by them the "Full-Flush Valveless Closet," which is virtually a greatly-improved form of hopper-closet, with very superior means of flushing. The basin closely resembles in shape that of a valve-closet. This closet can be fitted in the space occupied by any pan-closet. The same firm exhibit several other things worth attention.

Mr. Henry Owen (Stand 330) shows his new patent trapped urinal, slop-sink, and lavatory combined. When not in use the urinal is concealed. The lavatory-basin is made to tip-up and discharge through a spout at the back into the urinal. The same exhibitor has on view his double-trapped and single-trapped water-closets, and his gully and fat-trap combined.

Messrs. John Warner & Sons (Stand 333) exhibit water-closets in great variety. A portable water-closet or commode shown by them has many good points to recommend its use in the sick-room. This firm also show a public water-closet, and self-acting water-waste preventer; a pan-closet with an earthenware container; and bath and water fittings of excellent construction. Visitors not yet acquainted with it should inspect a very valuable appliance made by this firm, viz., Randall's patent boiler safety-valve and tap, the general adoption of which would, we believe, prevent many a disaster.

Messrs. Bowes Scott & Read (Stand 340) show in action a self-acting flushing-tank or chamber, fitted with Mr. Rogers Field's patent annular syphon. It appears to thoroughly fulfil its purpose.

Messrs. Henry Sharp, Jones, & Co., of Poole, Dorset (Stand 341) are exhibitors of their well-known "Rock Concrete" tubes for sewerage purposes. They also show glazed stoneware pipes (fitted with Stanford's patent joint), and other sanitary goods, such as traps, gullies, &c.

At Stand 342, Purnell's syphon water-waste preventer is exhibited in action.

Messrs. Steel & Garland (Stand 346) have a good display of slow combustion and other grates, notable among them being the "Wharncliffe" patent warming and ventilating grate, which has lately been improved so as more readily to permit of the cleaning of the flue when anthracite coal or other smokeless fuel is not burnt in the grate. This firm are also exhibitors of fenders and fire-irons, tile-hearths, and mantelpieces in oak and marble.

Messrs. H. Braithwaite & Co. (Stand 347) show their patent syphon for water-closet and urinal cisterns, Claughton's patent stench-traps, and a "wash-out" closet.

We shall next week speak of the sanitary appliances and materials exhibited in the Eastern Quadrant.

HOSPITAL AND OTHER PLANS AT THE SANITARY EXHIBITION.

WE naturally turn, in the first instance, in making some notes at the International Sanitary Exhibition, to the department in which plans of buildings arranged with a view to sanitary conditions are exhibited. These are to be found in the upper floor of the Western Gallery, around the room in the centre portion of which are exhibited various classes of surgical instruments. There is, therefore, in this department something like an attempt at classification, though this does not extend to the catalogue even here, as the titles and descriptions (where there are any) of the plans are interspersed with various other matters which are in quite a different part of the exhibition. It is a great pity that more systematic effort at arrangement was not made. It is difficult to know where to find anything in the catalogue when it is seen in the room, and impossible to guess from the catalogue where to look for any object that is mentioned and that we may wish to see. Fortunately, a large proportion of the objects exhibited are accompanied by written or printed descriptions, and in many cases there is a custodian who is ready, in some cases we might say eager, to supply information, and thus it is possible by little and little to extract some of the instruction or illustration which the Exhibition is intended to convey.

The department of plans, however, is worst off and least useful of all in this respect. Architects naturally do not attend to explain their own plans, but there should have been more effort to render the plans self-explanatory. We have a good many plans of hospitals, for instance, many of which present very similar characteristics in general arrangement. Their superiority or inferiority respectively would depend very much on details of construction, ventilation, material, &c., which in many cases are not shown at all. A good many of the plans of buildings erected by Mr. Saxon Snell, for instance, and which we noticed recently in reviewing his book on "Charitable and Parochial Institutions," are hung on the walls; but without some of the detailed descriptions of the means employed to secure ventilation, which we had previously learned from the book, one might have condemned some of the plans as showing a strange indifference to the understood sanitary requirements in the plan of such buildings. A copy of the book; which might have given those who were interested in the plans (such as that of the Holborn Infirmary some further information about the systems adopted, we did notice on a table in another room, far away from the plans which the book illustrates, and among other objects having no connexion with it; and this seems rather typical of the general arrangement of the Exhibition.

We call attention to this point in the Exhibition, because if ever or whenever this kind of exhibition is attempted again, there ought to be a systematic endeavour to illustrate sanitary planning in a proper manner. It is not enough, indeed, it is of very little use, that architects should send general plans to be hung on a wall and looked at. It should be a rule, in inviting contributions to such an exhibition, that architects' plans should not be admissible unless accompanied by detail drawings showing in full the various ventilating schemes, heating apparatus, &c., and giving an intelligible description of the principle and method adopted. Without

such details and descriptions the hanging of the plans is of very little use. They are provided in some cases, but in many they are not, and some of the plans which might be among those of the most importance are so unpractical in their style and manner of delineation that they are nearly worthless for the purposes of the Exhibition, or for enabling the judges to come to any conclusion on their merits. There are plans by M. Tollet, for example, for a hospital at Montpellier, which, however, are not catalogued under his name, but under that of Dr. Mouat. After what has been claimed recently on behalf of M. Tollet's system of hospital planning, some special interest should attach to any illustration of it. But what we find in the Exhibition is only some very minute general plans, so small and so imperfectly drawn that it is difficult even to make out the intention in some parts of them, and quite impossible to understand anything of the detailed arrangements. As far as it is intelligible, it does not appear that the principal blocks are any more isolated or cut off from each other than in many other hospitals on the pavilion system,—indeed, not so well as in some of them in this country, for there appears to be a gallery running past the ends of the blocks, and opening directly on them all in succession. Certain departments for specially infectious diseases are treated as separate small houses, without any communication at all between them; this is the only specialty which we can make out from the plans. But such plans are simply useless for an exhibition of this kind.

The various plans by Mr. Snell, which come first in order on the walls, we have recently commented on sufficiently in referring to his published illustrations of them. The next specimen we come to is No. 57, plans by the Freehold Cottage Dwellings' Company, of workmen's cottage dwellings to be built in brick or in Haughton's patent concrete; six different classes of houses, costing in brick from 150*l.* to 285*l.*, and in concrete from 135*l.* to 255*l.* The plans are not very good; there is space lost in passages, and the water-closets are in too close and confined corners to afford a ready circulation and change of air, and in some of the plans they open from the scullories, which we quite disapprove of. Another set of artisans dwellings of much superior merit to these, is that numbered 60, by Mr. Rowland Plumbe, for the Artisans, Labourers, and General Dwellings' Company. These are well and economically planned houses, though the architect seems to have had difficulty with his larder; in one set of plans it is deficient in through ventilation, in another set it is specially contrived so as to secure through ventilation, but it is placed in too close contiguity to the water-closet to look quite safe. The exterior of the houses looks well, but evidently owes something in its effect to the prettily-executed perspective drawings; the houses have, however, the appearance of solid and substantial building. Under No. 61 are some plans for three-roomed dwellings for artisans by Mr. Mark H. Judge, providing two separate and distinct dwellings one over the other, each with separate street entrance, scullery, yard, and offices. These we published some time ago. The houses are as ugly as anything could be, but are satisfactorily planned in the main; it must be observed, however, that the water-closet accommodation is on the ground floor for both of them, and that the route to it from the upper house is somewhat roundabout. They might easily have been contrived to have the water-closet in similar position on each floor, which would have been very much better.

Some good suggestions in the way of dwellings for the poor are embodied in the plans by Mr. Lawrence Booth for Manchester and Salford Working-men's Dwellings Company. Mr. Booth adopts small blocks of six houses each, arranged in three stories, the central staircase, which is unroofed, dividing the block in two halves. He recommends small block systems, as they can be adapted to any size of site, by placing a greater or less number together. Each tenement contains living-room and bedroom, with separate water-closet with external entrance; the living-room fireplace is well contrived as an angle fireplace to take up very little room, and to send warmed air into the bedroom, which also has an exhaust-flue at the further corner. The houses are meant for a very cheap class of tenement, at about 2s. 6d. a week, and they are too small and too close at back, but they may be regarded as successful to a certain extent.

Among the hospital plans, we have one of some importance, for which Dr. G. V. Poore and Mr. Waterhouse appear to be jointly responsible (59), for reconstruction of the University College Hospital on its present site. The plan is stated to have been determined in its character in some degree by the nature of the present site, which in some respects left no choice in regard to arrangement. In the report appended, the authors refer to the opinion that hospital wards should be in one-story buildings, and observe that "this rule might be followed if cost were no object, *and if there were no high buildings in the immediate neighbourhood*," the latter sentence being italicised in the report. We fully agree as to the very great difference in the conditions when there are high buildings already existing contiguous to the site. The advantages of one-story building must be very much neutralised in such a case, but the question then arises why should a hospital be built under such conditions? The principle of the scheme is, we may say, almost as a matter of course, the pavilion system, the building resembling the letter E, the three pavilions pointing towards the open space in front of University College, so that "every part of the building is thus made accessible to what pure air there may be on this space," and the building is so arranged that it should be impossible to pass from one pavilion to another, from one ward to another, or from one story to another, without going into an open corridor. "It might be objected that great inconvenience would thus be caused to those who have to visit the wards; but a doctor visiting the wards of a hospital should regard himself rather as walking from house to house than from room to room, and should be clothed accordingly." The scheme appears to be well carried out in the plans. The only point we are disposed to question is the planning of the lavatory blocks at the ends of the wards, in which the w.c. can only be reached through the bath-room, and is not very well ventilated in its approaches. It is surprising, we may observe, how seldom this portion of hospital adjuncts is really well planned, even in cases when every attention is supposed to have been given to securing the best possible arrangement. Another point in the scheme seems to us doubtful,—the omission of any nurses' rooms in connexion with the wards. The reason given is that when the nurse is on duty her proper place is in the ward, and when not on duty she is better out of the hospital. It seems to us hard on the nurse that, in the course of long hours of duty, she should not have a small space for herself, apart from the general ward, on occasions when she is not at the moment engaged in any ministrations, and the room may surely also be very useful for the orderly bestowal and arrangement of things wanted for use in her work.

Mr. Ernest Turner's plan for the small Fever Hospital at Newton-road, Devon (64), is a thoroughly practical one. There are open corridors with wards at opposite ends, the administration portion of the building opening out of the centre part of the corridor; the wards have a nurses' room and a bath-room, with a bath on wheels, in the centre of each ward block, dividing them practically into two smaller wards. The small blocks containing water-closet and sink are put at the angles of the wards, not obliquely, but so that the corners of the blocks are just sufficiently in contact to give room for passage through, and they are very well planned and isolated.

The plans for the North Staffordshire Hospital, by Mr. H. C. Robins, are not only good in a sanitary point of view, but form also a pretty and effective building in an unpretending style. The windows are formed in bays, V-shaped on plan, with the object of enabling patients in bed to see out of window to some extent; a good idea. The same architect exhibits two or three other plans of buildings of the same class.

The plans for the Salford Union Hospital, by Mr. Lawrence Booth, are evidently suggested by the general disposition of St. Thomas's Hospital, which the architectural treatment to some extent imitates. The plan would have been more satisfactory, in fact, if it had more closely imitated the Lambeth building in having the ground-floor corridors of communication open; in this instance they are closed. The water-closet blocks are at the angles of the wards, placed obliquely. The oblique position has been, however, condemned by sanitarians, as it affords more facility for the communication of fouled air from the window of the water-closet to the ward windows than when the two are in the same parallel line. The ventilation scheme is not very clearly indicated; there are fall-back upper sashes to the windows, there appear also to be inlets at the ground-floor, and there is an extract in the roof from the upper-story ward, but what is the extract from the lower wards is not so manifest.

The plans of the West Herts Infirmary, and the South Devon and East Cornwall Hospital, by Messrs. Coe & Robinson, do not present any special points for comment; they seem fairly good. Mr. Chisholm's plan of the Lying-in Hospital at Madras is a very effectively got up plan, with lots of shading and tinting, but unfortunately attractions of that kind do not help one much in determining the sanitary qualities of a plan. We can see that the whole is largely built of wood and enclosed in verandahs, the first point probably unavoidable, the second in every way desirable; and we can see that the hospital is divided into small wards of four beds each, and we learn from the catalogue that the rooms adjoining each such ward are a nursery and scullery, and that the central block contains the labour wards, and is connected with the other four pavilions by covered ways. There are some indications of a means of screening the patient actually under "the pain and peril of childbirth" from the other occupiers of the same ward; at least, we took certain marks in the plan to be indications of a screen, but may be mistaken. From the small block plan appended, it appears that the latrines are in a separate detached block entirely away from the main building; in hot climates this would, no doubt, be the best arrangement for dwellings for people in health, but it is difficult to understand how this can work for invalids. No details of these or of any other practical matters are given.

The National Hospital for the Deformed, proposed to be erected in Great Portland-street (73), is shown in a very complete set of plans; no architect's name in the catalogue. As a hospital plan in the ordinary sense, it would be deficient in isolation of the various parts, but possibly it is considered that a hospital for the treatment of mechanical ailments only may be regarded in the same light as a dwelling for healthy people. As such cases involve surgical treatment, however, this argument would not hold.

Dr. A. Tripier, a French sanitarian, exhibits one or two sections showing plans for the ventilation of theatres and hospitals. The sections show little or no detail, but are accompanied by brief descriptions. The hospital ventilation is operated by a large central duct or ventilating flue going up through the centre of the floors, with openings into each room. This is the inlet, and is intended to be a descending shaft in summer, with the influx accelerated if necessary by mechanical means (not described), and an ascending shaft in winter, sending artificially warmed air up from below; the extract in both cases is the same, through the outer walls near the floor. To make this act, the mechanical propulsion in summer would be always necessary, we should surmise, otherwise there seems no particular reason why the outlets should not become the inlets, and *vice versâ*. With this reservation, there is a simplicity and an equality of air-service for each floor which seems to recommend it. The sketch by the same exhibitor for the ventilation of a theatre, adopts the principle of influx from the stage, and from over the proscenium, to the centre and circumference of the house; and extract around the circumference by ducts leading to a central extract in the roof over the auditorium. The principle is right as to its general form. There is nothing to show whether propulsion is to be adopted, or merely natural influx; the former would probably give the most successful results, but is costly. There is another theatre scheme hanging at a little distance from this,—that of the Théâtre de la Monnaie, at Brussels,—which is stated to have given great satisfaction to its audiences, in the way of ventilation, for some years; but, unfortunately, the plans explain nothing, in spite of the number of arrows with which they are covered.

Among the remaining exhibits in this department is Captain Galton's large plan of the Herbert Hospital at Woolwich. No details are given. As a plan it is hardly up to the mark in the planning of the latrine lobbies, which are deficient in through ventilation. There is a plan (81) for carrying out Professor Marshall's circular ward system, by Mr. Francis E. Jones, which seems to us superior to Mr. Snell's plan. It places the circular wards at the four angles of a parallelogram, the administrative buildings taking the form of a cross in the centre space, with connecting corridors to the circular wards.

A perspective view of the building is given, which is not ineffective, but wanting in homogeneous character. There are drawings of the Camden Turkish Baths, and of a proposed hydropathic establishment at Bournemouth, by Mr. H. H. Bridgman, which are worth attention, and some views of the interior of the "Roman Bath" at Vienna, which serve to suggest what delightful internal architectural effect swimming-baths are capable of when economy is not a rigidly-enacted condition. Mr. H. G. Brace exhibits (66) section and details of a house, showing a system of ventilation which is at least intended to be very complete, but seems to err on the side of complication in the number of its inlets, and the extraction into the smoke flues is not to be recommended. We will illustrate, and our readers may judge for themselves. An admirable and most practical bit of sanitary illustration is Mr. Turner's small plan (64) of drainage system as applied to an ordinary house, with the manholes of interception shown, and the drains carefully distinguished under various classes by colouring. It is a pity there are not more detail drawings of this sort got up with the same care and finish. A curiosity of the Exhibition consists in the number of sheets of pen sketches contributed by Dr. Bastien, and said to be drawings of apparatus for the Ambulances Parisiennes. A good many of the sketches, however, look like jokes, and scarcely any of them are comprehensible in the absence of any description.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

THE conditions of the preliminary competition, drawn up, we believe, by Mr. Charles Barry and the Glasgow City Architect, have been published. We have already stated the terms decided on,—a preliminary competition of sketch designs, open to all, and a final competition between not fewer than six and not more than ten selected for the purpose. To each of the selected competitors 150*l.* will be paid towards his expenses. The architect placed first in the order of merit by the architectural assessor or assessors to be appointed for that purpose, is to be employed to execute the new building as architect unless some insuperable obstacle shall arise; in which case the author of the design second in order of merit shall be employed, and so on. The sketch designs are to be sent in by November 30th. Full particulars will be found in our advertising columns. If we have an unknown genius among us, he may now show himself.

PROSPECTIVE LARGE EXPENDITURE BY THE METROPOLITAN BOARD OF WORKS.

THE money bill of the Metropolitan Board of Works, which has just been introduced to Parliament, shows an unusually heavy prospective expenditure. Amongst the sums applied for under the Bill is 9,000*l.* as the cost of the sphinxes about to be placed on each side of Cleopatra's Needle. For the purposes of main drainage and sewerage, 100,000*l.* is asked for. For the re-building of Battersea and Putney Bridges, under the Bridges Act of last session, 760,000*l.* is required; also 34,200*l.* in respect of the new Hackney Commons; whilst 100,000*l.* is asked for in the Bill for "minor improvements" and contributions to local improvements. For parks, commons, and open spaces, 15,000*l.* is wanted; and 30,000*l.* for works in connexion with the Fire Brigade. The large sum of 1,500,000*l.* is also asked for to be expended in street improvements; whilst 300,000*l.* is required in connexion with artisans' dwellings. In addition to these borrowing powers, the Bill asks for powers to advance loans to vestries and district boards to the extent of 200,000*l.*; to boards of guardians 150,000*l.*; to the managers of the metropolitan asylums 50,000*l.*; to the London School Board 600,000*l.*; and to other public bodies 100,000*l.* The actual amount of the Board's borrowing powers provided by the Bill is 4,536,334*l.*

Windsor Castle.—The roof of the Guard-house, containing about 5,000 ft. of some kind of asphalte, is being stripped, and in its place the quality supplied by Claridge's Company will be laid.

TECHNICAL EDUCATION: THE NEW INSTITUTE.

ON Monday afternoon last, with a considerable amount of ceremonial, befitting to so important an occasion, H.R.H. the Prince of Wales, President of H.M. Commissioners for the Exhibition of 1851, fixed a granite shaft of the Central Institution of the City and Guilds of London Institute for the Advancement of Technical Education, the site of which, upon the estate of H.M. Commissioners for 1851, has been granted by the Commissioners to the City Guilds at a nominal rent. Originally the site had been fixed upon that side of the estate which is farthest away from the museums and libraries belonging to the Science and Art Department. Fortunately this obvious error has been corrected, and the students of the new institution will find the South Kensington collections and libraries almost contiguous for reference.

A numerous company, representative of the state, the civic, the scientific and artistic forces engaged in promoting national education, was gathered together to do honour to the occasion. The chief burden of the proceedings was borne by H.R.H. the Prince of Wales and the Lord Chancellor, who is Chairman of the Council of the City and Guilds of London Institute. The two speeches, made by H.R.H. the Prince of Wales and by the Lord Chancellor were, from some points of view, by far the more important of the incidents of the occasion.

Lord Selborne spoke of "the objects of the Institute as being the improvement of the industrial and commercial pursuits of this country, by affording facilities to apprentices, foremen, managers of works, and manufacturers, to become practically acquainted with the principles of science and art in their application to industrial operations." This extended description is reduced in his lordship's next sentence to "a system of education for artisans, intimately associated with the purposes for which some of the guilds were originally founded." In mentioning the earlier labours of the guilds in promoting "technical education," the Lord Chancellor called the object of their labours, "technical science and art," "technical instruction," and "technical education." Some of the instructional work done by the guilds was described by Lord Selborne specifically; such as the application of chemical science to manufactures, and the application of electrical science to the transmission and conservation of energy. At the new Institute, the Lord Chancellor said, it was intended to provide means for imparting to persons engaged in professional or commercial pursuits "a knowledge of some branch of mechanics, physics, or chemistry," which "in its practical application will be found not only serviceable, but almost indispensable," to their pursuits. "Here," he continued, "it is expected that artisans who have shown merit, and have won distinction at the branch or provincial colleges, will complete the training which may qualify them to act as managers and superintendents of works. . . . . Here it is anticipated will be trained that body of technical teachers of whom there is in England at the present moment so great a need, who will carry with them from this College into the manufacturing centres, to be there imparted to other students, a knowledge of the theory and practice of the various crafts and industries. . . . . The aim of this institution will be to supplement the teaching of the excellent schools [of science and art] situate in the neighbourhood, by giving instruction in the practical application of science and art to the trades and industries of the country, and by cultivating and endeavouring to stimulate inventive genius."

To this address his Royal Highness the Prince of Wales replied, and in the course of his speech made the following remarks which bear upon the meaning of "technical education":—"Hitherto English teaching has chiefly relied on training the intellectual faculties, so as to adapt men to apply their intelligence in any occupation of life to which they may be called. . . . . Both in Europe and America technical colleges for teaching, not the practice, but the principle, of science and art involved in particular industries, had been organised in all the leading centres of industry. England is now thoroughly aware of the necessity for supplementing her educational institutions by colleges of a like nature. Most of our great manufacturing towns have either started or have already erected their colleges of science and art. In only a few instances, however, have they become developed into schools for systematic technical instruction."

There can be no disrespect in candidly avowing that it is not an easy matter for any one to obtain a distinct idea of the exact drift of either of these speeches. Both, of their kind, are authoritative, and must have some effect in moulding a public opinion as to the meaning of technical education. A leading theme of the Lord Chancellor's remarks is that a "technical" or "special" course of instruction for artisans and managers of works is required. In an opposite direction, H.R.H. the Prince of Wales is reported to have said that "English teaching has chiefly relied upon training the intellectual faculties," implying thereby apparently that handicraft had been neglected in favour of overburdening Englishmen with intellectual training. Surely as a matter of historic fact, not to say experimental truth, the force of which has raised our manufactures so high in the estimation of the world, the point in which English workmen excel has been soundness and completeness of workmanship. To enable this quality of workmanship effectually to compete with the less solid, but nevertheless at present more remunerative, workmanship of other countries, is no doubt the aim of the so-called "technical educationalist." This aim, in so far as English workmanship or handicraft is concerned, resolves itself very much into one of economy of labour. British handicraft has, it appears, enjoyed its prestige chiefly on account of its extravagance of completeness. Its goodness was wastefully good. These facts modern science has brought to light. Modern science is responsible, therefore, for remedying the defects. But no confusion should exist by which it may be sought to make modern science identifiable with City guilds, or *vice versâ*. The guilds have not kept that watch which would qualify them to receive the accolade for their scientific and educational proficiency. Indeed, they have hardly defined the object of their quest. A principal gist of technical education certainly seems to be to infuse into our workmen a leaven of economy in their expenditure of labour and their employment of material. The very demon of shoddiness, which Carlisle execrated, has perhaps his good economical points; and it is the discovery and dissemination of a knowledge of these good points which English handicraft probably requires. With some such simple idea before them, the managers of the City Guilds Institute may hope to serve the cause of English handicraft. For the present, let them rather shut their eyes to the somewhat Quixotic pretence of being able to train handicraftsmen, and, in a sort of carrying-coals-to-Newcastle manner, of supplying the manufacturing centres with *teachers* (?) of "crafts and industries," as mentioned by Lord Selborne. A course of action for the City guilds who wish to cast off the odium of a longish series of extravagant banquets, and to return to an intelligent interest in their various trades, is traced in a perfectly straight direction by the finger-post, "economy in labour and material." This means providing handicraftsmen with thorough instruction in certain fundamental scientific principles which experience has shown can affect the processes of their labour and the materials of their use.

With no desire to unduly disparage what the City guilds have already done, we can safely affirm that the chemical lectures and laboratory practice at Cowper-street Schools, the metallurgical lectures at King's College, the art instruction at Lambeth, are not distinguishably different from chemical lectures, laboratory practice, metallurgical lectures, and art instruction given under the auspices of the Government Department of Science and Art. As to the technological examinations, through some unfortunate little fit of jealousy, the City guilds made an initial mistake when they undertook to take them over from the Society of Arts, by altering their plan, which had been carefully devised by the highest scientific authorities. It is certainly to be hoped that the City Guilds Institute may, as Lord Selborne said, supplement the teaching given in the Training Schools for Science and Art under the Science and Art Department. But how or when this may be expected, when at the onset the City guilds have had the temerity to reject the highest scientific advice, it is hard to say. Nevertheless, time works wonders, and between last Monday's ceremony and the opening of the South Kensington laboratories, lecture-hall, theatres, and classrooms the "Divinity that shapes our ends,

rough-hew them as we will," may have led the managers of the Institute to see the technical wisdom of taking the advice which experience can offer them; as well as the non-technical and extravagant futility of contentedly believing that the blind can lead the blind.

WINCKELMANN.

WINCKELMANN'S is a name which, for more than a century, has borne with it the respect of the world,—a respect paid to it quite as much, we suspect, on reputation, as on familiarity with his books. Since the publication of the great German's works, the researches of later students have gone far to render somewhat antiquated his views. We know that with all the enthusiasm and earnestness he possessed,—so necessary a quality in studies of this nature,—the funds of information at his disposition were limited; we know how many elements in the development of the history in which he was so interested were unknown to him; we know that writers who have succeeded him are now set aside by reason of the advance that the science of archæology has made within this century,—since, in fact, he himself gave the first great impetus to the study. But still the reputation of Winckelmann stands foremost among the names of those who have searched antiquity for the lessons it may teach. We respect as we do in his great predecessor, the learned Benedictine Montfaucon, the enthusiasm that he showed in his pursuit, but we feel unconsciously that he belongs to a time gone by, that his views are those of another age; we have, in fact, accepted his reputation, we look upon him with the respect that is due to an ancestor.

In the present day, when art, artistic admiration, and art-criticism are made so much an affair of fashion, and even of *cliques*, or, to use a more English word, of "sets," every true art-lover must welcome any effort made in a direction which will tend to widen the somewhat narrow views which,—must it be owned?—we in this country seem destined to take of art. Never should we lose sight of our admiration and emulation of Classic art, the efforts of its masters, their results and teachings; no narrowness of view can possibly result from our study of their beauties, beauties which Winckelmann was, if not the first to appreciate,—the Renaissance artists had long before his days worshipped their Classic predecessors,—the first at least to explain, to reason upon, and endeavour to analyse. We who admire and strive to rival the art of later centuries admire but a dilution of those noble beauties so much more easy to emulate than the original to which in the midst of our ever-shifting fashions the allegiance of the cultivated has never swerved. Something more, therefore, than a mere conventional expression of gratitude is due to the student who again draws before the outer world the lesson of admiration for Classic art, the only true and never deviating standard of all art-teaching, of all art-criticism, of all art-education.

It is, we consider, a fact worthy of notice that the recent publication by a London firm of a translation of Winckelmann's famous "History of Greek Art" comes to us from America. America has been forcing itself rather pertinaciously on the attention of the Old World of late, though in ways generally unconnected, it must be admitted, with the arts. The entrance of our cousins in the field of archæology is noteworthy, for the publication of such a work as Winckelmann's "History of Ancient Art" enters almost solely into that province. The name of the translator, Mr. Lodge, it is true, has been connected with the English translation ever since 1849, when, if we mistake not, the first edition of the work was published by him at Boston, and at London a year later. But until Mr. Lodge undertook the task no English translation of Winckelmann's great work existed, a fact which, when we consider the reputation of the author at the commencement of this century, cannot be said to speak highly in favour of the interest of our public in archæological matters. In France, scarcely had the original edition of the work appeared (1764) than a French translation,—it is true not a very correct one,—was published, and in library catalogues mention will be found of no less than three separate French translations of the work which threw such a new light on the study of the artistic remains of antiquity.

The publication of the "History of Ancient Art" marks, as has been truly said, an epoch in the annals of human thought. A theory of the beauty of Greek art was for the first time satisfactorily laid down,—the development, zenith, and decline of this art for the first time shown in connexion with historical and literary data. With the elements at his disposition, scant as we know them to have been, Winckelmann's history, as a history, is to us now of small use; the whole realm of Greek art since those days has been subjected to a study supplied with data of which Winckelmann was totally ignorant. Phidias and the work of the great school of Ægina who preceded the sculptor of the Parthenaic marble was known but by name to the curator of Cardinal Albani's collection; his eyes had never rested on the glories which now repose in the British Museum; Ægina and its temple treasures still lay buried; the Phigalian marbles were to Winckelmann unknown, the Venus de Milo, the temple of Olympia, the vases that fill our museums, the strange sculptures of Selinonte, the temples of Asia Minor, and, within more recent years, that whole store of information respecting Assyria, Phœnicia, and Egypt, not to mention Cyprus, which we owe to English, German, and French archæological zeal.

Winckelmann and his conjectures have long been left behind, and many an antiquary who has succeeded him; but our debt of gratitude must never be forgotten to the earnest scholar who first analysed in their artistic bearings the monuments of ancient art, who founded the modern science of æsthetic study, so different in its essence to that sickly product of morbid conceit so justly satirised at present in artistic quarters.

Winckelmann's "History of Ancient Art" must not, therefore, be looked upon as a history; his great work may be said to consist rather of a theory of plastic beauty,—the beauty of nature such as the Greeks interpreted it. The task he had undertaken, in the midst of the frivolity of the last century, was one the difficulty of which we of the present generation can little understand. It is true he was assisted largely by the spirit of reaction that had set in; the decorative simplicity of classic life had been singularly revealed to the artistic world by the discovery first of Herculaneum and then of Pompeii. The age was an age of literary antiquaries and patrons; but their services had remained more strictly confined to the enumeration of the classic treasures then in existence. It remained to Winckelmann to see this world of beauty in a new light, to analyse and compare its developments, and, having lingered over its details, to reveal the theory of its charms in language inspired by the noble artistic sentiments of the master-critic, Plato, expressed with the warmth of an enthusiasm which was till his day unknown to the literature of antiquarianism. Winckelmann's views were at once accepted; and if at first in the author's native country he was not immediately successful, he lived to see all opposition overcome. In German literary and artistic annals no name stands higher than that of the industrious struggling schoolmaster who rose to the proud position he occupied at the moment of his tragic death.

The life of Winckelmann has been on many occasions told and re-told. No life is more truly illustrative of the success that ever waits the efforts of well-directed labour. Nothing more clearly proves the heartfelt devotion of the young student to his pursuit than the sacrifice of his Protestant principles to attain his end, which, as he clearly saw, could alone by this means be effected in a court like that of Rome. Once at the goal of his desires,—though he did not reach the Eternal City until he was thirty-eight years of age, 1755 (he was born in 1717),—he threw himself with passion into the study of the productions of the great people with whose literature he had made himself already so familiar; guided by the dictates of a cultured mind, his appreciative and critical powers were singularly developed in this atmosphere in which, as he remarked himself, he should have been born.

Composed of six books, Winckelmann's "History of Ancient Art" embraces the whole field of information possessed by the archæological world of four generations since. The art of the principal nations of antiquity, the Phœnicians, the Egyptians and Persians, the Etruscans, the Greeks, and, finally, the Romans, is passed in review. Art, as the author shows, is but the expression of a need, and as the oldest of these expressions he places sculpture, a view which it can be seen admirably suited the theories he was desirous to expose; sculpture taken as the earliest of the arts, its rise and development are told; Greek mythology discussed; the powerful effect of climate. In his review of Egyptian art it can be understood how meagre was the information at the writer's disposal a century and more since; even more meagre is his sketch of the art of Phœnicia and Persia, anxious as he is to arrive, after reviewing Etruscan art, at his favourite theme, the art of the Greeks. Here we meet with his enthusiasm; all the political and other reasons which gave to the Greeks such supremacy are enumerated by our author with burning enthusiasm,—their freedom, their lovely climate, their physical and mental education, their cultivation of beauty, that strange and mysterious quality, an exact or even general definition of the essentials of which must, as he himself truly remarks, be classed among the truths yet undiscovered. But the expression of this beauty as depicted by the Greeks he seeks and well describes, among the gods and goddesses, learnedly and gracefully explaining the descriptive epithets which the Greeks so skilfully attached to each of their divinities. We next enter into the subtle depths of expression, proportion, and composition; a book is devoted to a lengthy and comprehensive consideration of the details of the human body as treated by the Greek artists; the tale of the decline of Greek art among the Romans closes the work.

It will be seen that Winckelmann's "History of Ancient Art" forms, as has been said of it, a vast encyclopædia of the arts of design, in which were expressed a number of views that to the critics of the last century were essentially novel. It cannot be denied that Winckelmann is not unoften curiously influenced by the spirit of that century, but, when we consider the age in which he lived, we must thank the earnest student who was able boldly to controvert so many erroneous theories current in his day. Winckelmann's "History," in fact, in spite of all that has since been written and discovered, remains essentially a classic.

To his other works scarcely less interest is attached; of his "Monumenti Inediti," published in Italian (Rome, 1767), it may be said to have done even more than his "History" to give him his position in the learned world. But the "Monumenti Inediti" is much less known than the "History"; in its pages, however, he may be said really to have established the fundamental principles of modern criticism for the interpretation of the monuments of classic antiquity,* and to have shown the world that it was not in Roman history, as was the case in his day, that was to be sought the explanation of the artistic relics of classic times, but in Homer and the traditions of Greece.

The impulse given by Winckelmann to antiquarianism was immense; a new spirit was imparted to the investigations henceforth conducted. Since his day how many names are there not which deserve mention in the great field in which he toiled so lastly, before him how few? Montfaucon, that epitome of Benedictine patience, stands out foremost, but he lived a century too soon; as for the Abbé Barthelemy,—the author of that fund of classic information, the *Voyage du Jeune Anacharsis en Grèce*,—he was Winckelmann's contemporary, like the industrious and earnest, though scarcely profound, amateur, the Comte de Caylus. But after Winckelmann the list grows. Piranesi's bold needle did its best to acquaint the world with the art of Greece and Rome; in this century, Thiersch and Meyer are names in Germany hallowed in the annals of archæology, Müller in his Handbook—well translated into English by Leitch — Gerhard and Welcker, Starke, and Kügler, and his still living active continuator, Lübke; in France, the Comte de Clarac, Seroux d'Agincourt, Beulé, Perrot, and a host of others; in England, a list whose names are familiar in our mouths as household words, Professor Cockerell, Layard and Rawlinson, Leake and Falkener, Fellows and Newton, Birch and the veteran Professor Donaldson, and many another. Times have somewhat changed since the day when poor James Millingen could scarcely find in England ten subscribers for his "Ancient Unedited Monuments" (1822), when the doors of the collections he sought to illustrate and make known were pitilessly closed to him, and he was forced abroad, where he received an enthusiastic welcome.

For this change we have, in great part, a debt of gratitude to pay to Winckelmann, by whose

* Vinet, "Bibliographie des Beaux Arts." Paris, 1874.

writings was spread more widely that taste and cultivated admiration for true art that has led in our day to such gigantic creations of but a few generations as the British Museum, the National Gallery, and last, not least, the South Kensington Museum; for Winckelmann's admirers claim for him not merely the credit due to the patient archæologist; biographers such as Mr. Lodge point to his influence for good as "a great philosophic teacher of the beautiful and grand in plastic art." Such, we must all agree, is praise that Winckelmann deserves; indeed, we are daily served with diluted Winckelmann, but that he still remains "the most trustworthy, instructive, and delightful of the masters on art," is a statement which, while it is excusable in the belief of his excellent translator, can scarcely be accepted,—in all due reverence, be it said, to Winckelmann's sacred memory,—without a wholesome reserve by the modern student of æsthetics.*

BUILDER'S MACHINERY AT THE ROYAL AGRICULTURAL SOCIETY'S SHOW, DERBY.

THE Royal Agricultural Society's Show, which was opened in Osmaston Park, Derby, on the 13th inst., contained, as usual, a large collection of engines and machinery. Amongst these were a considerable number designed to meet the especial requirements of the building trades, and whilst according a passing tribute to the very high order of excellence maintained in the agricultural section, we will here confine our attention to those machines which should possess more than a passing interest with our readers.

The largest collection of wood-working machinery was that exhibited by Messrs. Western & Co., Chaddesden Works, Derby. Here was exhibited, probably, the first saw-bench ever driven by electricity; and as this was the commencement of what probably will be in years to come an important factor in the transmission of power for driving machinery, it deserves more than a passing notice. The power was generated by a Siemens dynamo-machine, driven by a belt from an 8-h.p. portable engine. In lieu of the ordinary fast and loose pulleys on the saw-bench, an electric motor was coupled directly on to the saw spindle and connected with the generator —which was some distance off — by wires running underground. The engine being put in motion, enough power was immediately generated to allow the saw, which was 30 in. diameter, to cut with ease ordinary 11-in. deals. The importance of the application of electricity to driving machinery will more readily strike us when we consider the endless uses it may be put to in a large city, such as sawing, printing, winding, pumping, grinding, &c., the power at the same time being generated at a distance, and being distributed to its users through an ordinary copper wire. In districts where water-power is available, and where fuel is dear, an electric motor will be especially valuable; and we do not see any reason why large power should not be generated at a central station in a town, and let out to users at so much per h.p., after the same fashion as gas is sold at per 1,000 ft.

Amongst the other exhibits at this stand was a well-designed centre-feed combined planing, jointing, tonguing, grooving, and moulding machine. The framing of this machine was cast in one piece, and the timber was fed by rollers which were all geared together, thus providing an uniform feed of great power, and preventing any tendency in the wood to slip. The machine was fitted with an adjustable top, a bottom, and two adjustable angling side-cutter blocks, which operate on all four sides of the wood at once. As the wood passes into the machine it is first dressed by the revolving under-cutter, which gives it a level and firm bed on the table, and thus lessens the jar or vibration caused by the operation of the top and side-cutters; the bottom of the board is furnished by a pair of fixed irons, fitted in a movable drawer, which take off a thin shaving. The angling side-cutters in this machine are especially well adapted for working elaborate under-cut mouldings, hand-rails, &c., which can be struck at one passage through the machine; this, and the general design and arrangement of the working parts combine to make it one of the most complete machines of its class.

Another exhibit of Messrs. Western was a combination machine, or "general joiner." This is constructed, with various additions, on the lines of an ordinary rising and falling spindle saw-bench. The saw-spindle is continued and fitted with a planing and moulding block. The wood to be planed is fed on an adjustable table beneath the block, by means of rollers. The table, feed-rollers, and cutter-block are all made adjustable, and can be raised or lowered independently of each other. To the framing of the machine is fitted a vertical spindle and cutter-block for working curved or straight mouldings, sticking sashes, &c. Tenoning, mitreing, and cross-cutting slides are also fitted, and the saw-spindle is arranged for boring. A countershaft, fitted with cone pulleys for changing speeds, is attached to the frame of the bench. This arrangement is compact, but we do not like it, as the centres are too short, and the friction on the belts and bearings is thus much increased; and in practice when sawing, say above 11 in. deep, we have found much heat conveyed from the bearings to the saw, causing it oftentimes to run out of truth; the belts and bearings, too, more rapidly deteriorate.

Amongst the other exhibits at this stand we noticed various band-sawing and shaping machines, and an extremely substantial self-acting feed circular saw-bench, arranged to carry saws up to 48 in. diameter. The bearings of this machine were let in from the top of the table. They can thus be readily examined, or the saw spindle removed, which is an improvement on some older pattern machines of this type.

Messrs. Charles Powis & Co., London, exhibited several engines and a number of wood-working machines. A "general joiner," which was shown in motion, possesses several features of interest. The main framing of the machine was cast in one piece, minimising the vibration as far as possible. The various operations of sawing, planing, or moulding can be carried on together or separately, the main spindle being divided in the centre. The wood is fed through the planing-machine by a powerful arrangement of grooved rollers. The planing end of the cutter-spindle is fitted with a slot mortising apparatus, arranged with horizontal and transverse movements. The lengths of the mortises are gauged by stop-pieces. Tenons are cut in this machine by means of cutters fixed to a pair of revolving discs, the wood being cramped vertically in a slide, and passed between them. The tenons and shoulders are completed at one operation. For grooving purposes, a "drunken" saw is employed.

We also noticed a handy combined circular and band-sawing machine, for steam or hand power. It was arranged also for tenoning by means of four saws, two saws mounted horizontally cutting the tenon, and two saws mounted on adjustable vertical spindles, cutting the shoulders. Other machines were shown here, but they did not possess any special feature of interest.

Mr. R. Taylor, of Bury St. Edmund's, exhibited several of his patented circular saw-guards, which he has designed to protect the sawyer from accidents arising from the wood being thrown off the saw. The guard consists briefly of a steel shield, formed as an arc of a circle. This is suspended from a curved bracket attached to the back of the bench. The shield is held concentric with the saw by a stud, and balanced by a counterpoise. It is made adjustable both vertically and transversely, and is held true over the saw by means of small guide rollers. As the wood to be sawn is pressed against the saw, the shield rises before it, and rests on the top of it till the cut is completed, when the counterpoise brings it back to its original position.

Messrs. Smedley Bros., of Belper, exhibited a well-designed, but roughly-constructed, combined mortar-mill, engine, boiler, and barrow-hoist. These were mounted on a wrought-iron girder-frame, arranged with travelling-wheels, lock, and shafts. The mortar-pan, which was driven from below, was geared directly on to the crank-shaft of the engine, the cylinder being fixed to one of the side standards of the mortar-mill. The driving-pinion was arranged to readily throw in and out of gear, so that the engine might be used for sawing or other purposes. A very useful adjunct, in the shape of a barrow-hoist, was fixed at one end of the girder-frame. This was worked by toothed gearing, and governed by a lever, which also acted as a brake in bringing down the empty barrow. For builders in a moderate way of business a well constructed and arranged plant of the above type should be especially useful. In a future number we may notice the remainder of the exhibits that should interest our readers.

TRANSMISSION OF POWER AT TWOPENCE HALFPENNY PER HORSE-POWER PER MILE FOR PRIME COST OF PLANT.

THE correspondence which has been recently printed in the *Times* between Sir W. Armstrong, Professor Tyndal, and one or two gentlemen of less known names, on the subject of the storage, and what the writers call the electric porterage of electricity, deserves the attention of all persons interested in industrial science. We have very recently (*ante*, p. 757) as well as on certain other occasions, called attention to the subject, but the issues involved are so vast, that our readers will desire to be kept fully up to the last news. It may also be of some service to hint that even men so distinguished in science as those we have named, will do more for the world, and more for their own permanent fame, the more they confine themselves to the duty of simple reporters of facts ascertained, and the less they assume the attitude of the controversialist, and allow themselves to bring forward statements which, however correct, are practically irrelevant to the matter in hand.

Such, for example, is the comparison made by Mr. Reynolds between coal and electricity. We must observe that a somewhat exaggerated view of the results described by Sir W. Thomson is obtained by the use of the unit of the foot-pound, which may be called almost microscopic, as applied to mechanics. The English thermal unit, commonly called "Joule's Equivalent" (from the name of the man of science who arrived at its determination), is 772 foot-pounds, or 0 344 of a foot-ton. This is the quantity of heat which will raise the temperature of a pound of water by a degree of Fahrenheit's thermometer. Theoretically speaking, the perfect and perfectly utilised combustion of half a grain of carbon would develop this quantity of heat, so that Mr. Reynolds is correct in stating that a million of foot-pounds of energy (exactly 1,013,240 foot-pounds) is stored up in an ounce and a half of pure carbon. But that is a mere scientific statement, very slightly connected with the value of the Faure battery. About the highest duty hitherto obtained from coal, and that under those peculiar circumstances which allow of the great economy of the Cornish engines in the simple and regular work of pumping water, is 109 million foot-pounds to 112 pounds of coal, or upwards of 16 ounces of carbon to the million foot-pounds, instead of 1¼ ounces. Thus the comparison instituted by Mr. Reynolds starts from a fundamentally incorrect basis. As to the cost of transmission, it is, in the present case, that not of the transmission of the power, but of the apparatus including the power. That is a matter as to which much change may hereafter be effected. But it does not seem to us, as we before hinted, to come into the front line. For that electric forces will be sent about packed in batteries we regard as extremely improbable. The accumulative power, as we before hinted, is the first thing to master. Next comes the distributive power; and last of all the mode of transmitting the energy from the accumulator to the distributor.

Mr. Reynolds says, by wire ropes and by compressed air or steam, energy may be economically transmitted from ten to twenty miles. Exact data are here desirable. One of the most careful and really practical experiments ever made on the transmission of power by wire ropes was made (and we are glad to have the occasion of calling attention to the new scientific magazine, published at Boston, Mass., in the first number of which the very question of the transmission of power is dealt with by one of our contributors) by no less competent an engineer than Mr. Robert Stephenson, on the Blackwall Railway. "Over the length,"

* For further details of the interesting life and works of Winckelmann the references are numerous. Mr. Lodge's translation contains an excellent biography,—certainly the best that has appeared in English. There is also Heyne's famous "Eulogy"; see also Michaud's "Biographie Universelle"; Gurlitt's "Life" (in German); Hirsching's "German Biographical Dictionary," and Mdme. de Staël in a charming passage in her "Allemagne"; Rossetti's "Sepolchro di Winckelmann in Trieste," &c. It may not be uninteresting to add that, of the few portraits of Winckelmann, one, the work of Angelica Kauffmann, was, until very recently, if it is not at present, in the possession of M. Fuessly, of Zurich; but the most trustworthy portrait is that by Antoine Maron (brother-in-law of Winckelmann's great friend, the painter Raphael Mengs), now at the Weimar ducal palace, and which has, on more than one occasion, been engraved and lithographed.

says the article in question, "of 3¾ miles the friction of the ropes and winding machinery absorbed 251 h.-p. out of 324 h.-p. indicated, so that the force expended on the machinery was 3·4 times as much as that applied to the train." This cannot be called a very economical application of power. As to pneumatic transmission of power, there is a prohibitory limit in the conductivity of metal, and the loss or gain of heat, which is ever telling against the working power. Thus, while we must admit that the transmission of a containing vessel weighing 75 lb., for the transmission of 1,282 Joule's equivalents of heat, is in itself an economical paradox, it by no means follows that the fact that such a transmission has been accomplished, does not afford a new starting-point for the mechanic.

Sir William Thomson has not failed to call attention to the utility of that application of the electric accumulator, which we had previously indicated. He refers to a little battery of seven of the boxes described, as enough to maintain electric light to the extent of 100 candles per six hours. He also refers to the use of the gas-engine for the slow and steady accumulation of power, and, further, to that of a small portion of the steam-power of a sea-going vessel. There must be a vast number of instances in which the means of accumulating the energy of a very small, but constant, power, will produce what the mechanic requires for driving or lighting power, at little or no appreciable cost besides that of the maintenance of the apparatus.

We are, however, still of opinion that the point which, at the present moment, has the most interest for the scientific world, is the verification of the statement made by Sir W. Thomson in his letter of June 9, in which he refers, as we have more than once done, to his evidence before the Select Committee of the House of Commons on electric lighting. It is the prodigious assertion,—we can call it no less, —(if carried out it will be yet more prodigious) that "a copper wire of half an inch diameter would suffice to take 26,250 h.-p. for a distance of 300 English miles, losing so little by the way as to deliver 21,000 h.-p. at that distance. The prime cost of the copper Sir W. Thomson puts at 60,000*l.*, or less than 200*l.* per mile, for conveying this enormous energy. In fact, it comes to something under 3d. per h.-p. per mile,—and that not annual but primary cost. If anything at all approaching to this can be established, the problem of the cost of power must assume a totally different form from that which it at present occupies. The facts are so incredible (we do not say untrue, but we wait for tangible proof) that it seems there must be a mistake somewhere. But the figures stare us in the face. 60,000*l.* for transmitting 21,000 h.-p. for 300 miles. It works out 2·285d. per h.-p. per mile. We trust that we may have as good evidence offered in behalf of this view of conductivity as we now have as to the accumulative power of that form of secondary battery so lucidly described by Mr. Tyndall.

GAS-HEATED HOT-HOUSES AND GREENHOUSES.

WHEN after numerous trials, failure after failure has followed attempts to apply a principle which seemed to afford great promise, it is not to be wondered at that a popular verdict of "impossible" is recorded, further attempts are abandoned, and the idea is shelved. The heating of hot- and green-houses by gas affords a case in point. Everybody who knows anything about horticulture, cannot fail to be struck with the advantages that gas-heating would present over stove or hot-water heating, if certain defects in the application of gas to this purpose could be surmounted. Firstly, as regards stove-heating, the labour, and, more important, the responsibility and risk of stoking, especially of night stoking, would be avoided. A suitable arrangement of gas-burning having been devised and resolved upon, the entire labour of managing the calorific apparatus would resolve itself into turning on the gas at a proper height, shutting the green- or hot-house door at night, and letting things rest till morning. Secondly, a properly-devised system of gas-burning within the structure to be heated, involving, as it must, to be properly devised, a thorough and perfect ventilation, presents an enormous advantage over any other system which only secures the necessary amount of heat, ventilation being provided for by some extraneous means. It is not a matter of surprise that gas-heating has so generally failed, when we take into consideration the principles violated in this horticultural application. Universally, so far as the writer of this has seen, the mode of utilising gas for the purpose in question, has consisted in the adoption of some variety of gas-stove, yielding a smokeless flame, with no provision whatever for conveying away certain invisible and inevitable products of gas combustion. Not merely the public, but engineers, have yet to learn the potential agency of many invisible things. Beyond steam and air in motion (steam, let it be remembered, is invisible when dry), their notions of the potential agency of things invisible does not commonly go. Thus the gas engineer, when he has provided a smokeless gas-flame, and lighted it under a bath, guarantees his customer against all atmospheric foulness. If his conception of the potency of invisible things had been more profound,—if he had been brought to reflect on the restricted area of bath-rooms and the noxious emanations evolved from a gas-flame, however smokeless, he would have been more chary of his guarantee, not needing the evidence afforded by many recorded cases of asphyxia arising from this cause. About four years ago, the writer of this applied himself to solve the problem of heating a green-house by gas, and succeeded, as anybody else may succeed, by attending to what follows, and putting it into execution. He subsequently, with equal success, applied the same principle to a hot-house. The theoretical proposition was simple enough, viz., to get rid of all combustion products: the permanently gaseous ones by a ventilative current, the condensible ones by downcast tubes perforating the heating and ventilating main at suitable distances. Simple in theory, the solution of this problem was more hard in practice. Not until after many trials, and numerous failures, was success achieved. These shall be specified. The educational value of recorded failures pioneering success, is so much more valuable than a bare record of success, that it becomes a matter of regret they are not more frequently recorded.

The first resolve was to do away with any form of gas-stove. Why not burn the gas at one end of a horizontal main connected at its further end with an upright chimney? The gas-burner adopted was that commonly known as Liebig's, consisting of a drumhead of wire gauze stretched over a cylinder, left open at the bottom, so as to permit a free admixture of atmospheric air. The horizontal heat-distributing and ventilative main first tried, was made up of joined lengths of ordinary 4-in. wrought-iron stove-pipes. Though horizontal in its general aspect, downward bends or droops, almost imperceptible, were established, and at the lowest part of each a small leaden tube was fixed vertically, so as to give exit to all liquid condensed impurity. The contrivance failed ignominiously. Not only did the sulphurous acid product of gas combustion eat through the sheet iron with a rapidity altogether incompatible with every practical need, but for some reason not obvious at first, but plain enough on reflection, the system would not ventilate. On the first day of erection the draught was bad, and it became worse from day to day.

Abandoning the wrought-iron stove-pipe one of cast iron was substituted. It answered better than the first, but from some cause, not at once evident, the ventilation grew worse and worse. Being taken to pieces it was found choked with an accumulation of crystals, the mass containing a certain proportion of ammonia-sulphate and ammonia-sulphite, but still more sulphate of iron, it being well known that sulphurous acid, a first product of gas combustion, rapidly changes into sulphuric acid, and it was this which, by attacking the iron, had yielded the crystals of iron sulphate.

Yielding to this evidence, iron, both wrought and cast, had to be abandoned: equally would it have had to be abandoned for another reason, viz., the too easy heat conductibility of these materials. By accurate thermometric investigation it was discovered that all the heat for distribution had been evolved at a point very short of the upcast pipe or chimney; under which condition there was no draught, as theory indicates there could have been none. Here it may be well to direct attention to the fact that in all cases of heat distribution by tubular radiation provision must be made for conservation of sufficient heat to effect an ascending ventilative column in the upcast shaft or chimney, otherwise ventilation cannot go on.

Having abandoned iron, the third venture consisted in substituting earthenware. Common drain-pipe was tried and succeeded; but sufficient evidence has accumulated favourable to abandoning the use of any sort of tube, substituting in its place a rectangular trunk of brick or terra-cotta tiles. Many advantages suggest themselves from the adoption of this device. First, the distribution of heat would be more equal, being radiated from a larger area; secondly, the larger capacity of the rectangular tile-built chamber would nullify any back current which might be momentarily caused by a sudden gust of wind blowing down the chimney.

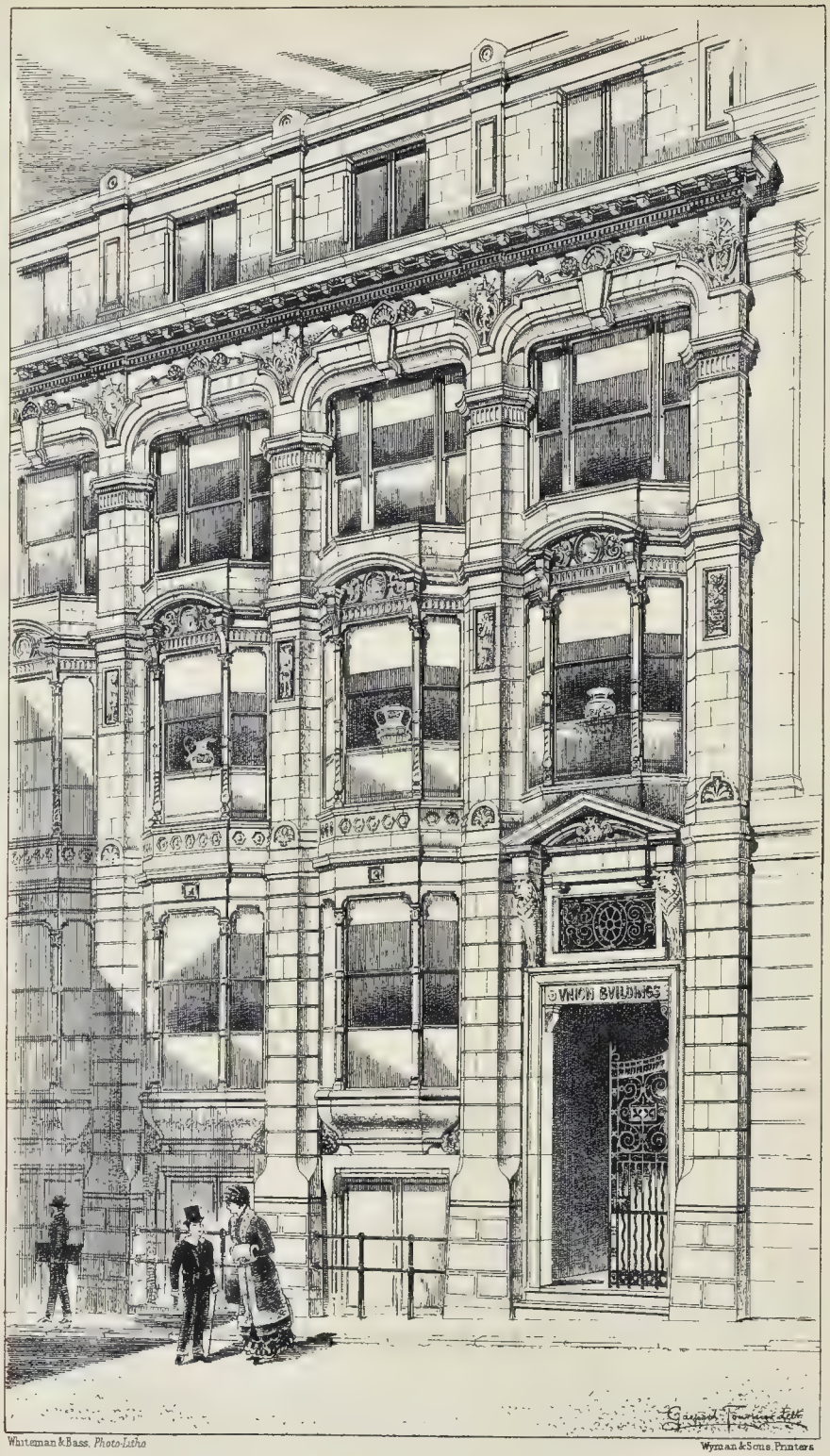
As already detailed, the result of substituting earthenware drain-pipe for iron was wholly successful; but some little points had to be studied, and the teaching of study applied before entire success was achieved. It was found, for instance, that full reliance could not be placed on a continuity of equable gas-pressure throughout the night, which difficulty was easily solved by using a gas-regulator. Again, many trials and much thermometric observation were brought to bear on the determination of best effective area of chimney gape at the out-of-door extremity of the chimney. This was accomplished by contracting the extremity of the chimney-tube with Roman cement moulded on from day to day, until a satisfactory result had been achieved. A round gape of 1½ in. was found best adapted to insure maximum ventilation with minimum loss of heat, in the case under consideration. Another detail consisted in finding a suitable material for the gas-flare to exhaust the severity of its first shock upon. An earthenware bend at first essayed for this application, was found inapplicable, on account of its repeatedly breaking. A cast-iron bell was ultimately adopted, and with success. The chemical objections to cast iron, when employed throughout the entire system, reduce themselves to a minimum of practical zero in the case described.

The fact should here be stated that the system of gas-heating now described remained under the writer's personal ken for two years, giving full satisfaction. He learns that it does so still, but the locality is many miles away, and for a long time has not been personally visited.

Finally, it will be here well to impress some pertinent facts on the memory of any one who, having perused this statement, may desire to adopt the expedient. To be successful, the underlying principles which dominate the process must not for a moment be lost sight of. It is no case for application of rough measurements or rough-and-ready workmanship. The shape as well as the dimensions of the green- or hot-house must be regarded: also its site, whether sheltered or exposed, whether there are or are not neighbouring erections, the effect of which would be to determine extraneous air-currents. The whole case must be treated as one of arrangement of a piece of chemical apparatus. But once settled, always settled. The practical working conditions of gas-heating for any particular structure having been once determined remain constant to the end.

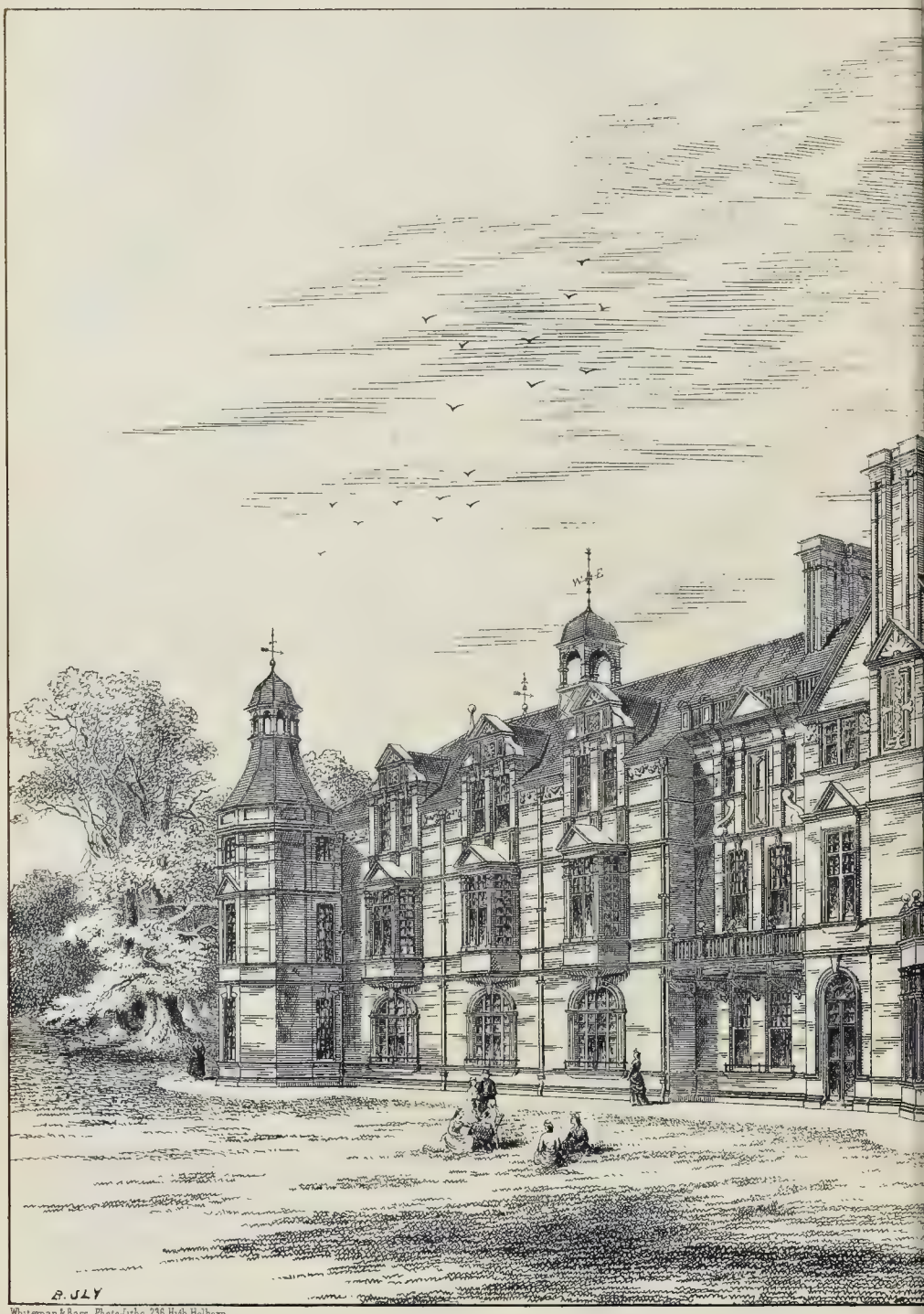
It was not a little instructive on a sharp frosty day to watch the exit chimney and note the torrents of impure watery vapour continuously discharged. Anybody seeing them would never wonder again, if he had wondered before, at the destruction caused by gas-stoves in green-houses. Equally instructive it was to note the foul acid fluid liberated by the downcast exit-tubes, and to remember that all this would have been dispersed amongst the growing plants by an ordinary gas-engineer having no knowledge of invisible combustion results.

The Sanitary Institute of Great Britain.—The anniversary meeting of this Institute was held on the 14th inst., in the theatre of the Royal Institution, Albemarle-street, Lord Fortescue presiding. There were also present Earl Bathurst, Sir F. Pollock, the Hon. and Rev. Wyatt Edgell, Dr. Alfred Carpenter, Mr. E. Chadwick, C.B., and Dr. Richardson. The chairman presented the prizes of medals and certificates which had been awarded to exhibitors of the best sanitary appliances. Professor Chaumont, F.R.S., then delivered an address upon "Modern Sanitary Science." In a general summary he asserted that the prospects of sanitary progress were, on the whole, encouraging. The dinner of the Institute was held at St. James's Hall Restaurant.



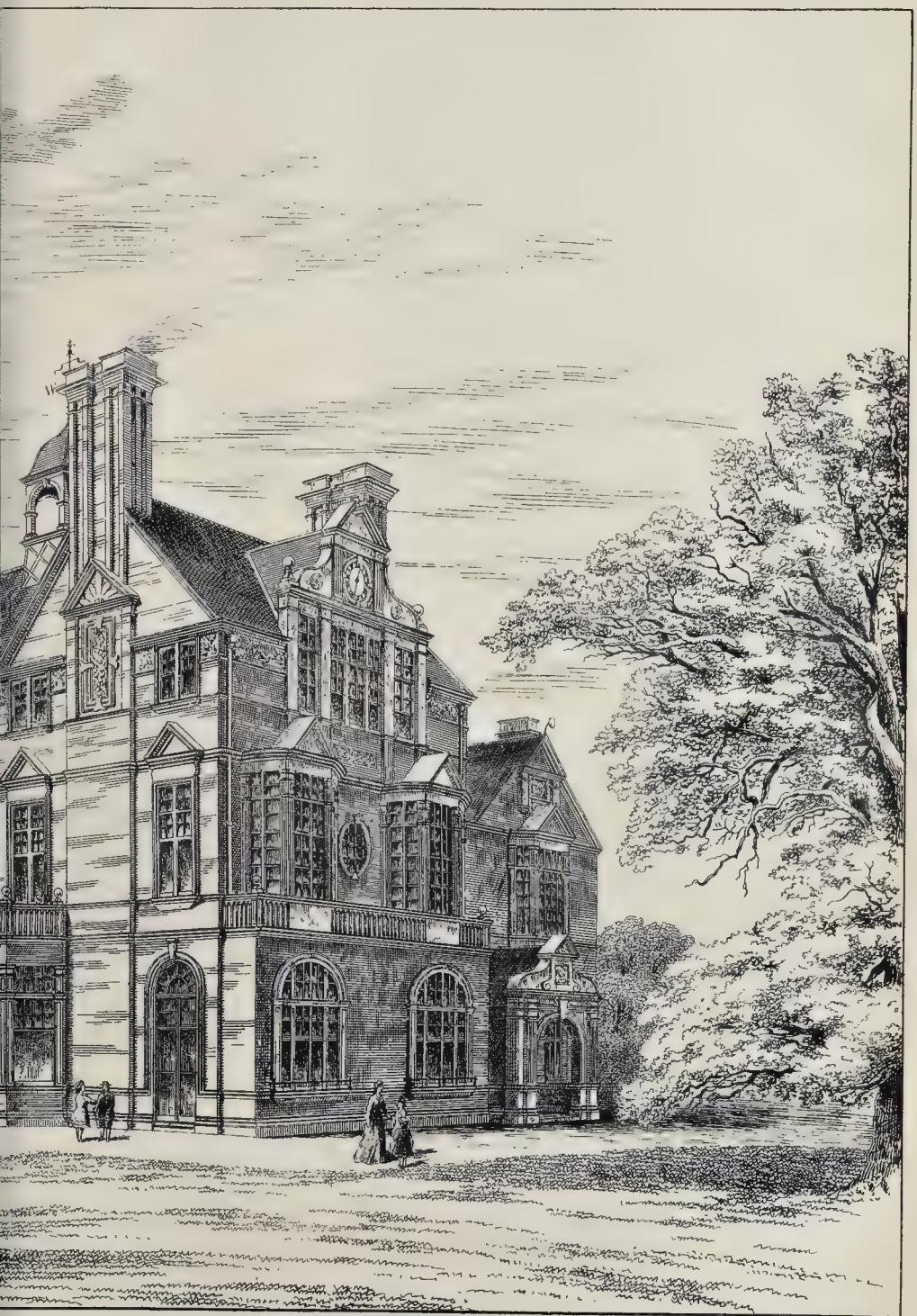
Whiteman & Bass, *Photo-Litho* Wyman & Sons, Printers

UNION CHAMBERS, NORTH JOHN STREET, LIVERPOOL.—MR. DAVID WALKER, ARCHITECT.



Whiteman & Bass. *Photo-Litho* 236, High Holborn

HOSPITAL FOR SICK CHILDREN, BR



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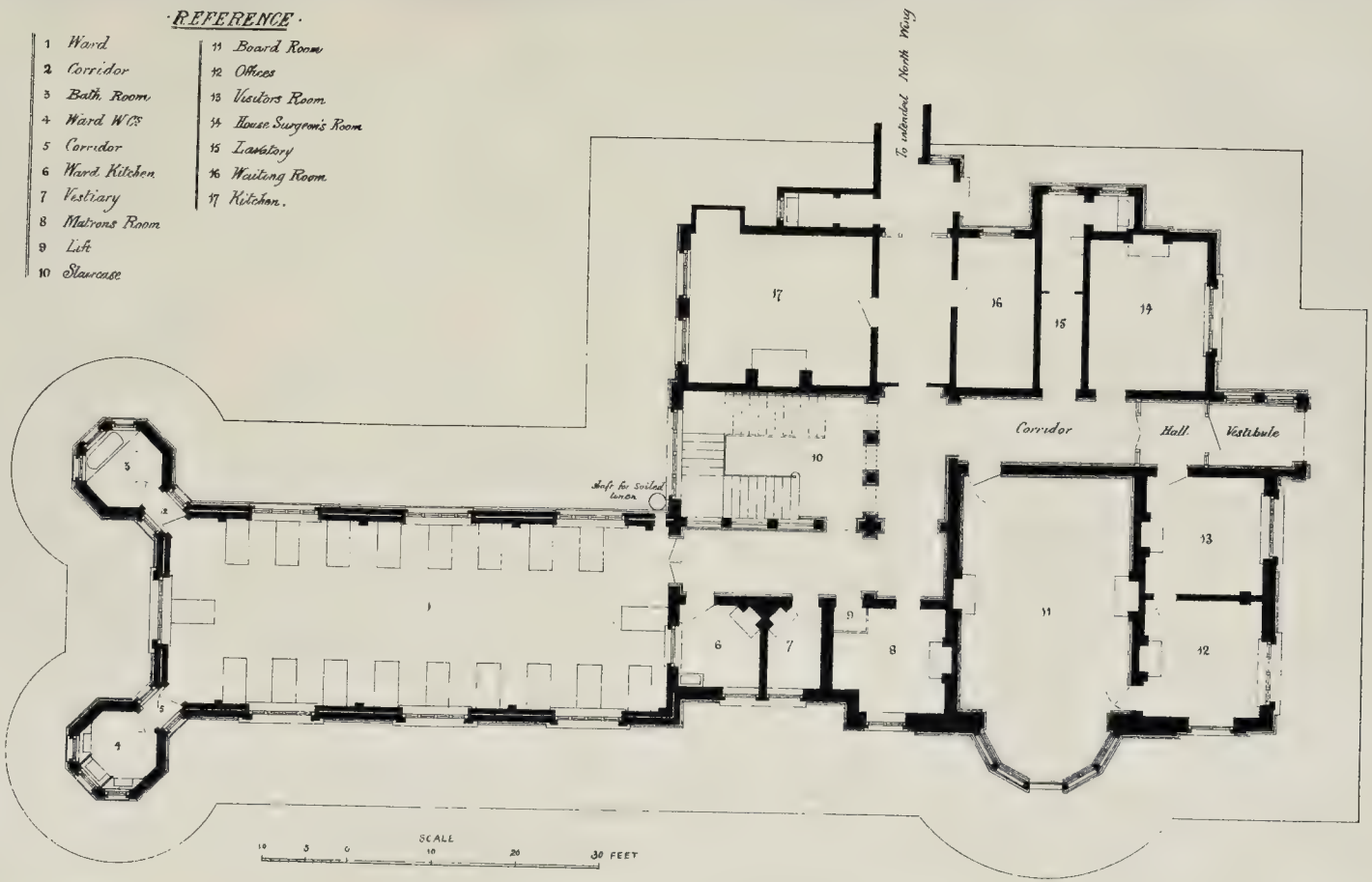
- Messrs. Lainson & Son, Architects.



THE LIEBFRAUENKIRCHE, OR CHURCH OF OUR LADY, AT TREVES : A.D. 1227 TO 1243.



ULM CATHEDRAL: THE CHOIR AND SIDE TOWERS.



Whiteman & Bass. *Photo-Litho* 236, High Holborn

HOSPITAL FOR SICK CHILDREN, BRIGHTON.—*Plan of Ground Floor.*

Wyman & Sons, Printers, G^t Queen S^t

THE HOSPITAL FOR SICK CHILDREN, BRIGHTON.

ON Thursday, the 21st inst., their Royal Highnesses the Prince and Princess of Wales opened the Hospital for Sick Children, which has been erected in Brighton. We give a view of the Hospital and plan of one floor. The building stands in about the centre of an acre and half of ground, which is the freehold property of the trustees of the hospital The site, in the Dyke-road, is surrounded with good property, and is much above the level of the sea. The subsoil is chalk; the materials used are red brick and terra-cotta. The present building consists of a south wing and a central block forming offices of administration; a north wing may afterwards be added. The building contains, on the ground floor, entrance porch, vestibule, corridor leading to staircase and inner hall office, matron's room, board-room, waiting-room, nurses' dining-room, kitchen and offices, staircase and one ward for twenty beds, house-surgeon's room. On the one-pair floor are, operating-room, ten bedrooms, one ward for twenty beds, one special ward for six beds. The two-pair floor includes one bedroom, one ward for twenty beds, and a convalescent ward for fourteen beds, making a total of eighty beds.

The lift is so placed that every floor can be served direct from the kitchen without the possibility of the smell of cooking reaching any part of the building outside the kitchen. The three principal wards are each 59 ft. by 22 ft., and 13 ft. in height, giving a cubical space to each bed of 843 ft. Each ward is warmed by a pedestal stove placed in the centre of the ward, having a fire-grating each way with downward flue, taking the smoke under the floor to a chimney-stack on the outside, common to all the wards. These fires are fed with fresh air from the outside by a flue running through the floor to underside of stove. Fresh air is brought into each ward by eight vertical flues, and the vitiated air is exhausted by means of Robt. Boyle & Son's air-pump ventilator. The w.c.'s and baths are placed in the octagonal towers, which are separated on each floor from the wards by a corridor with open windows on each side and double doors, the door leading immediately from the ward into the corridor must be closed before the w.c. door can be opened. These w.c.'s and bath-rooms are ventilated in the same manner as the wards, but separately. The ward floors are formed with Portland cement concrete and wrought-iron girders, which latter are entirely enveloped by the concrete; to avoid unnecessary weight the concrete is laid in a tubular form. To form principal floor, dovetailed fillets are let in flush with the concrete, upon which is laid a yellow deal floor, and upon this an oak floor grooved and tongued, and nailed angularly, so that no nail-holes are on the surface, thus avoiding any chance of germs or other matters finding a resting-place. The walls of two of the principal wards are lined with very large slabs of Mycene marble, highly polished. This preparation is exceedingly handsome, and almost, if not quite, non-absorptive; thus all danger of retention of germs, malarious gases, or organic matter, is avoided, as well as all painting or distempering and its periodical renewal. Want of funds prevents the adoption of this material to all the wards. To each ward is a ward kitchen and a vestiary. On the outside of the building is placed a galvanised iron tube 18 in. in diameter. This tube is carried above the eaves line and there fitted with a suction ventilator, and at the ground level is a door with open grating for the removal of the contents. This tube communicates with each ward by a small self-closing door, so that all soiled cloths, bandages, &c., may be at once removed from the wards without being carried through the building. Hot and cold water are supplied to all the water-closets, bath-rooms, and ward kitchens.

The staircase is spacious, and well lighted and ventilated, and is, with its landings, corridors, and passages, wholly of Portland stone.

The whole of the soil under the floor of the ground floor is covered by a bed of Portland cement concrete 6 in. thick, and the floor of the ground floor ward is formed thus:—First, a bed of Portland cement concrete 6 in. thick, then a layer of asphalte 1 in. thick, upon which is another bed of concrete 6 in. thick, and finally deal and oak floors in the thicknesses as described above.

The outside walls are built in two thicknesses, leaving a space of 1 in. in the centre, which is filled in with asphalte, and bound together by hoop iron, with the view of preventing internal dampness from external causes.

Internally, there will be no paint, distemper, or wall-papers.

The cost of the present erection will be between 10,000*l.* and 11,000*l.*

Messrs. Lainson & Son are the architects and Messrs. Cheesman & Co. the builders.

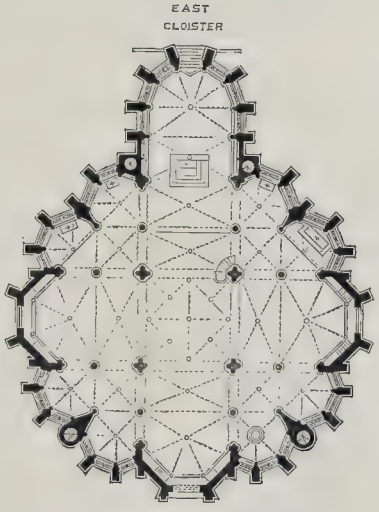
UNION CHAMBERS, NORTH JOHN STREET, LIVERPOOL.

THIS recently-erected pile of offices, the subject of our engraving, covers an area of about 130 square yards, and comprises five floors of offices, with a frontage to North John-street of 55 ft., and to Union-court of 24 ft. The depth of the land necessitated the bulk of the light being obtained from the main front, and this has been secured by the introduction of an arrangement of cast-iron oriels, carried upon massive corbels, above the basement-floor windows. Special arrangements have been made for ventilation, without dust or noise from open windows, and ample light is secured on each floor.

The materials used were Stourton stone for the ashlar, and Parhold grey stone for the rusticated base, the front to Union-court being faced with white bricks. Fireproof safes are constructed on each floor of offices, and a separate system of heating by hot water. The cost of the building was about 5,000*l.* The contractors were Messrs. Wells, of Bootle, near Liverpool, and the architect was Mr. David Walker, of Dale-street, Liverpool.

THE LIEBFRAUEN KIRCHE, OR CHURCH OF OUR LADY, AT TREVES.

THE singularly beautiful Church of Our Lady at Treves is another of those architectural puzzles with which Germany abounds: fortunately the date of its erection is known, and, according to Kugler, it was built between the years 1227 and 1243. The plan of this remarkable building is very interesting. As will be seen, the whole composition grows out of the square of the area of the central tower or lantern; from this grow out a nave and transepts of precisely similar size and plan, each consisting of two bays and terminating in three-sided apses. The choir is similar to the nave as far as its first two bays are concerned, but beyond these it is carried two extra bays, and terminates in a magnificent five-sided apse. Instead of aisles, it will be noticed, there are four square compartments occupying the angle-spaces formed by the nave, transepts, and choir. Again, filling in the angles formed by each of these square compartments, and the second bay of each of the transepts and choir, or the second bay of each transept, together with the second bay of the nave, are triangular compartments, each of which forms the base upon which a semi-octagonal apse is described. Kugler* points out the great similarity between the arrangement of this church and that of the choir of St. Yved at Braine, near Soissons.



Now as St. Yved at Braine was consecrated in 1216, and the Liebfrauen Church at Treves commenced in 1227, it is possible that they are the work of the same architect, or that the church at Treves was copied from that at Braine. Upon examining the church at Treves, one is led to the conclusion that its design was the work of two different architects,—the one perhaps a Frenchman or a German working under French art influences, and the other a thorough German. The apse of the choir, the smaller apses and body of the church generally, look like the work of the Frenchman, and are well-developed Gothic, whereas the central tower or lantern and the west doorway, which are evidently no earlier than the rest of the building, and most probably are the latest things about it, are quite Romanesque in style, and Romanesque of a decided German character, they seem, in fact, to have no connexion with the other portions of the building. The windows of this church and the columns under the central tower bear a most remarkable resemblance to those of Westminster Abbey, and the absence of the square abacus, and the fact that the arches are acute and only very slightly "stilted," seem to suggest that the architect of the church may have been an Englishman, especially when taken in combination with the fact that the architect of the clearstory and east end of the Abbey Church of St. Willibrord at Echternach, about ten miles from Treves, was certainly an Englishman.† Notwithstanding this there seems, judging from the plan, to be the greatest probability that the Liebfrauen Church at Treves is a French design.

The cloisters which unite this church with the cathedral are most singular. The windows which light them have regular three-light geometric tracery, but all the arches are round-headed,—even those of the lights. It is quite evident that they are the work of some obstinate German who, while determined lighting in the beauty of French tracery, was determined not to give up the round arch. The experiment, which is also to be seen in a pilgrimage church near Echternach, has proved beyond a doubt that Gothic tracery is ill suited to the round arch, and that windows with circular heads do not admit subdivision so well as Pointed ones.

The internal fittings of the Liebfrauen Church are interesting. The altars, with the exception of the high altar, which is a Modern Gothic erection, are excellent examples of Early German Renaissance; and there is a noble monument of the same style to Archbishop Jacob von Syrk. These probably date from about the year 1525 or 1530; the monument may be a little earlier.

Upon the twelve columns supporting the tower and clearstories of the church are paintings, life-size, of the twelve apostles, executed in the fifteenth century. From one point in the church, just as you enter it, all these can be seen together.

Architects' Benevolent Society. — A special general meeting of contributors to the Architects' Benevolent Society will be held on Tuesday, the 26th inst., at 5.30 p.m., to confirm the new edition of the by-laws, revised at the annual meeting held in March last.

* Handbuch der Kunstgeschichte von Franz Kugler. Stuttgard: Verlag von Ebner & Seubert. 1859.

† This interesting church has a clearstory and east end of pure Early English work, with mouldings and caps of the Salisbury type, triple lancet windows, and "dog-tooth" enrichments. The east end is filled up with a very large triple lancet window. The rest of the church is exceedingly early Romanesque work, except the towers, which probably date from the fifteenth or sixteenth century. This noble church had been used for many years as a china factory, but it has recently been purchased by the town of Echternach and reconverted to its original purpose. Unfortunately, the writer saw it late one evening, and there was no time to sketch it.

ULM CATHEDRAL.

IN June, 1877, the city of Ulm celebrated an event such as happens only rarely in a town of its rank. It was in the time of its growth and power that the Ulmers on the morning of June 30, 1377, laid the foundation-stone of their new parish church, which was to be the largest cathedral in Germany. A year before they had compelled the Emperor Charles IV. to a far from honourable retreat from before their walls, where he had appeared in order to force them to compliance with unjust demands; and but a few weeks prior to the solemnity connected with their church they had received the news of the victory of the United Free Cities at Reutlingen over the son of the Count of Würtemberg and the Swabian nobility. Even after, eleven years later, Count Eberhard the Greiner had asserted his supremacy in Swabia by his victory at Döffingen, Ulm continued to grow in importance. Its territory increased, trade and commerce flourished, and from that prosperous period dates the old German saying, "*Ulmer Geld regiert die Welt*" ("Ulm money governs the world"). And if, according to most recent researches, the statements, still believed in wide circles, respecting the number of population of many German towns in the Middle Ages have been proved in most cases as exaggerated, if, especially, the Ulm of that time hardly ever numbered more than 20,000 inhabitants within its walls, this fact speaks all the more in favour of the energy of that race which was able to entertain such far-reaching plans.

The erection of the cathedral was continued throughout the whole of the fifteenth century, more rapidly or more slowly according as means were abundant or otherwise; the builders being principally Ulrich, Matthäus, and Moriz Ensinger, a family of architects, as well as Hans Kuhn, Matthäus Böblinger, and, finally, Burkhard Engelberger. In the adornment of the interior rivalled with the heads of the at that time flourishing Ulm school of painters,—a Herlen, Zeitblom, Schühlein, Scheffner, — the glass-painter Hans Wild, and the wood-carvers Syrlin, the elder and younger, besides the architect Engelberger, just named. But soon after the beginning of the sixteenth century building operations stopped. The completion of the principal tower had been relinquished already in 1492, when large stones fell out of the tower vaulting. During Engelberger's direction, the tower was underpinned, and, probably, for the sake of greater safety, the two aisles were each divided into two by a series of slender columns. But in the time of the Reformation, and during the period of the Iconoclasts, far more serious and partly irreparable injuries were wrought in the interior. Thus the Dom, the most impressive monument of later Gothic, remained for centuries with the principal tower only half completed, and as well, or rather as badly, as possible, roofed over; without the choir towers, of which only the lower portion, as far as three-fourths the height of the nave, had been executed, and, together with the buttresses and piers, wanting both in security and adornment on the two long sides of the cathedral. Nobody thought of completing the latter during the seventeenth and eighteenth centuries, when bad times, worse government, and narrow views, as they began to prevail during that period in all similar communities, placed great obstacles in the way; the tendency of those troublous times showing itself also in gross neglect of the interior. Yet even in that dilapidated state their cathedral was still an object upon which Ulmers looked with pride, and a theme of admiration for the stranger, as we find in numerous testimonies of the age. Thus, Fritz Nicolai, a writer often unjustly decried, gives an exhaustive and intelligent description and criticism of the cathedral in his "Travels."

It was only in the fourth decade of the present century that the restoration of the Dom was taken seriously in hand, after, in 1817, the atrocity of whitewashing its interior had been finally committed, so that, as a contemporary account approvingly states, "people could no longer see on its walls the old paintings which often foster superstition"! Besides the sense and interest for the building as a work of art, which began to be generally awakened and was kept alive by art-lovers, the knowledge that the cathedral, if steps were not taken to prevent it, would become an utter ruin, helped much to preserve it. In the principal tower the cornice and the porch of the chief portal urgently required repair, and the erection of buttresses and pier-pyramids on both sides of the nave could no longer be postponed, on account of the threatening giving way of the walls of the centre aisle.

Thus, at first slowly, but, as means flowed in more abundantly,—especially after the success of the cathedral building lottery, — more rapidly and steadily, the works proceeded at first under the direction of the architect Mauch, next under the supervision of Thrän and his assistant Seebold, and after their decease under the guidance of the cathedral architect Scheu. An idea may be formed of the extent of the works required when we state that they included,—leaving out the repairs of the principal (west) tower,—the twenty piers and flying buttresses of the nave, the galleries over the two aisles, the eight piers of the choir, and the covered passage of the choir. The completion of the two choir or side towers has been in progress, under Scheu's direction, since 1875. We give in this week's issue a view of the towers on both sides of the choir at the south-eastern and north-eastern end of the nave. These towers will have a height of 281 ft. The southern one, completed in 1878, we believe, is shown in our illustration; that on the north side will be finished shortly. There remains the great task of completing the great western tower. This work, we are assured, together with the interior adornment of the cathedral, is being proceeded with as rapidly as safety will permit.

THE CHICHESTER AND MIDHURST RAILWAY.

IN 1864 Parliamentary powers were obtained for the construction of a continuation of the Mid-Sussex Railway from Midhurst to Chichester, to form there a junction with the main South-coast line of the Brighton Company's system. Midhurst had been before that time, and continued to be until Monday last week, indeed, a terminus of the Brighton Company. The proposed line was about twelve miles in length; the works were let and partially constructed, but were discontinued, and an Act obtained in 1868 for the abandonment of the scheme. It was subsequently revived, and the works were recommenced in 1878, and have now been completed. The line was inspected on the 24th ult., and subsequently certified by Colonel Yolland, for the Board of Trade; it has since been opened for public traffic. The week-day service, for the present, is four trains each way daily between Pulborough and Chichester,—time 1 hr. 10 min.; three between Pulborough and Midhurst,—time 27 min.; and two between Midhurst and Chichester,—time 41 min. The new line, with the Mid-Sussex, forms part of the Brighton Company's system. The South-Western Company has also a station at Midhurst, which it reaches from Petersfield on the west.

There are five stations on the new line. Midhurst, Cocking, Singleton, Lavant, and Chichester. The last is enlarged and adapted for the new traffic; the other stations are new. The old station at Midhurst will be converted into a goods warehouse. The new one is approached by a 40 ft. road from the highway to Chichester. All the station buildings on the line, which are convenient in arrangement and commodious, are from the designs of Mr. Myres, of Abingdon-street, Westminster. They are what may be called Old English in style, in red and white bricks, with stone mullions and dressings. The top story is cased with timber, and covered with panels in cement with carved floral ornaments.

The Midhurst and Singleton stations are nearly alike, and in common with the others are provided with roomy houses for the station-masters, with living-room, kitchen, scullery, pantry, and three good bedrooms. The architect has thoughtfully utilised recesses by fitting them with drawers, cupboards, &c. The whole of the internal woodwork at the stations is of pitch-pine, varnished. The accommodation for business includes a booking-office, 16 ft. square; ticket clerk's office, 15 ft. by 14 ft. 6 in.; general waiting-room, 16 ft. by 15 ft. 6 in.; ladies' waiting-room, 15 ft. 6 in. by 12 ft. 6 in.; refreshment-room, very handsomely fitted up, 18 ft. by 15 ft.; with ample accommodation in lavatories, closets, &c. The ladies' ante-room has a marble table with water-supply for two tip-up basins. The mantelpieces are of slate and marble polished. Lead-fret glazing, with cathedral tinted glass, is freely introduced. The roofs are covered with flat red tiles, and have terra-cotta ridges and finials, with the chimneys effectively grouped. The principal elevation (Midhurst station) is very good,—an open porch for the entrance being a feature. There is a roomy and light subway connecting the platforms. All the stations have covered platforms, very graceful structures, supported on elegant cast-iron columns and brackets. The South-Western Company reaches Midhurst from Petersfield to the west. The Brighton Company has made provision for the South-Western to run in on the north side of their up-platform, which is 600 ft. long. The platform roofs have zinc on their outer, and glass on their inner, slopes. The platforms are laid with Coombe rock metalling, which becomes an excellent smooth hard surface.

The line crosses the South Downs that extend from Lewes and the valley of the Ouse in the east to Salisbury and the Avon in the west. This necessarily involved some rather heavy works, including three tunnels. The first is Cocking Hill, and is 738 yards long; the summit of the hill is 92 ft. above the tunnel. The second tunnel is under Drove Park, the finely-wooded and beautiful seat of Lord Leconfield. This tunnel is 740 yards long, the ground over it varying from 2 ft. to 60 ft. The thin crust was tunnelled rather than passed in cutting, that the beautiful scenery might not be marred, or the difficulties and dangers of fox-hunting increased. This is one of the favourite covers and hunting-fields of West Sussex. The third tunnel is under West Dean Park, the property of Mr. F. Bower; it is 441 yards long, and in the centre at nearly equal distance between Midhurst and Chichester. This tunnel has, at the highest, 112 ft. of earth, &c., over it. In addition to these works there is a tunnel-bridge 49 yards long, at a point near Mid-Lavant, where the line passes under the Chichester high road. The tunnels are egg-shaped, and of five-ring brickwork. They are handsomely faced at the entrances with red and white brickwork, a 4 ft. pilaster on each side crowned with an entablature, a panelled parapet, and caps and copes of Portland stone. The most important of the station works are those that have been executed at Singleton. This will be the nearest station for Goodwood race-course, about two miles distant. The large accommodation that will be required during the race-week, and the natural formation of the ground, necessitated heavy works. To economise the space, and provide the necessary accommodation, a concrete retaining wall was built 400 yards long, 25 ft. high, with a batter of 1½ in. to the foot. It is above 6 ft. thick at the base, and 3 ft. at the top. The station buildings and accommodation here are similar to those at Midhurst; but in addition there is 500 ft. of dock-accommodation for carriages. The platforms aggregate 400 yards in length, and are 25 ft. wide. There are three-fourths of a mile of sidings, or accommodation for fourteen trains of twenty carriages each. There is a goods-shed at the end of the station, 60 ft. long by 30 ft. wide, with five hydraulics, a 46 ft. turntable for engines, a line of rails through the goods-shed, goods office, &c. There is a pumping-house at the other end of the station. The approach is by a 60 ft. road from the Chichester highway, with a separate road to the goods-station. There is ample platform and waiting-room accommodation for each sex upon both platforms. A large lavatory for gentlemen has been provided in an extra building. There is a refreshment-room upon each platform.

The gradients on the line are comparatively easy, the stiffest being 1 in 60 for a short distance; there are occasional breaks of lengths on the level. The summit, about half a mile beyond Cocking tunnel from Midhurst, is 287 ft. above Chichester, and 203 ft. above Midhurst.

There are ten over, and twenty-four under, bridges on the line. Eight of these are wrought-iron girders; five with cast-iron girders; eighteen are brick-arch bridges; two for the crossing of the highway, and one ornamental bridge for Mr. Bower's accommodation. The under-bridges are built for a single line, and are 14 ft. between the parapets, except one near Cocking, and three near Singleton, that are built for a double line, and are 25 ft. between the parapets, which are 4 ft. 6 in. high, with red or blue brick coping. All the over-bridges are built for a double line, and one north of Singleton Station for three lines of rails. All the brick bridges are single arch, with wing-walls, newels, pilasters, and stone caps.

The chalk slopes in cutting are one-half to 1, in gravel, &c., the slopes are 1½ to 1. The bases of cuttings at formation-level were 19 ft. for single and 30 ft. for double line. The sleepers for the permanent way, 9 ft. long, 10 in. by 5 in. scantling, are laid right to the 21 ft. rail. The rails are 84 lb. to the yard, and are of steel at all curves.

There is a fair proportion of the line on embankments, from which charming views are obtained. Between Midhurst and Cocking, for instance, there is an embankment two miles long. Cocking station is high, and close to the South Downs, and very extensive views of hill and dale, wood and water, can be commanded from that and other points; some of them taking in the Isle of Wight, Hayling Island, and other places on the coast. Near Cocking the Crypt ravine is crossed by a short embankment 56 ft. high. Between Drove-tunnel and Singleton station glimpses are obtained of the grand stand and the hill at Goodwood. The station platforms at Singleton are on an embankment 20 ft. high, from which also good views are commanded, amongst others over a part of West Dean Park, the seat of F. Bower, esq. The grounds are extensive, and laid out with great taste. West Dean House, a large mansion, is an interesting curiosity in building. The front is built entirely of flints dressed with sharp arrises. The ornamental bridge, built by the company, to connect Mr. Bower's severed property, is opposite his gates, and is built of red brick, with white brick facings, Portland stone caps, and ornamental panels of flint-work in the pilasters and parapets. At Mid-Lavant the line passes close to the churchyard where the celebrated author, divine, and controversialist, Dean Hook, of Chichester, formerly Vicar of Leeds, was buried. About a mile from Lavant, Chichester Cathedral and spire are sighted, and at the end of another mile Fishbourne signal-box is reached, and the line curves round and runs alongside of the South-Coast line for about three-fourths of a mile, to form a junction with it at Chichester station. A new goods station has been built here 145 ft. long and 35 ft. wide.

At Cocking, where the line intersects Lord Egmont's property, special works were constructed, to enable his lordship to quarry chalk from both sides of the line, and to convey it to the station.

A good deal of useful material was obtained from the line. Abundance of excellent sharp sand was taken out. From a cutting at Lavant the whole of the top-ballast for the line was taken, as also for the concrete wall at Singleton. For this the gravel was not only well-screened, but thoroughly washed in the stream. It was made up with blue lias lime. The bricks for the tunnels and bridges were made by the contractor from clay got from the line, and from a field belonging to the railway company. They were all made by machinery in the contractor's own brickfields.

The principal landowners on the line are the Earl of Egmont, Lord Leconfield, Mr. F. Bower, the Hon. and Rev. A. Legge, the Bishop of Chichester, and the Hon. Vernon Harcourt; these eminent personages may be expected to put a good deal of traffic on the line in valuable timber, and other woodland and agricultural produce. Great quantities of copse wood and willows are produced in the district for conversion into baskets, cask-hoops, wattles, &c. A great deal of charcoal is also made in the district.

The line was laid out by Mr. F. D. Banister, engineer-in-chief of the Brighton Company. Mr. Horace J. Mannering has seen the works carried out as resident engineer, with Mr. J. Phillimore as clerk of the works. Mr. T. Oliver, of Horsham, has been the contractor; the arrangement of the points, signals, and signal-boxes has been intrusted to Messrs. Saxby & Farmer the well-known signal engineers.

Art Loan Exhibition at Windsor.—On Monday last H.R.H. the Princess Beatrice opened an Art Loan Exhibition at the Albert Institute, Windsor. The exhibition includes works by Rubens, Michelangelo, Titian, Canaletti, Gainsborough, E. M. Ward, Gustave Doré, Greuze, E. W. Cooke, R.A., D. Maclise, R.A., Van Beest, Sir Joshua Reynolds, Romney, H. Vernet, Constable, Sidney Cooper, Cattermole, and others. Her Majesty contributes a series of water-colours by Paul Sandby, chiefly of views of Windsor Castle and precincts, date 1750 to 1780, and several works by the same artist are contributed by other residents in the town.

KESWICK.

EXCEPTING only one word, Bunyan's description is applicable, for it is in a "most pleasant, mountainous country, beautified with woods, vineyards, fruits of all sorts, flowers also, with springs and fountains, very delectable to behold." It is out of the course of great trades, and hence there are not the impulses to progress other places know, but it is in the path of the pleasure-seeker, and it has known a little of that steady growth which has set in, since by the growth of communication and the distribution of wealth, Lakeland became the holiday haunt of Britain. Compare Keswick of the past with that of the present, the town before its railway era with that we know, and it will be seen that it has gone "down the ringing grooves of change." A little more than twoscore years ago, when the Derwentwater estates had just been sold by the Greenwich Hospital Commissioners, Keswick was composed of one long and stony street; it had a manufactory of coarse woollen cloths and a smaller one for the fabrication of finer textures. Upon the Greta there was a forge, and tools, spades, and similar articles were made,—lead was worked and pencils made, and there distinctive industry ended. The population of the place was 2,159; the Derwentwater had pleasant seats and residences on its bank. There were seven or eight pencil-makers; two inns only were named, but there were eighteen taverns and beersellers. A coach did duty for passenger traffic, two mail gigs conveyed letters and parcels, and three carriers were then unabolished. In the list of residents, occurs that of "Robert Southey, esq., LL.D. (poet laureate), Greata Hall," lighting up the undistinguished ruck of "nobility, gentry, and clergy." In a few years, Southey has passed into his rest with most of his contemporaries, and something has been done by the extension of the railway system towards making a city of what was his solitude, and the Keswick of the present is widely different from that of the past.

One of the boasts of Keswick now is its local organ, and that guardian of the interests and chronicler of the doings of the town can tabulate for the capital of Lakeland half a dozen churches, chapels, and meeting-rooms; can record at length the doings of its local bodies and the result or accompaniment of their labours in a very diminutive death-rate, as well as place upon its page the changes in the trade of the town; but probably in nothing is the change better exemplified than in the fact that the town is now brought within a limited distance, so far as it is measured by facility and quickness, of communication from most of the great centres of population in the kingdom. In that extension of railway facilities, not only has the town of Keswick been benefited, and the district of which it forms a part, but the benefit has been reciprocal, and one of the great pleasure spots of the kingdom has been brought within the reach of the many, instead of the few. The result has been to swell the demand in Keswick for that accommodation which has become necessary, and to give to the town the element of growth it had not previously known. It is not that in population it has known the progression of a Chicago, but in the intervening years there has been a steady accretion of population, and the town has struck out its little shoots and additional streets, and is still sending them out, and names them after its great poet, after its hills, and after other of the things it prides itself on. And, coupled with this, it has added to the neat mansions that are on the shores of Derwentwater; and it has increased its hotel accommodation by the addition of stately structures that compare well with the older inns of the past. Its industries have not increased: pencils are still one of the special manufactures, and lead is mined, at and near it; but agriculture around it, and the preparation for, and the reception of visitors, as well as their comfort and their conveyance, support the little town of beauty. It runs its seven coaches daily to Windermere; its hotels are very many in proportion to its population, but they are pleasant places of rest and refreshment,—solid as well as liquid,—instead of the bars and gas, glitter and gin, that dominate in some of our great cities. In Keswick the advantages of association are known; for roads and for recreation, for the cheap waterworks of the Local Board, for literary associations and scientific societies the townsmen unite in an endeavour to make their town and district more enjoyable to themselves, and more attractive to visitors. Thus in that beautiful spot of England, which Cumberland and Westmoreland enshrine, Keswick is the acknowledged capital; and of the days of a man's life, few are more pleasant than in that "land of streams," which poets have sung of, which painters have depicted, and which presents, long after the visit, its hills and dales, its streams and lakes, to the memory. Keswick has grown comparatively great: the growth of its hotels, its lodging-houses, its coach accommodation, the fleet of boats that press the dark bosom of Derwentwater, and the villas that stretch along the side of the lakeward roads, all point to that growth. In the past, hotels such as that of Lodore would have been impracticable, for the guests could not have been conveyed, but now rapid and cheap communication seems likely to make a city in the solitude of some of the lakes. And with the careful sanitation which Keswick shows, with its abundant supply of purest water, with a Local Board that fulfils the duties attached to it well, there should be in the future a continuation of that growth which the past has known. The benefit of these retreats from the world which is "too much with us," and that from the occurrence of that holiday, which may be called, in Dickens's words, a "happy, unsubstantial idle time," cannot be overrated, and it is well for us that "the unconquered arm" of steam has enabled the beauties of the Lake district to be placed before all classes. Our health resorts need especial care, that they may be fit for their use; that they shall be cities of health; and that all the conditions that are essential to health restoration and to the enjoyment of the cases in time shall be presented by them. It is because it has appreciated this, and because it endeavours to carry it into practice that the pleasant little town of Keswick has grown of late from the smaller secluded Paradise Southey knew. And if it may have lost one or two of the charms which to some natures seclusion gives, it has far more than counterbalanced these, and that especially in the benefit that it gives to the swollen streams of visitors who make it head-quarters for tours from lonely Wastdale to fair Bassenthwaite.

WIND PRESSURE AND WIND MOVEMENT.

THE subject of wind pressure has been recently discussed by the American Society of Civil Engineers. It may be in the remembrance of our readers that in some of our own remarks on this important subject, especially with reference to the great estuary bridges of Scotland, we spoke of the large allowance for this element of stress that was made by American engineers. The Institution, however, is not satisfied with the actual state of scientific information on the subject, and has recommended further experiments. One or two very remarkable facts were brought out in the discussion, with reference to which, however, it may be questioned whether in an island of the size of Great Britain it is reasonably probable that a tornado could attain the fury with which blasts of that nature have been known to sweep over large districts in America, and also in India.

One of the remarks of the American engineers is to the effect that the speed of the wind is at times much greater at 100 ft. or 200 ft. above the ground than it is on the ground itself. We think it is undeniable that this may, at all events at times, be the truth. We have estimated the movement of clouds at thirty-five miles an hour, when the movement of wind shown by an anemometer was very considerably less. It is in accordance with the properties of a fluid like the air that it should *drag* over the ground, running over itself, and flowing at a much greater speed at a distance from the cause of frictional resistance. It follows that an allowance of from 30 to 50 per square foot, which is common in America for bridges, ought to be considerably increased for a lofty viaduct. Near the eastern end of the Great Bridge at St. Louis it is stated that a tornado actually lifted a locomotive from the rails, without damage to the way, and deposited it in a ditch by the side of the line.

The Marshfield tornado was a well-known storm in the United States, the track of which was followed by Mr. Shaler Smith for forty-six miles. The track was about 1,800 ft. in width, and the tornado developed a lifting force of 58 lb. per square foot. A small house, with 13-in. brick walls, was levelled to

the ground by this tornado, and a piano standing in it was lifted by the wind and conveyed for a distance of 270 ft. In the Saint Charles tornado a lifting power of 85 lb. per square foot was developed, but the track was not more than 60 ft. wide. It passed through the centre span of the St. Charles Bridge, and took up a barrel of tar which stood there, which it burst to pieces. In the route of this tornado the walls of the houses that were overthrown usually fell outwards, showing that a vacuum followed the burst of the storm, and that the expansion of the air within the house was the cause of destruction.

It must be remembered that the normal atmospheric pressure is not far short of a ton per square foot (at 15 lb. to the square inch it is 2,160 lb. to the square foot). Thus the reaction, or rush of the atmosphere to fill a vacuum caused by a tornado, is likely to have a far more rapid action, and thus to be more destructive, than the direct force of the storm itself. Some remarkable instances of this have been mentioned by us in our recent papers on lighthouses, and we cited a case where cast-iron doors, at a considerable height above the sea, were burst open outwards by the vacuum caused by the fall of a heavy wave around the tower. Whirlwinds and waterspouts at sea develop phenomena of a similar nature to tornadoes by land, and may be more conveniently studied. The writer of these lines on one occasion counted as many as fifteen water-spouts in one day over the Bay of Naples. From the top of Hermon, in northern Syria, the sandy waste to the east of Jordan may be seen to be traversed by whirling columns of sand,—the water-spouts of the desert. The whole subject is one of deep interest, for the physicist as well as for the engineer, and is one which we shall rejoice to find treated with an exhaustive care befitting its importance.

AN OLD-FASHIONED SUMMER.

SUMMER is upon us, with its old-fashioned intensity. Without any attempt to discuss the thorny question of the displacement of Saints' days, and other calendar dates, first by the slow changes of sidereal movement, and then by the acts of Popes and of Parliaments in the reformation of the calendar, we may venture to record the occurrence of a St. Swithin's day without rain,—if not without cloud. And the difficulty as to the adjustment of the calendar does not interfere with the fact that the weather which prevails when the sun has advanced some two-thirds through the sign Cancer, is generally steady and durable, for a month or more, whether it be wet or dry.

With a dry July we are enjoying a hot one. As a rule, July is the hottest month of the year. But then, also as a rule, it is one of the wettest. Mr. Symons, who may be said to have succeeded St. Swithin of Mediæval times, and Aquarius, of the Classic era, as president of the weather, tells us that "July, August, and October appear to be the wettest months at most stations, but that in mountainous districts December, January, and February are far wetter than any others. In fact, the seasons appear almost reversed." In 1880, 5·11 in., or rather more than a sixth of the whole rainfall of the year, fell in July, during which month rain fell on twenty-three days. The mean temperature of the dry-bulb thermometer was 61·7° Fahr. The maximum heat was 75·5°, the minimum 48° Fahr. This temperature of last year was almost exactly the mean temperature of July for the past twenty years, which is given by Mr. Plant, of Moseley, near Birmingham, as 61·6° Fahr. In eleven out of the last twenty summers, July was the hottest month. At the close of the present July we shall probably find the average of 61·6° to have been considerably exceeded. Nor is the heat local alone. It seems to be general in its distribution. In the United States sunstroke has made numerous victims. At Florence the thermometer has reached 99° Fahr. in the shade. On the 15th of July the temperature stood in the Strand at 95° Fahr. in the shade at one p.m, and later in the afternoon at 98° in the shade, and 123° in the sun. At five p.m. the shade temperature was 90° Fahr.

Glorious as the weather is for the corn-crops, it is not unattended by much personal suffering, especially for the residents in the metropolis and other large centres of population. Nor is it a question of comfort or discomfort alone. The death-rate becomes unusually high. The journals teem with complaints as to London smells. The intolerable character of the tepid water which is drawn from so many neglected cisterns leads to new essays to improve the water-supply of the metropolis. We are not undervaluing the need of reform in this respect; but we cannot too loudly call attention to the domestic cisterns. We would recommend every householder to see that the cistern or cisterns from which he draws any fœtid water are thoroughly and effectually cleaned out, so that at least we may not make use of water more impure than that which flows from the mains of the companies.

It is refreshing, in such weather, to hear what Liverpool is doing to provide for the wants of her 550,000 inhabitants as to water. Within the last ten years she has added 60,000 souls to her population; and Rivington Pike no longer suffices for her mains. At a distance of sixty miles from the head spring of Severn, the river Vyrawy, after a course of thirty-five miles, falls in on the left bank. It is a mountain stream, formed by the union of a multitude of branches, and drains about 350 square miles of mountainous and little-peopled country. The waters of this stream and its affluents will be impounded at Llanwddyn by a vast dam of 1,255 ft. in length and 140 ft. in extreme height, raised across the valley. A lake of some five miles long, with an area of over 1,100 acres, will thus be formed, and a triple row of pipes of 60 inches diameter will be laid to convey the water to Liverpool, at the distance of seventy miles. The supply is calculated at 52,000,000 gallons a day.

As to London, pending the re-introduction of any measures into Parliament for the regulation of the water supply, attention is now being invited to the application of Dr. Clark's process for softening the water already supplied. The water of the several metropolitan companies (in the year 1877) varied from 12·9° to 13·8° of hardness on Clark's scale, with the exception of the Kent water, which has a hardness of 19·1°. This hardness, however, is reduced by boiling to from 3·1° to 3·6° in the case of seven companies, and to 5·6° in the case of the Kent company. A committee has now been appointed to collect and spread information on the subject of the application of Clark's process to the softening of the metropolitan water, and the Chelsea company, which made experiments on the subject in 1851, are to be applied to, to renew their experiments. The degrees of hardness are equivalent to the number of grains of bi-carbonate or sulphate of lime contained in a gallon (or 70,000 grains) of water. At or below 6° of hardness, water is regarded as soft. Above that, it is called hard. There is no doubt that the process may have the result of removing all the chalk in excess of 1½ grains per gallon from the water treated. The practical difficulties of the operation, however, are considerable. The pipes conveying the water treated become choked with a mass of minute crystals of carbonate of lime. And it was reported in 1851, by a chemical commission appointed to consider the value of the process of lime purification, that even when combined with filtration it was insufficient to remove the yellow tinge of Thames water during flood, nor did it appear to abate an objectionable taste of vegetable matter which the water also possessed at such times (see "Water and Water-Supply," p. 47). As the water of all the other companies, not even excepting the Kent, becomes soft by boiling, and as for culinary and washing purposes water is usually boiled, it hardly seems to us that it is by way of introducing the lime process that the most practical reforms are to be made in the London water-supply. If the committee were to turn their attention to a house-to-house inspection of cisterns, we think that much more utility might follow their labours.

Meantime the demand for water steadily increases. The population of London (vol. xl., p. 719) is now 3,814,571. This requires, according to the present rate of allowance, an annual daily supply of 122 million gallons, and a daily supply during such a month as the present of more than 140 millions of gallons. In July, 1859, the daily flow of the river, for the average of the month, was not more than 422 millions of gallons, so that London wants already to drink a third of the summer flow of the river. What does an abstraction of this magnitude mean, unless it be accompanied by those precautions as to purity of which we talk so much and accomplish so little? Let any tourist look at the water of the river Wey, as it passes under Guildford Bridge. Let him reflect that it is on its way to its junction with the Thames, above the intakes of the Metropolitan Water Companies. What reflections he will then make we do not now offer to guess. But a thermometer at from 80° to 90° indicates a state of the atmosphere in which impure water becomes something more than disagreeable, and tends to the conclusion that a death-rate of 20·1 is, after all, much lower than might easily have been caused.

"A DAY IN THE COUNTRY."

"Help me to give the poor children of my parish a day in the country."—*Ecclesiastical Circular.*

THE benevolent clergyman who discovered the meaning of what his agricultural parishioner intended by "nailing a mossifer," and has made known to the world that to "nail a mossifer" means to inhale the atmosphere, could, if he would allow his benevolence to extend its influence a little farther, tell us many a story of the happy healthful results of "a day in the country."

At this season of the year every post carries urgent appeals to the charitable on behalf of the children of our terribly overcrowded neighbourhoods, calling upon us all to help in affording the poor little ones the means of enjoying the pure air, which, it has been said, is alone to be met at a distance not less than ten miles from London. It is true that the metropolis is every year becoming a very much greener place than it has been in the memory of old Londoners, and really at some portions it seems again to be returning to the appearance that antiquaries tell us Cheapside and the City presented in the seventeenth century, when the fig-tree and the vine were conspicuous in the heart of London. The last space lately opened on the Thames Embankment, beneath the shadow of the Victoria Tower, and fitly named Victoria Gardens, promises to be a great boon to crowded Westminster. But even these open spaces, much advantage as they afford to the little ones, and which are, indeed, sufficient to remove those absurdly exaggerated statements that horrify one occasionally by the information that thousands of young people are brought up in London who have never seen a green tree or a blade of grass, are yet very insufficient to afford the delight, the health, or the influence on the imagination of a lovely luxurious meadow, with its splendour of buttercups, or, later on in the year, its rosy-toned clover, or the mystery of the tree-shaded woods, the variety and the beauty that are associated with a hedge-row.

A little of this enjoyment and advantage may be obtained even by a day in the country, a day passed within ten miles of London, but it is a question whether very great good to the health of a child is gained by merely one overcrowded day of enjoyment passed in the country; let there by all means be as many days as we can spare at this or any season of the year, and let us do our best to aid that more liberal, more sensible project which we are happy to see has already taken a very definite form, of allowing our overcrowded districts to send their little ones for at least a week into the country. Then we should see the gain to happiness and morality secured by that indirect influence on the health, which acts through the mind from the recollection of happy hours and agreeable memories, memories of the novelty of first impressions during hours and days of monotonous routine.

A day in the country is scarcely sufficiently distant from the heart of London to secure the pure air which we all sigh for; a day with its heat and excitement compressed into a few hours does not suffice for the good that we all of us desire that the mass should experience, but a week, a whole week in the country, what health, what memories, what good may not result from such an experience. How many are there of us who cannot look back to our own recollections of a week in the country, the memory of which will never fail us as long as we live? How often have we, whose lives are passed in London, not rejoiced to see our little ones return happier, more beautiful than when they left a week before, more fitted, because happier and stronger, for the wear and tear of daily life. But this happy result we must confess has generally been in the return from the seaside, where the invigorating influence of the air, of bathing, is even greater than that of the surrounding greenery afforded by an inland stay in the country.

Mr. Mark Fisher has been elected a member of the Institute of Painters in Water-colours.

THE CAMBERWELL NEW FIRE BRIGADE BUILDINGS.

THE Camberwell Fire Brigade Station in Peckham-road has just been rebuilt, by direction of the Metropolitan Board of Works. The station, until recently, was limited to the ground-floor for the engines and offices, with two or three apartments above. The building has now been carried up to a height of about 50 ft., and consists of three lofty floors, containing large and convenient apartments for the officers and men belonging to the brigade. The building, which has a handsome elevation to Peckham-road, is faced with white Suffolk brick, and stone and red brick dressings, and is relieved by ornamental bands in terra-cotta. The elevation is surmounted by a lofty gable, with bold stone coping. At the rear of the building there is a tower and look-out, rising to a height of 80 ft., and commanding an extensive view around the metropolis, from which a fire raging in any district may be easily seen.

The building has been erected from the designs of the Metropolitan Board's Architect. Mr. Taylor, of Brixton-road, was the contractor.

GREAT COST OF THE LONDON AND NORTH-WESTERN COMPANY'S GOODS STATIONS.

MR. GEORGE FINLAY, general manager of the London and North-Western Railway, who was one of the principal witnesses examined last week, before the select committee of the House of Commons now sitting on railway rates and fares, incidentally stated some important statistical facts as to the cost of the goods stations belonging to the company in London and several of the large towns. He said that in providing goods station accommodation the North-Western Company had spent 2,300,000*l.* in London; 812,000*l.* in Manchester; 280,000*l.* in Birmingham; and 1,913,000*l.* in Liverpool; and that these sums were altogether exclusive of the immense amounts which the company had expended in passenger stations in those towns. The sum actually expended in providing goods stations in Liverpool was twice as much as was required originally to construct the Manchester and Liverpool Railway. He added that in addition to the expenditure which the company had incurred in the construction of these large stations, they had also to provide an enormous mass of sidings for the reception of train loads. At Willesden they had provided twenty miles of sidings, and at Edge Hill, Liverpool, thirty miles; and they had in course of construction at the latter place another eight miles.

THE NEW FORTH BRIDGE PROJECT.

IT has at length been decided that the construction of the great bridge across the Forth shall be proceeded with, notwithstanding that a Bill authorising the abandonment of this stupendous undertaking, has already passed the House of Commons. At a special meeting of the shareholders of the Forth Bridge Company held last week, the chairman, Sir James Falshaw, presiding, it was resolved to withdraw the Bill from the House of Lords, and to proceed with the erection of the bridge. At this meeting the chairman of the company observed that the Bill for the abandonment of the scheme had been opposed by the three southern railway companies —the Great Northern, the North-Eastern, and the Midland—who were not satisfied that the bridge could not be built, thinking that the construction of the bridge was practicable. He added that they had submitted it to the engineers of their respective lines, namely, for the Midland, Mr. Barlow; for the Great Northern, Mr. John Fowler; and for the North-Eastern, Mr. T. E. Harrison. These gentlemen had examined the ground, and looked at all the circumstances, and the result generally was that the bridge, as designed by Mr. John Fowler, was the one that had been looked upon with the greatest favour by the companies. He then further stated that the directors had come to the conclusion that it was best for themselves and the shareholders to withdraw the abandonment Bill, and that to meet the expense of constructing the bridge, which was estimated at 1,370,000*l.*, the four railway companies—the Great Northern, the North-Eastern, the Midland, and the North British—had agreed to guarantee two millions sterling, and the shareholders who had already entered on the scheme were to be guaranteed 4 per cent. The guarantee is apportioned as follows:—North British, 30 per cent of the whole; Great Northern and North-Eastern jointly, 32½ per cent.; and the Midland, 37½ per cent. It was unanimously resolved to withdraw the abandonment Bill, and the construction of the bridge is to be proceeded with according to Mr. Fowler's design, which, the chairman said, had been approved by Mr. Barlow and by Mr. Harrison, who had both expressed their opinions to him that it was a thoroughly substantial bridge, not a suspension bridge at all, but what was called a continuous girder bridge. The chairman added that he knew Mr. Fowler to be about the ablest man they had in the kingdom, and if any man could build a bridge like that, which should be permanent, which should endure as long as the railways lasted, Mr. Fowler was the man to do it.

FROM FOREIGN AND AMERICAN SERIALS.

ITALY.

Giornale dei Lavori Pubblici (Rome, July 13). The late serious accidents to workmen, especially in Rome, have directed public attention in Italy to their protection from the carelessness or niggardliness of their employers; and an article in this number gives a sketch of the measure introduced by the Government for this purpose, and which is expected to pass the Italian Parliament. Its provisions are very stringent. The responsibility of all accidents in buildings, mines, quarries, or workshops, is laid upon the contractor or proprietor; and it is for him to exonerate himself by proving that the misfortune was due solely to the negligence of the person injured, or to unavoidable causes. If he proves contributory negligence, the fact is to be considered in fixing the indemnity; but otherwise, the workmen injured are to be compensated as follows:—For temporary disablement, full wages until recovery; for total and permanent disablement, three years' full wages; in case of death, one year's full wages to childless widow; half wages until the children are grown up, to widow with children; two-thirds to widow with children, where there are also dependent parents; three years' full wages to childless widow and dependent parents. These sums may be transferred to benefit societies, and recovered by them. When an indemnity is decreed, it is to be paid at once, even when an appeal is pending. Workmen cannot contract themselves out of the provisions of this Act. Although this law (if passed) will be severe on contractors and employers generally, it is considered that their past negligence has justified strong measures; and the *Giornale* points out that they can protect themselves by means of accident insurance, which is a new thing in Italy, having only been introduced within a few months by a single company.

AMERICA.

The Scientific American (July 2).—This number contains details of the Storer Garbage-cremating Furnace for the consumption of town refuse. It consists of a brick-lined cylinder about 60 ft. long and 6 ft. in diameter, having an incline of about ½ in. to the foot, which is caused to rotate by a wheel and screw. At the feed end of the cylinder is a fireplace, in which the pulverised fuel used in the operation is ignited. At the further end is a combustion-chamber, in which the gases are decomposed, previous to their escaping by the smoke-stack. The garbage, passing through this cylinder, is exposed to the flame generated in the fireplace; and is either dried for use as manure, or burnt to ashes, according to the length of the time which it occupies in passing through the cylinder. This is regulated by the speed at which the cylinder revolves. It is calculated that a furnace of this size will consume 350 loads of garbage in one day.

The Scientific American (New York, July 9.—An interesting note on the history, composition, and preparation of water-glass is to be found in this paper.——A flagstone, 25 ft. by 15 ft., has been cut at Waterville, N.Y., for which $5,000 has been offered, delivered in New York. As, however, it is too large to be carried by railway or canal, the question of the means how to remove it, seems to be a problem not easy of solution.——The roofing-slate industry in America, which ten years ago was not of sufficient importance to be mentioned in the census returns, now employs 3,000 men and $8,000,000 capital. Last year 600,000 squares (of 100 ft.) were produced, of which more than half were raised in Pennsylvania. The blue-black slates, from Maine, are the most durable, and are said to rival best Welsh. Green, purple, red, and variegated slates are also found; but the colour does not last.

COMPETITION CARDS.

THE competitive designs for Christmas and New Year cards now on view at the Egyptian Hall, sent in by 879 competitors, and some 3,000 in number, include some very excellent work,—better, indeed, than any we have before seen applied in this direction. The judges, Messrs. G. D. Leslie, R.A., Briton Riviere, R.A., and W. Hagelberg, of Berlin, have made their award, we are told, but it will not be published until Monday next. Twenty of the sets are to receive 1,000*l.* between them, and fifty other sets are to be selected at 10*l.* per set. Judging from advertisements from dealers in Christmas cards, and the money paid by some of the firms who do not advertise, the trade in them must be enormous.

SALE OF THE LATE SIR CHARLES REED'S MANSION AND GROUNDS, TOTTENHAM.

A NUMEROUS company was attracted to the Auction Mart, on Tuesday, by the announcement of the sale by Messrs. Debenham, Tewson, Farmer, & Bridgewater, of "Earlsmead," Tottenham, the freehold residence of the late Sir Charles Reed, chairman of the London School Board. The property was described as being situate at Page-green, Tottenham, and immediately adjacent to the Seven Sisters and South Tottenham Railway Stations. The mansion itself was stated to be a richly-decorated residence, and there are adjoining cottages and grounds, the whole occupying an area of about four acres. It was added that the property had four frontages, which materially increased its value as a building estate. The biddings commenced with an offer of 4,000*l.*, upon which an advance of 500*l.* was immediately made, and by further advances the property was quickly brought up to 6,500*l.*, when the biddings slackened, on which the auctioneer announced that the property was now altogether in the hands of the company, and would be sold at the price offered if there was no advance, although he considered that 9,000*l.* or 10,000*l.* was a low estimate of its value. By further advances the property was brought up to 7,450*l.*, at which sum it was sold to a syndicate, with the intention of its being laid out as a building estate.

SEWERS AND SEWERAGE.

Burgess Hill (*Sussex*).—The Local Board of Burgess Hill have appointed Messrs. Bailey-Denton & Co., their engineers, to carry out a scheme of sewerage and sewage disposal for their district.

Watford (*Herts*).—The urban authority of the above town have called in Messrs. Bailey-Denton & Co. to modify the present arrangements on their sewage farm by the introduction of intermittent filtration in combination with wide irrigation.

Portland Cement.—Messrs. Matheson & Grant, in their Trade Report, say:—"The factories in the London district, from their local advantages, still govern this trade, and prices have tended to increase slightly with the summer demand. The cost of carriage bears so high a proportion to the price of English cement in foreign countries that attempts to manufacture it abroad are constantly being made. In Russia, whither large quantities are shipped, local factories are being encouraged by a considerable addition to the duty on imported cement. This is likely to limit the export from London to the Baltic and Black Sea, and may tend also to deteriorate the quality of engineering structures in Russia, the evil results from the use of untried cement not being easily detected for some time. The present price for export ranges from 7*s.* 6*d.* to 8*s.* 3*d.* per 400 lb. cask."

THE LATE DEAN OF WESTMINSTER.

QUIETLY, painlessly, almost suddenly, full of labour, if not of years, regretted by troops of friends, one of the foremost men of the England of the nineteenth century has sunk under the great summer heat of July, 1881. Ripe scholar, graceful writer, effective if not altogether ready speaker, courtly gentleman, kind-hearted man, Arthur Penrhyn Stanley, Dean of Westminster, has filled a large space among the notabilities of the day. His memoirs and memorials fill a large space in the journalistic literature of the past week. It is not as such that we have to speak of him, and that not because we could not find much to say, but because space cannot be afforded in our columns for an adequate treatment of any one of the varied phases of an active and honoured life. Still less does it become us to enter into any of those fierce contentions which are not yet extinct as to many of the acts and views of Dean Stanley. There are those among us, as good and as able as he was, who regard many of the chief problems of human life from an altogether opposite stand-point from that taken by him; and whose chief regrets will be that the views which they contest should have been supported by a man adorned by so many noble qualities, or rather, that the golden thread which they hold to run through the whole web of their convictions should not have bound into more perfect symmetry the admitted virtues of the man they so often opposed. With all that we have here nothing to do; nor have we space to speak of a topic more germane to our pages,—the thorough human charity of the man; his love and care for the dwellers in squalor and misery around the Gothic walls of his deanery; his large sympathy with whatever is human. If his remains have not "a tomb of orphans' tears wept on them," yet the memory of himself and of Lady Augusta will long live in something more divine than marble or than brass.

But a word is due from us to the memory, not of the man, but of the Dean. Dr. Stanley's name will be identified with the Abbey not less notably than that of any preceding dean or abbot of Westminster. Haunters from childhood of the sacred precincts, there are those among us who claim an hereditary interest in the Church of St. Peter at Westminster, partly *atavis editi regibus*, as humble members of the "founder's kin," partly as representatives of the artistic hands that have lent some of its chief adornments to the pile. To such, and to all who love and venerate this corner-stone of English history, the memory of Dean Stanley will be dear. What has been done under his presidency for the re-establishment of a solemn and reverent service in the choir is not special to Westminster. St. Paul's owes at least an equal debt of gratitude to its present Dean. Hardly a hamlet so remote but that it feels the influence of the wave of greater earnestness, and therefore deeper reverence, that is flowing over almost every form of religious worship in England.

Our chief concern, however, is with the debt due to the late Dean as the conservator, the historian, and the very voice, of the holiest of our holy places. Under his impulse Westminster first became, since the expulsion of the monks, a place of public worship in the broadest sense of the word,—a place whither the reverent student of sacred antiquity might turn aside from the whirl of City life, and hold commune with the memories of the mighty dead, unvexed by the demand of "twopence for the verger." The care of the monuments, the apposition of printed cards giving the most needed information, the evidence in every corner of the building of the desire that the Minister should tell its own story to every attentive inquirer, will, we hope, not be allowed to sink to rest in the grave of Dean Stanley. And as to the actual material structure, how much of its present order is due to him? Well do we remember being present on the occasion,—and giving some account of it in our columns,—when Dr. Stanley appealed, not in vain, for public support for the restoration of the Chapter-house. The changed state of the whole of that portion of the precincts: Chapter-house, cloisters, chapels formerly hidden; stones on which the inroads of the mouldering teeth of Time have been arrested by the art of the chemist; bit-by-bit repairs of portal and of tracery, on the very lines of the artists of the time of Henry III.,—all these were the work of Dean Stanley. To state what he did for the Abbey and the precincts would be to write a full, and not one of the least important, chapters in the history of the fane in which our monarchs are crowned. It is a chapter which we should gladly see written. In it, if worthily accomplished, will be inscribed, in an architectural sense, the best epitaph of Dean Arthur Stanley.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

2,881. A. H. Elliott, New York, U.S.A. Crushing stone, &c., and making blocks for paving, building, &c., therefrom. July 2, 1881.

2,883. H. P. Dunnill, Ironbridge. Decorating tiles, &c. July 2, 1881.

2,898. F. Grinnell, Providence, U.S.A. Extinguishing fires in buildings. July 2, 1881.

2,904. W. Moore, Lyminge. Composition for polishing articles of furniture, &c. July 4, 1881.

2,920. W. W. Hewitt, Swanscombe. Apparatus for conveying cement, &c., from place to place. July 4, 1881.

2,921. H. J. Haddan, Strand. Roads and pavements. (Com. by J. Salvat, Morceux, France.) July 4, 1881.

2,935. J. Louis, Minories. Supporting, &c., persons outside buildings. July 5, 1881.

2,945. F. D. Harding, Hampstead. Applying decorations to doors, &c. July 5, 1881.

2,969. E. Aldous, Peckham. Ventilating purposes. July 7, 1881.

2,975. E. Johnson, St. Helens. Manufacture of bricks, tiles, &c. July 7, 1881.

2,978. H. J. Haddan, Strand. Chimney caps. (Com. by A. Picherean, Cailly, France. July 7, 1881.)

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

July 5, 1881.

861. W. Morgan-Brown, Southampton-buildings. Hanging doors and blinds. (Com. by E. Prescott, Hampton Falls, U.S.A.) March 1, 1881.

906. G. L. Shorland, Manchester. Stoves and fire-places. March 3, 1881.

1,044. R. Douglass and J. Douglass, Coventry. Apparatus for the cure of smoky chimneys, &c. March 11, 1881.

1,101. M. E. Dearnaly, Mirfield. Bricks, and the method of binding them together in building. March 14, 1881.

1,210. J. Bernard, Great Winchester-street. Baths, &c. March 19, 1881.

July 8, 1881.

934. F. Hyatt, Kensington. Core or skeleton metals, and applying the same to the construction of buildings, &c. March 4, 1881.

1,143. W. R. Comings, Upper Thames-street. Door locks. March 16, 1881.

1,290. W. R. Comings, Upper Thames-street. Bells, knockers, &c. March, 23, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending July 9, 1881.

4,861. C. G. Pfander, Queen Victoria-street. Apparatus for filtering water.

A cylindrical case is formed within which are a number of radial partitions. The compartments thus formed are charged with the filtering material, and the water enters the bottom of the first compartment and rises through it till it flows over the partition into the second, through which it descends, then ascends the third, and descends again through the fourth, and so on, when it is drawn off. Nov. 23, 1880. Price 6d.

4,972. A. C. Engert, Bromley-by-Bow. Fire-grates.

A chamber is formed at the back of the grate, open in front, but closed on all the other sides, in which the fuel is heated before it is drawn forward to be burnt in the grate. The smoke, therefore, from burning the fuel is greatly decreased. Nov. 29, 1880. Price 6d.

4,986. W. Morris, F. P. Preston, J. E. Prestige, and E. J. Preston, Deptford. Apparatus for regulating and controlling the flow of water, &c.

The cistern is fitted with a syphon for flushing purposes, and the long leg of the syphon is connected to a cylinder, fitted with a piston operated by a handle. The inlet from the syphon is at one end, and the outlet to the closet at the other end of the cylinder. By moving the piston, a vacuum is created which immediately fills the syphon and causes a flush. Several different arrangements are shown. Nov. 30, 1880. Price 6d.

4,992. J. Harsant, Vauxhall Bridge-road. Sink trap.

A bell-shaped chamber has a curtain dipping into the water contained therein, and a ventilating pipe is fitted communicating with the space enclosed by the curtain and with the open air. (*Pro. pro.*) Nov. 30, 1880. Price 2d.

4,996. J. Walker, Lower Clapton. Cocks and taps.

Glands are formed at the top and bottom of the cock, and the plug is constructed with three tapers, one in the water-way as usual, another from the water-way towards the top for the gland, and the third from the waterway towards the bottom for the lower gland. Dec. 1, 1880. Price 6d.

5,057. J. F. Hoyne, Water-lane. Apparatus for regulating and controlling the passage of atmospheric air through outlets and inlets.

A tube is filled with coke, asbestos, pumice-stone, &c., through the interstices of which air can freely pass, while at the same time a strong current is broken up. This tube is made to fit the aperture in which it is to be placed. Dec. 4, 1880. Price 2d.

5,102. N. Talard, Paris. Pipe-joints.

Lateral lugs are fixed on one end of the pipes, to which are pivoted links, the free ends of which have eccentrics that can be turned by levers. On the other end of the pipes are jaws corresponding to the lugs. The ends of the pipes being placed together with the lugs opposite the jaws, and the eccentrics being turned, the two ends are brought tightly together. Dec. 7, 1880. Price 6d.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

CHARITABLE AND PAROCHIAL ESTABLISHMENTS.

SIR,—I am sorry to find, by the notice you have done me the honour to give your readers of my work on "Charitable and Parochial Establishments," that I do not appear to have clearly stated what it was in my plans of the St. Marylebone Infirm Wards that received the commendation of Dr. Bridges, the Local Government Board Inspector, and consequently you do him the injustice of supposing that he "has something to learn on the subject of planning and arranging such buildings." Permit me, therefore, to say that no one (not excepting yourself) has more persistently decried than he has, the principle, as a principle, of placing the beds of a ward down the side walls instead of, as usual, against the outer walls. In the case, however, of the St. Marylebone Infirm Wards, to which Dr. Bridges' commendation was confined, the problem to be solved was the erection of a three-storied building, to contain 250 infirm inmates, upon a site 104 ft. by 64 ft., with frontages on two sides only, and if it could have been shown that it was possible under such conditions to have planned these wards so that all the beds should be placed down the outside walls, as is generally the case with all modern hospital wards, then undoubtedly he would have condemned the result of my labours instead of extolling it.

The building in question was erected for the reception of infirm and aged paupers,—a class of persons occupying their wards almost continuously day and night, and the majority of them, though suffering from no acute disease, and able to get up and be dressed during some part at least of the daytime, yet too weakly to often move a great distance from their beds, and consequently it was desirable that each ward should be so planned, as to form a combined sitting and bedroom. The usual mode of planning such wards on a site so contracted as that at St. Marylebone would have been to place the beds in four rows, two being next the outer walls, and two separated by a low partition in the centres of the wards. By this plan it would not have been possible to place the beds at a sufficient distance apart to allow the windows, excepting upon rare occasions, to be open while the inmates were lying in bed; but by the plan adopted by me, the patients can all be lying in bed without any inconvenience arising from the current of air passing through the wards when the opposite windows are open, and thus the maximum amount of cross ventilation is secured. Dr. Bridges, as I understand it, agrees in this view, and so, also, will you, Sir, I venture to hope.

H. SAXON SNELL.

"Evans's."—We are asked to mention that the purchase of Evans's, Covent-garden, by the Falstaff Club is now complete. The premises have been transferred, and the alterations for the purposes of the club are in progress. An old and familiar resort which, in its day, was a very popular place of amusement, has ceased to exist. In the upper part of the house, moreover, the Institute of Architects held its first meetings.

AT A LECTURE BY MR. HELLYER.

At the repetition given of one of the recent lectures on plumbing, the chair was taken by Colonel Thorneycroft, who thus introduced the lecturer:—It may appear strange to you that a chairman should have been brought you so far as I have been, from the Midland counties, but I presume it is because I have given so much attention to this subject and have spent so much money upon it, and it delights me greatly that in London you are becoming aware of the danger of ill-ventilated and badly-drained houses. I made many experiments and spent much money in my own house, and if the National Health Society will accept my remarks and the plans I made of those experiments, I shall be glad to give them, for their republishing, for the benefit of their society. This lecture is on sewage and ventilation, and the Society of Arts have kindly given the use of this splendid room; but what a pity it is that so clever and learned an association should have such a dreadfully ill-ventilated room. It is unfit to lecture in, filled with splendid pictures, but no fresh air; in fact, the air is foul and offensive, because there is no ventilation equal to the wants. There are a few things that it requires: a gas-engine to force in fresh air, and another to suck out the foul air; the gas apparatus at the top does not half do it this hot night. This room reminds me of the besom-maker who turned his donkey out on the common where there was no pasture; and his friends remonstrating with him, he replied, "Well, if there is nothing to eat there is a delightful prospect;" and I say of this room, "If there is no fresh air there are splendid pictures." We want fresh air here for the benefit of listeners. What is the use of splendid pictures if you are panting for fresh air? It is kind of the Society to lend the room, and we are grateful, but they should for their own benefit get it better ventilated, and then more would listen with pleasure and not injure their health. I am delighted that our friends in London are alive to the interest of the subject of this lecture on drainage and ventilation. I have, with the assistance of others at Wolverhampton, started a Sanitary Protection Association, but we get on very slowly. It has been started eight months, and we have got about eighteen customers. These are fully satisfied; but what a struggle to get so few; remember there are 70,000 inhabitants in the town. How long shall we be in getting the town healthy at this rate? Well, I have got some friends to join me in trying to impress on the Government the desirability of having compulsory inspection to all houses, on the same plan as is now adopted with education: all are compelled to comply. Well, health should go with good education, but it wont go without compulsion, so I hope London will join with the country in pressing this point. It can be done at such a trifling cost. You are fortunate in getting such a gentleman as Mr. Hellyer to lecture on this subject, because I believe he understands this subject as well as any man in London, and the more you all know of the subject the safer for you all. Let me, in conclusion, press on you all to have your houses inspected by the sanitary engineer, and after that try them yourself, as the proof of the pudding is in the eating. Open the drain-pipe just a few yards from the house, then let sulphur be burnt in the pipes, and blow the smoke up the pipes with bellows, and if any one smells the sulphur in any part of the house the owner may be sure that he is living in sewer gas, which is deadly and dangerous. I could talk to you for a long time on the subject, it is so important, but I must now content myself by introducing to you the lecturer.

THE NEW ART GALLERY FOR BIRMINGHAM.

THE Mayor of Birmingham (Mr. Richard Chamberlain), on Tuesday last laid the inscription-stone of the new buildings in Congreve-street and Edmund-street, which are to form the Corporation Art Gallery and the offices of the Gas Department. Since the commencement of the alteration in the structure of the Free Libraries and Midland Institute buildings, the town has been without any public art-gallery, the collection of pictures and objects of art formerly contained in the gallery in Ratcliff-place having been temporarily exhibited at Aston Hall, while additions purchased by the Public Picture Gallery Fund trustees have had to be comparatively hidden from general view in the committee rooms at the council house. It will be remembered that last year Messrs. George & Richard Tangye made an offer of 5,000*l.* for the purchase of additional objects of art if the Corporation would at once take measures to provide an art gallery commensurate to the wants of the town, and 5,000*l.* more if a similar sum were raised by public subscription. It was felt that so generous an offer ought not to be disregarded, and while there was every ground to believe that the public would readily second Messrs. Tangye's benefaction by a large subscription, there was a difficulty to overcome in providing from the corporate funds a suitable building, the means of the Free Libraries Committee, limited to a rate of a penny in the pound, being almost wholly required for the libraries alone. A solution, however, was fortunately suggested, which it is hoped will prove satisfactory. The Gas Department, which had hitherto carried on their business at the premises of the Staffordshire Gaslight Company in the Old-square, were in need of better accommodation, and an arrangement was come to whereby the Corporation placed at their disposal the unoccupied land adjoining the Council House upon the condition that the Gas Committee in erecting their offices should reserve the upper story for a Museum and Art Gallery, the expense of this upper story being taken into account in fixing the ground-rent (if any) to be paid by the committee. This arrangement met with approval, and steps were taken to carry it into effect. The Gas Committee were instructed to have plans prepared, and to at once proceed with the construction of the foundations. As the new buildings are to form a continuation of the Council House, the preparation of designs was referred to the architect of that structure, Mr. Yeoville Thomason. The buildings are to cover the site bounded by Congreve-street, Edmund-street, and Eden-place. Upon the ground floor and lower ground floor will be commodious offices for the use of the Gas Department, which will communicate on the ground-floor with the Council House at each end of the structure. The whole of the first floor will be appropriated to the Art Galleries, for which a main entrance will be provided from Edmund-street. There will be six galleries, communicating with each other by archway entrances, the largest gallery measuring 80 ft. by 43 ft. The area of wall space, calculated, to a height of 16 ft. above the floor will amount to 12,298 superficial feet, exclusive of one large gallery, 98 ft. by 53 ft., which is to be set apart for an industrial museum. The external elevation of the building will form generally a continuation of the Council House, the front to Congreve-street being varied by a portico in two stories the full height of the building, and emphasising the entrance to the Art Galleries. The elevation at its junction with Edmund-street will be terminated by a clock-tower. The elevation to Edmund-street will be in harmony with the other elevations of the Council House, but in much plainer style, the principal portion having a receding centre, with projections at each end, finished with curved pediments. The entrances to the gas offices in Edmund-street will be sufficiently marked to produce variety in the design. The elevation to Eden-place will be similar to the present, except that the upper windows are omitted, and moulded panels worked instead. The site was prepared and everything got ready for the stone-laying by Messrs. Barker & Sons, of Handsworth. The clerk of works, Mr. Trevena, and the foreman, Mr. J. Morton. The contract for the erection of the superstructure has not yet been entered into.

UTILISATION OF SAWDUST.

SIR,—Seeing in the *Builder* lately that a suggestion had been carried out for the utilisation of sawdust, I beg to suggest that it should be used to a much greater extent than it is, for the deadening of sound, in the erection of houses, particularly those which are likely to be let off in apartments, and blocks of buildings which are fitted up as dwellings for artisans and others. Considering that about two millions of people in London are living in apartments or dwellings, it is strange that their comfort has not been studied to a greater degree than it has, in prevention of sound by filling up the spaces between the floor-joists with sawdust. It would be well if owners of property knew more of the fearful annoyance which neighbours are to each other, and unavoidably so too, to a great extent, simply through the sounds being heard so distinctly by those underneath them. The children are half-imprisoned, the mothers are harassed beyond measure, and neighbours are at variance, through the noises of each other being heard so distinctly.

C. H. B.

Books.

German, Flemish, and Dutch Painting. By H. J. WILMOT BURTON, M.A., and E. J. POYNTER, R.A. Sampson Low & Co.: London, 1881.

THIS is one of the series of illustrated text-books on art which are being published under the editorship of Mr. Poynter. The title-page, we observe, assigns him joint authorship in the book, but what is his precise share in it there is nothing to show. The name of the other author, who, we suppose, is the actual writer of the greater part of the book, is new to us.

The book appears to us to be one of the best we have seen of the series. It is more satisfactory than the volume on Classic and Italian painting, partly, perhaps, because the subject is more manageable and more easily grasped in a single small volume. The "German School," which is the section of the subject treated first, is traced from its origin, that is to say, there is an opening chapter devoted to "the origin of the German School," but it serves to indicate that the information available upon that part of the history of German art is very restricted. The short chapter on "the precursors of Albert Dürer," however, contains some interesting matter in relation to painters whose very names are hardly known except to professed art students; and the writer does not forget to consider the art in relation to the changes in the times, and to note the spirit of advance, of looking forward rather than back, which the Reformation brought into art as into every other department of human study. Albert Dürer and his followers, including the "little masters" (the Behams and others), are well and rather fully treated of; Holbein and his successors follow, and then the history of the decadence and revival of German art follows. It may be a question whether the latter deserved the name of a revival or not, since it consisted in persistently looking back to the art of a past day and trying to reproduce it. The movement was the counterpart, in fact, of the pre-Raffaellite movement in England, but it did not show the strength and sinew which the painters of that school in England certainly did show, in spite of their perversities of precept and practice. The German pre-Raffaellite movement was more closely connected with a religious movement, ecclesiastical in its tendency, than was the case with us. Art was to be a sort of worship, and worship was to go hand-in-hand with art. When Mendelssohn was in Rome, the younger generation of this school of revivalists were active both in painting and in religious rites, and he describes their devotion to the musical service of the church, which he admired; "one capital fellow of a painter standing next to another, and all shouting like demons," the last phrase referring to their delivery of the Gregorian chants. But all that does not make painting. The German revivalists, says the author, endeavoured to adapt to the mystic style of Fra Angelico, the types of Raffaelle, in which Grecian beauty is visible; and to avoid the fault of which they accused the Dutch School, of not knowing how to idealise the real, they fell into the opposite extreme of being unable to realise the ideal. Certainly no school represented by men who could paint at all could have been more insipid and academically dull than this German revival school, which, indeed, seems hardly worthy of a place in a book dealing with the names and schools which make the essential greatness of German and Dutch art. While noticing the subject, one may be allowed to question whether it is entirely true or just to say that the Dutch painters could not idealise the real. Artistically speaking, there certainly seems to be something like idealisation in the splendid way in which the arrangement of light and composition is often made to give such force and meaning to groups of figures in themselves, no doubt, prosaically realistic.

The history of the Flemish School shows the same kind of influence, and consequent weakening of the art, at a far earlier period, when the Flemish painters began, as has been said, to *Italianise*, and aim at emulating and imitating a school of painting and a class of pictures quite alien from the natural genius of the Flemish mind. The author points out how the portrait painters, such as Antonio More, drawing direct from nature, maintained the superior and robust qualities of Flemish art even when the treatment of ideal subjects had become little more

than an imperfect imitation of Italy. The revival of a genuine Flemish art came with Rubens, to whom naturally a considerable space is devoted, and of whom the author speaks with the degree of enthusiasm which Rubens, as a painter and as a man, does naturally evoke, in spite of all the faults, and in some sense, vulgarities, of his art. These faults the author does not omit to emphasise strongly, but he does full justice at the same time to the greatness of this princely man and powerful painter, who will always be one of the finest and most fascinating figures in artistic biography.

In considering the Dutch School, the author devotes some attention, first, to an earlier and little known Dutch School, the school of the fifteenth century, or commencing in that century, and having little affinity with the brilliant realistic school of the seventeenth century. In commenting on this latter school, we observe that the author does admit the existence of something higher than mere realism in the great Dutch painters, and his remarks on this subject are very good. "We must not suppose that the Dutch School in its realistic character presents nothing but a brutal materialism, and never rises above the delineation of drunken boors at a village inn. There is a *truthfulness* in the Dutch pictures which commands admiration; a dead tree, by Ruisdale, may touch a heart; a bull, by Paulus Potter, may speak eloquently; a kitchen, by Kalf, may contain a poem. All the painters of this school confined themselves to loving, understanding, and representing nature, every one adding his own feelings and tastes,—in fact, adding *himself*. If we visit various parts of Holland in different kinds of weather we shall see how each painter identifies *himself* with the special aspect which he depicts. A barren, gloomy landscape under a leaden sky, unrelieved by living creature, its grim monotony only broken by a waterfall or a dead tree, at once shows in Jacob van Ruisdael the melancholy Jacques of landscape painters, who finds 'tongues in trees, books in the running brooks, sermons in stones.' A bright early morning, when the sun flashes merrily on white sails and glancing streams, and the fat cattle are browsing knee-deep in the rich meadows, reminds us of the lover of light, Aelbert Cuyp. A warm afternoon, when the shadows of the fruit-trees lie across the orchard, and an ox, or horse, or some other animal lies in the grateful shade, tells us of Paulus Potter, the Raffaelle of animal painters, the La Fontaine of artists"; and several other illustrations are given. To some of the painters of interiors the author scarcely seems to do the same justice. He dismisses Ter Borch* (Terburg) very slightly, observing that his *spécialité* was the painting of a white satin dress, by which the chief light in his pictures is formed. But if there is not poetry and imaginative feeling in some of the figures which wear this dress, those qualities can seldom be claimed for any figures in the costume of real life. The illustration of Terburg given on the opposite page, the picture of "The Letter" (in the Hermitage) is, in itself, an example of this. The figure with her back to us is, nevertheless, full of expression and character.

While commending the general tone of the book in its literary style and critical remarks, we may bestow more than commendation on the illustrations. For a five-shilling book they are really marvellous in number and style of execution.

Miscellanea.

Auckland New Cemetery.—At a special meeting of the Auckland Burial Board on the 14th inst., Canon Long presiding, Mr. Pritchett, the architect, attended, when forty-two tenders for the laying-out of the grounds and erecting the necessary buildings for a cemetery were considered. It was, however, decided to call a vestry meeting for the purpose of securing sanction, as required by law, to the proposed expenditure; and the further consideration of the tenders was adjourned till after the vestry meeting.

Mr. Poynter, R.A.—We understand that Mr. Poynter, R.A., has resigned his office of Director for Art and Principal of the National Art Training School at South Kensington.—*Times.*

* A special point is made in the book of giving the correct spelling of all the painters' names, and not the forms into which they have been corrupted.

Metropolitan Provident Medical Association.—On Saturday afternoon, at the invitation of the Duke of Westminster, a meeting was held at Grosvenor House to consider the claims of the Metropolitan Provident Medical Association and its subsidiary financial ally, the Metropolitan Dispensaries Joint-Stock Company (Limited). The object of both is to extend to the working classes, in every part of London and its environs, on terms within their means and consistent with their independence and self-respect, the advantage of medical treatment on the same satisfactory footing on which it is enjoyed by the upper classes, including skilled nursing and a recommendation to a general or special hospital when the case requires it. It had been announced that the duke himself would preside; but at the outset of the proceedings Sir Charles Trevelyan read a letter from his Grace regretting his inability to be present, but expressing his deep sympathy with the movement, in proof of which he said he had subscribed for 500 fully paid-up shares of 1*l.* each in the financial company. In these circumstances Mr. Stansfeld, M.P., the chairman of the Association, presided. Mr. Stansfeld, having briefly defined the object of the meeting, said the conditions on which they were asked to invest in the company afforded a safe guarantee that their money would not be wasted. Proper medical treatment for the working classes was greatly needed, and many had been studying how that want could best be met. He believed that the solution of the problem would be found in provident dispensaries. The present system of gratuitous outdoor medical relief tended to demoralise and to pauperise, and they wanted to cover London with self-supporting dispensaries. The Metropolitan Provident Medical Association would take upon itself the propaganda, and would help the dispensary during its infancy, and until it should become self-supporting and therefore self-governing. The amount of capital which was wanting from the public for the subsidiary limited company was 50,000*l.* Resolutions in favour alike of the association and of its financial auxiliary were carried, after addresses by Sir Rutherford Alcock, Sir Sydney Waterlow, M.P., Mr. Timothy Holmes, F.R.C.S., Mr. W. G. Bann, Sir Charles Trevelyan, and others.

Industrial Schools.—On Monday last an industrial school for girls, on the principle of the industrial schools for boys, was opened at Feltham, Middlesex, under the auspices of the Middlesex magistrates and others. The magistrates of Middlesex since 1854 have passed through the boys' school at Feltham 4,000 of the juvenile offenders, 83 per cent. of whom had turned out well. Encouraged by this success, the magistrates endeavoured to raise by public subscriptions the means of building an industrial school for girls, and funds were subscribed for the purpose of rescuing young girls under fourteen years of age, charged, in many cases, with slight offences, from the disgrace of a prison. The school built for the purpose and ends thus described stands within a mile of Feltham Station, on the South-Western Railway. Mr. E. E. Antrobus, J.P., one of the committee, conducted the visitors over the school, and said it was nearly twenty years since he had first proposed to the Middlesex magistrates that they should apply for an Act of Parliament to enable them to establish industrial schools in the county. The building was judged by the company to be well adapted for its purpose of training girls to an industrial life.

City Churches.—At a meeting of the Council of the City Church and Churchyard Protection Society, Mr. E. B. Ferrey in the chair, the following resolution, proposed by Mr. Henry Wright, honorary secretary, and seconded by Mr. H. C. Richards, was carried *nem. con.*:—"That the Council of the City Church and Churchyard Protection Society regret the recent attack upon the City churches, and the threatened wholesale destruction of so many more, which they, on behalf of their numerous members throughout England, pledge themselves systematically to oppose by every means in their power."

Parish of St. Mary-at-Hill.—The Vestry of this parish have elected Mr. Alexander Peebles, F.R.I.B.A., of Salters' Hall-court, Cannon street, as their surveyor, in succession to the late Mr. John Collier, deceased.

Public Hall, Belper.—The directors have selected the design submitted by Mr. John Johnson, architect, Queen Victoria-street, London.

A New Cemetery for St. George's, Gloucestershire.—On the 12th inst. Mr. S. H. Terry, C.E., Local Government Board Inspector, held an inquiry at the Parochial Offices, St. George's, respecting an application which had been made by the St. George's Local Board to the Local Government Board for their sanction to the borrowing of 5,000*l.* for the purpose of providing a cemetery for the parish. The chairman of the Board (Mr. W. Butler) and several parishioners, were present. The Rev. A. R. D. Flamsteed explained the position in which the parish was placed owing to the want of accommodation for the burial of the dead. The parish churchyard was practically full two years since, and he had consequently written to the Local Board and to the authorities in London desiring that steps should be taken to provide a cemetery. The accommodation in other graveyards in the parish was comparatively *nil*. The surveyor (Mr. W. Dawson) showed the plans he had prepared for the proposed cemetery. The Inspector commented on the clear way in which the surveyor had arranged the grave space; he had not before seen grave spaces so arranged. The paths, which in most cemeteries took up one-sixth of the ground, in Mr. Dawson's plans only occupied one-eighth. He was favourably impressed with the proposed cemetery, and should report in accordance with what he saw and heard.

Hospitals for Paying Patients.—On Monday afternoon the third annual meeting of the Home Hospitals Association for Paying Patients, of which the Duke of Northumberland is president, was held at No. 17, Fitzroy-square, W. In the unavoidable absence of the president, Earl Percy, M.P., was called to the chair. Mr. R. A. Owthwaite, the secretary, read the report, which gave a most favourable account of Fitzroy House, No. 16, in the square, which has been established as a hospital to test the principles of the association, and recommended the purchase of the next house, that in which the meeting was held, which might then be set apart for lady patients, reserving Fitzroy House for gentlemen. The report was adopted on the motion of the chairman, seconded by Sir Rutherford Alcock, K.C.B. Dr. Quain proposed "That it is desirable to raise 5,000*l.*, with the object of purchasing the freehold of No. 17, Fitzroy-square, and for finding funds for the necessary fittings and furniture, for providing additional accommodation of a similar kind to that already afforded at Fitzroy House." This was seconded by the treasurer, Mr. Frederick Cox, and carried unanimously.

Fire at Messrs. Doulton's.—On Sunday morning, shortly after eight o'clock, a destructive fire broke out in High-street, Lambeth, upon the extensive premises of Messrs. Doulton & Co., potters, &c. The fire commenced in a large building of recent erection, four floors in height, about 80 ft. by 60 ft. in dimensions, and as an instance of its rapid spread it may be stated that the roof fell in within some twenty minutes of the first arrival of the engines. When the firemen ceased playing upon the premises, the building in which the fire had originated was completely burnt out and the roof destroyed, while an adjoining building of three floors, about 200 ft. by 70 ft., used as moulding-rooms, had, with its contents, been seriously damaged by fire, heat, and water. The cause of the fire is officially returned as "unknown," but it is believed that it was the overheating of a kiln. Messrs. Doulton are insured in the Queen and the Scottish Union offices.

Bursting of a Water-main.—About nine o'clock on Monday morning the Grand Junction Waterworks Company's trunk-main burst in Goldhawk-road, Shepherd's-bush. The pipe is 30 in. in diameter, and as it was connected with a very large head of water, a serious flood was occasioned. The pressure burst up a large portion of the road, but fortunately little or no damage was done to private property. The chairman of the company asks us to state that every effort is being made to restore the water-supply to the town district.

New Shop door Latch.—Messrs. Sabatier & Co., whose special business appears to be to supply ironmongers with all kinds of French hardware, have lately introduced a new latch adapted for doors which are opened hundreds of times in a day. The main part is a coil spring of a steady action, while the lever handles allow a gentle pressure, though the spring is very strong, and is easily removed to allow the shutter to be fixed when closing. This latch being nickle-plated has a good appearance.

The Brighton Parade Fence.—The Marine-parade at Brighton has received an addition which is both useful and ornamental, in the shape of a fence. It commences at the aquarium and terminates at the junction of the Madeira-road with the Marine-parade, not far from the eastern boundary of the town. The straight portion, which is fixed at the edge of the cliff, is 5,400 ft. long, and consists of massive iron standards placed 8 ft. centre to centre, each weighing 3¼ cwt., between which are bolted panels weighing 4¼ cwt., and a top rail of teak 4 in. in diameter is fixed above, forming a comfortable rest for visitors to lean upon. At intervals there are ten balconies which form recesses for seats, from which an uninterruped view of the sea, beach, and Madeira-road below can be obtained. There are also four flights of stone steps nearly 50 ft. high, down which similar iron fencing has been fixed, and this, added to the straight part, gives a total length of 6,160 ft. of ironwork. The standards are placed on a bed of Portland cement concrete, and a wall of the same material is formed round and between them forming a facia and coping 2 ft. 6 in. on the front. Altogether there are about 350 tons of iron and 750 cube yards of concrete. The stone steps and footpath have also been relaid throughout. The fence was designed by Mr. P. C. Lockwood, the borough surveyor, and the works have been set-out and superintended by Mr. W. Parsey. Messrs. C. Reed & Son, of Brighton, supplied and fixed the ironwork, and Mr. J. G. B. Marshall was contractor for the concrete and other work. The fence has been carefully ranged to straight and curved lines on the top of the old wall which is not quite regular on plan, and the gradients of the fence have been arranged to give as nearly as possible a uniform fall for the water to the kerb.—*Iron.*

The Social Education of Wo kmen—The fourth annual meeting of the Workmen's Social Education League was held last Saturday in the hall of the Society of Arts, under the presidency of the Earl of Dalhousie. From the annual report it appeared that the league had made satisfactory progress during the last year. Since the last annual meeting 201 lectures had been delivered. The committee had reason to believe that the lectures which had been given had led to a considerable amount of individual reading and study on the part of those who had attended them. The balance-sheet showed that whatever success had been achieved had been attained at a trifling cost, in consequence of almost all the work having been done gratuitously. The chairman, in moving the adoption of the report, said the society had been about three years in existence, and it was only last year that it had suddenly struck into something like prominence. Its object was to organise lectures and discussions, especially in working men's clubs and working men's institutes on such matters as history, social and political science, economical science, &c., in order to lay the groundwork in men's minds for the formation of mature and solid opinion upon political questions. The report was adopted. Among the resolutions was one for the changing of the name of the society to "Social and Political Education League."

Royal Architectural Museum.—We have received a letter from the chief officers of this institution, now hidden away in Tufton-street, Westminster, appealing to the public for assistance. An ill-contrived building on an ill-selected site have been the almost fatal obstacles to its progress against which it has had to fight. The writers say:—

"The museum has, in addition to its other objects, a sketching-club, which is much used. Unhappily, however, at a time when the museum has won for itself a solid and grateful recognition by workmen such as it has never before been able to claim, it finds its usefulness much crippled owing to the death of many of its old subscribers, and the difficulty experienced in securing the sympathy of fresh friends to whom its early struggles are naturally unknown. The amount required, in addition to its present income, to keep the museum afloat is about 200*l.* a year, and for this sum its managers earnestly plead. Donations and subscriptions will be received by Mr. R. Druce at the Museum, or by our bankers, Messrs. Cocks, Biddulph, & Co."

Land in Yorkshire.—At the Mart, on Wednesday in last week, Messrs. Edwin Fox & Bousfield sold the Finningley Estate, Yorkshire, consisting of 2,418 acres, which, with the buildings and cottages, thereon, produces a rental of 2,200*l.* The first offer for the property was 40,000*l.*, and the biddings advanced to 60,000*l.*, at which amount it was sold.

Gas Explosion at Camden Town.—A singular explosion, which might have been attended with very serious consequences, occurred early on Wednesday morning in the Chalk-farm-road, Camden-town. The road crosses the Regent's Canal by an iron girder bridge, erected four years ago. The roadway is divided from the foot pavements by hollow girders made of heavy iron plates, with cappings and other ornaments. The gas company, instead of running their main along the bridge in the ordinary way, have, it is stated, made use of one of these hollow girders as a pipe or tube for connecting their main. About half-past five o'clock on Wednesday morning a lamplighter, who was cleaning a lamp close by, noticing a strong smell of gas, approached the girder with a light. A violent explosion followed, splitting the girder, throwing the man into the roadway, and doing considerable damage to the bridge. One portion of the girder, weighing about 8 cwt., was blown a distance of 16 ft. The lamplighter was fortunately uninjured. Mr. Booth, the surveyor of the district, was soon on the spot with some of his men. He did not find it necessary to stop the traffic. Later in the day Mr. Booth Scott, the chief surveyor, accompanied by several members of the Committee of Works and the manager and district superintendent of the gas company, made a minute examination. It is supposed that the ironwork having expanded from the heat of the weather, air had made its way into the hollow cappings and so become mixed with the gas. Had the explosion occurred half an hour later, large numbers of men would probably have been crossing the bridge on their way to work.

The Westmorland Sea-Green Slate is now protected by a registered trade-mark, which may be seen by referring to our advertising columns. We find, by a reference-list sent to us, that these slates are largely used for the best buildings in the British Isles, and are evidently in favour with the leading Gothic architects of the day. Amongst the buildings covered with these slates we notice St. Thomas's Hospital and a long list of other important structures.

Bow-street Police Courts.—Complaints reach us of the bad acoustic qualities of the new Police Court in Bow-street.

TENDERS

For buildings for the Moseley and Balsall Heath Institute, Birmingham. Mr. W. Hale, architect. Quantities supplied:—

S. Taylor	£4,100	0	0
T. Smith	4,000	0	0
W. H. Parton	3,933	0	0
J. Moffat	3,743	0	0
W. Matthews	3,726	0	0
J. Barnsley & Sons	3,678	0	0
W. Brooks	3,665	0	0
B. N. Smith	3,543	0	0
J. Bowen	3,494	0	0

For finishing three detached dwelling-houses at Wallington, Surrey, for Messrs. Parkers. Mr. A. Bradley Rooke, architect. No quantities:—

Rose	£1,795	0	0
Hazel	1,610	0	0
Young & Co.	1,470	0	0
Uff	1,416	0	0
Knight	1,286	5	0
J. O. Richardson	1,207	0	0
Baxter	1,130	0	0

For alterations, &c., to the Green Dragon, Poplar, for Mr. Davis. Mr. W. E. Williams, architect:—

Wood & Sleep	£478	0	0
Eaton	464	0	0
Marr	441	0	0

For rebuilding the Roebuck, Enfield Highway, for Messrs. J. Carter, Wood, & Co. Quantities by Mr. E. Crutchloe:—

Curtis	£2,410	0	0
Field & Sons	2,286	0	0
Toms	2,126	0	0
Boyce (accepted)	1,970	0	0
Tyers	1,260	0	0

For alterations and decorations to 17, Kensington Garden-terrace, for Mr. A. Stuart:—

John Vears & Co. (accepted)	£750	0	0

For alterations and additions to 48, Baker-street, for Mr. W. J. Jameson:—

John Vears & Co. (accepted)	£391	0	0

For warming and ventilating the new schools, Stockton-road, Sunderland, with new hydro-caloric apparatus. Mr. J. P. Pritchett, architect:—

J. Weeks & Co. Chelsea (accepted)	£2 3	17	6

For manager's house and boundary-walls for Sevenoaks Gas Company. Mr. A. Penny, architect:—

Duntnall, Brasted	£1,039	0	0
Haisman, Foots Cray	1,007	0	0
Wiltshire, Sevenoaks (accepted)	1,005	0	0

For building a stable in the Station-road, Forest Gate, for Mr. G. Roberts. Mr. E. Brown, architect:—
Dyer & Son (accepted).

For the erection of a villa in Haling Park, Croydon, Mr. D. R. Dale, architect:—
For concrete basement:—
Hoare & Son, Blackfriars-road (accepted).
For the superstructure:—

W. Marriage, Croydon	£4,204	0	0
T. W. Smith & Son, Essex-road, Islington	4,190	0	0
Maides & Harper, Croydon	4,170	0	0
Barton, Walthamstow	4,146	0	0
Faukner, Old Kent-road	4,123	0	0
Hoare & Sons, Blackfriars-road	3,987	0	0

For the erection of a new folding-room at the Steyne Mills Laundry, Acton, for Messrs. Rush & Co. Mr. E. Monson, jun., architect. Quantities supplied:—

E. Eydmann, Acton	£387	0	0
C. Maton, Kew	347	0	0
J. Dorey, Brentford	338	0	0
T. Nye, Ealing (accepted)	319	5	0

For erection of a house and laundry in Strafford-road, Acton, for Mr. T. J. Howell. Mr. E. Monson, jun., architect:—

T. W. Whiteman, Acton (accepted)	£800	0	0

For the erection of a new wing to the Infirmary for the Guardians, Brentford Union, Isleworth. Mr. E. Monson, jun., architect. Quantities by Mr. F. T. W. Miller:—

C. W. Reading, Belgravia	£4,089	0	0
Shuff & Co., Acton	4,089	0	0
Stevens & Bastow, Bristol	3,859	0	0
Nightingale, Lambeth	3,797	0	0
Vernon & Ewens, Westminster	3,790	0	0
H. Haynes, Alperton	3,750	0	0
T. Taylor, Uxbridge	3,700	0	0
G. Gibson, Southall	3,489	0	0
Jones & Co., Gloucester	3,450	0	0
T. Brunsden, Brentford	3,425	0	0
T. Hiscock, Hounslow	3,399	0	0
J. Beauchamp, Brentford	6,375	0	0
C. Maton, Kew	3,350	0	0
C. Claridge, Banbury	3,320	0	0
J. Dorey, Brentford (accepted)	3,099	0	0

For the erection of three shops on the Ravensworth House Estate, Fulham-road, Walham-green. Mr. E. Monson, jun., architect:—

G. Lyford, Hammersmith (accepted)	£2,000	0	0

For building three shops in the Broadway, London Fields, for Mr. J. Elves. Mr. E. Brown, architect:—

C. Marr	£2,673	0	0
T. Nixon	2,647	0	0
F. & F. J. Wood	2,567	0	0
J. Uff	2,456	0	0
J. H. Johnson	2,353	0	0
W. Shurmur	2,327	0	0
S. Salt	2,255	0	0
Hawkings	2,100	0	0

For the erection of manager's house and boundary-walls at the Gas Works, Sevenoaks, for the Sevenoaks Gas Company. Mr. A. Penny, architect:—

Duntnall	£1,039	0	0
Haseman	1,007	0	0
Wiltshire (accepted)	1,005	0	0

For painting, &c., to the United Westminster Schools, for the Governors. Mr. R. R. Arniz, architect:—

Clemence	£486	0	0
Smith & Co.	462	0	0
McLachlan & Sons	398	10	0
King & Son	398	0	0
Adamson & Sons	376	0	0
Smith	350	0	0
Wilkes	270	0	0

For repairs and decorations to 97, Westbourne-terrace, for Mr. M. Jaffé. Messrs. Joseph & Pearson, architects:—

McLachlan & Sons (accepted)	£640	0	0

For the erection of mineral water premises, for Mr. E. Bonser, Nottingham. Mr. F. Jackson, architect:—

Bell & Son	£1,176	10	0
Marriott & Wartnaby	1,157	10	0
E. Hind	1,119	0	0
R. Middleton	1,050	0	0
Smith & Attewell	1,029	18	10
Huskinson & Jefferys (accepted)	1,014	0	0

For the raising of master's house of All Saints' Schools, Nottingham. Mr. F. Jackson, architect:—

Bell & Son	£163	0	0
Smith & Attewell	160	10	0
R. Middleton	150	0	0
Huskinson & Jefferys	145	14	0
Marriott & Wartnaby (accepted)	135	0	0

For raising roof and erecting new floor, in building at west side of Imperial Colour Works, Bow, for Messrs. J. W. & T. A. Smith. Mr. A. Ashbridge, architect:—

Palmer	£120	0	0
Calnan & Co.	105	0	0
Goodman*	95	0	0

* This tender did not include surveyor's fees.

For repairs to roofs, &c., at the Vine-street Casual Wards, for the Guardians of the Poor of the Holborn Union. Messrs. H. Saxon Snell & Son, architects:—

Howard	£238	0	0
Bamford	221	0	0
Morris	200	0	0
Patten (accepted)	182	0	0

For repairs to houses in Luscombe-street, Wandsworth-road, for Mr. F. J. Purssord. Mr. R. Cruwys, architect:—

Smart, Brixton	£180	0	0
Stevens, Wandsworth	120	0	0
Farquharson, Wandsworth (accepted).			

For rebuilding Wisbey Wharf, Bow-common, after fire, for H. W. Walden:—
Parrish (accepted)

For alterations and additions to the Prince of Wales public-house, Deptford, for Mr. E. Behrens:—
Parrish (accepted)

For Board schools at Orpington, Kent. Mr. J. Ladds, architect:—

Watson & Dennett	£2,487 15 0
Taylor & Son	2,269 0 0
J. E. Julian & Co.	2,226 0 0
Gallard	2,221 0 0
Morris	2,220 0 0
Payne	2,205 0 0
Haisman	2,200 0 0
Wright	2,193 0 0
Eldridge & Gee	2,188 0 0
Elwig	2,133 0 0
Bingham	2,126 0 0
Marsland	2,110 0 0
Willicomb & Oakley	2,100 0 0
Jones & Co.	2,062 0 0
Higgs	2,049 0 0
Beale & Son	2,030 4 9
Warr	2,022 15 0
Waite (accepted)	1,846 5 0

For alterations and additions to the Downs, Tawcie Park, Sydenham. Messrs. Edwin & W. Hilton Nashe architects:—

Greenwood	£1,693 0 0
J. & C. Bowyer	1,680 0 0
S. J. Jerrard	1,609 0 0
O. Jarrett	1,494 0 0
C. Coles (accepted)	1,479 0 0

For a pair of houses, coal-store, and stabling for Mr. H. Moore, at Ryde, Isle of Wight. Mr. R. J. Cornewall Jones, architect. Quantities supplied:—

Stevens & Sons, Southampton	£2,246 0 0
Jenkins, Bros., Ryde	2,135 0 0
Light & Co., Portsmouth	2,102 0 0
Barton, Ryde	2,070 0 0
Berwaker, Southsea	2,050 0 0
Jolliffe, Sandown	1,980 0 0
Sibley, Ryde	1,758 5 0
Saunders, Ryde	1,745 0 0
Meader, Ryde	1,650 0 0
Salter, Ryde	1,550 0 0
Hutchings, Binstead	1,511 0 0

For the Pinner sewerage and outfall works:—

H. Haynes, Alperton, Harrow	£11,450 0 0
F. Larter, Harrow Weald	11,070 0 0
W. Botterill, Cannon-street	10,551 0 0
J. Cardus, Acton	9,900 0 0
G. Stevenson, Ecklington, Derbyshire	9,810 0 0
C. Killingback, Camden Town	9,750 0 0
J. Jackson, Upton, Essex	9,740 0 0
Bottoms, Bros., Battersea	9,104 0 0
J. Neave, Lewisham	8,940 0 0
Nowell & Robson, Kensington	8,880 0 0
B. Nicholson, Chelmsford	8,839 3 4
Ford & Co. Great Queen-street	8,200 0 0
J. Kindell, Harrow	7,920 0 0
W. Coker, Great Hadham	7,591 13 0
G. G. Rayner, Boolle, Liverpool	7,340 0 0

For alterations and additions to the London and South Western Bank, Camden Town Branch, 68 and 69, Parkstreet. Messrs. J. & J. S. Edmeston, architects:—

	If wholly in Stone.	If in Cement.
Higgs & Hill	£4,430	£4,230
R. White	4,248	3,949
Gould & Brand	4,157	3,947
Clarke & Bracey	4,180	3,720
T. Nye	4,058	3,819
J. Smith & Son	4,037	3 696
Boyce	3,989	3,789
W. Smith & Son	3,889	3,610
Lucas & Son	3,141	3,110

For the erection of a cottage in Croft-road, Carshalton, Surrey, for Mr. P. C. H. Jay. Messrs. Ebbetts & Cobb, architects. Quantities supplied:—

Clarke & Bracey	£587 0 0
Langley & Pinkham	568 8 0
Humphries	529 0 0
J. O. Richardson	529 0 0
Stewart	528 0 0
Ward	510 0 0
Evans	498 0 0
Holt	466 13 3

For Cardiff Church. Mr. H. T. Northcroft, architect. Quantities supplied:—

Wall & Hook, Brimscombe	£10,500 0 0
Estcourt, Gloucester	8,989 0 0
Stephens & Bastow, Bristol	8,649 0 0
Shepton, Cardiff	8,340 0 0

For cottages at Hutton Cranswick, for Mr. Dosser. Mr. W. Hawe, architect:—

T. T. Dickinson, Driffield	£436 0 0
M. Gage, Driffield	430 0 0
G. & R. Pape, Beverley	425 0 0
John Barnes, Beverley	390 0 0

For farm buildings at Hayes Gate Farm, Hayes, Middlesex, for Mr. H. P. Cotton:—

Hunt	£850 0 0
A. & B. Hanson	837 0 0
Postlethwaite	726 0 0
Pocock	822 0 0
Kearley	649 0 0

For building new wing and alterations to 106, Westbourne-terrace, for Mr. A. L. Cohen. Messrs. Joseph & Pearson architects:—

M'Lachlan & Sons (accepted)	£1,598

For alterations and additions for Messrs. Grant & Grant, Forest Hill. Mr. Goodsack, architect. Quantities supplied:—

Heath	£1,910 0 0
Marriage	1,899 0 0
Masters	1,785 0 0
Potterton	1,697 0 0
Taylor & Parfitt	1,690 0 0

For alterations to business premises at Leytonstone, for Messrs. F. Dutch & Co. Mr. D. R. Dale, architect:—

Farr & Co.	£437 0 0
Hoare & Sons	425 0 0
Arber (accepted)	360 0 0
Barton	351 0 0

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The Builder.

VOL. XLI. No 2093. SATURDAY, JULY 30, 1881.

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Water Famine in London.

THE idea of a water famine, with the thermometer approaching 100° Fahr., is not an agreeable one. But during the past few days more than one part of London has had a very broad hint that such a calamity is not impossible. On the 19th of July, in his place in the House of Commons, Mr. W. H. Smith asked the President of the Local Government Board whether he was aware that in those districts of London supplied by the Grand Junction Company there had been an almost total suspension of water supply, and whether the Local Government Board were prepared to exercise the authority they possess in order to make the Grand Junction Company comply with their statutory obligations.

Mr. Dodson had experienced,—we may be pardoned for saying it is satisfactory to hear,—the most direct appeal on this subject, from the fact of a deficient supply in his own house. He had also received notice of the failure of a high-service supply at Brixton, as to which inquiries had been set on foot. The right hon. gentleman also referred to past efforts to bring in a Bill on the subject of the water supply, which the Government had not considered it expedient to re-introduce during the present session. Thus the fact of failure is undisputed. The bursting of a main is said to have been one cause, but it is pretty evident that the mechanical resources of the company are not adequate to bear the stress of the unusual demand for water due to the heat of the month. Looking back to past years, we can say that the extra demand must have have amounted to at least 20 per cent, and very probably to more. Failure under such circumstances is not absolutely inexcusable, as far as any particular main is concerned, but what *is* inexcusable is the want of any alternative or supplemental system, by means of which the supply of so prime a necessary of life should be kept up pending the repairs of any fractured pipe or pump. Provision of this kind the customers of the water companies have the right to demand.

The Grand Junction Water Company supplies an area of 5½ square miles, extending in a very irregular form from Charing Cross to beyond East Acton and Wormwood Scrubbs. Its expended capital, in 1878, was 1,170,125*l.* The character of the district that it supplies, or the costly nature of its works, is indicated by the fact that while the average expenditure of capital by the eight water companies of London is at the rate of 21·8*l.* per house, or 3·05*l.* per unit of population, the Grand Junction has laid out 31·5*l.* per house, or 3·45*l.* per head of its customers. The daily supply furnished by this company is a little above the average of 32·25 gallons per head, being (for the year of which we have the details analysed) 33·6 gallons per head per diem, or 57·7 tons of water per soul per annum. The working expenses of this company, however, are unusually heavy, amounting to 6*s.* 8*d.* per 100 tons of water, while the average cost of the eight companies, including the Grand Junction, is 4*s.* 8*d.* per 100 tons. The main element in this extra cost is the pumping, which cost 3*s.* 9½*d.* out of the above-mentioned 6*s.* 8*d.*, the average cost of pumping for the whole of London being 1*s.* 4½*d.* per 100 tons of water delivered. Nor is it difficult to point out the cause at once of the cost of pumping, and of the extra stress that is evidently thrown upon the machinery and connexions of the Grand Junction Company. Taking its supply from the Thames at Hampton, the company serve a district of which many portions lie above the 85 *ft.* contour line, and of which the highest point is 113 *ft.* above Trinity high-water mark. To this height has to be added the height of the houses, say 40 *ft.* Thus, subject to any relief from districting and subsidiary lifts,—if such there be,—there is a pressure of 158 ft. of head, or nearly five atmospheres, on the mains and connexions of this company, and an amount of dead weight is lifted by the pumps which, measured by the tolerably safe rule of actual cost, is more than two and a half times as much, per ton of water distributed, as that which is raised by the Kent Company from their deep wells. It is thus easy to see a physical reason for the fact that it is the Grand Junction Company which is the first to suffer under the extra stress of an increased summer consumption of water.

Not that the Grand Junction Company is by any means alone in its trouble. The Southwark and Vauxhall has received the same equivocal compliment of Parliamentary notice. By that safety-valve, public indignation is allowed to exhale, at extremely small inconvenience to the companies of which complaint is made. One thing, we apprehend, it has been within the power of the local authorities to control. We have little doubt that much of the want of water, where its absence is most dangerous, that is to say, in the interior sanitary arrangements of the dwelling-house, has been due to the over-watering of the streets. In many cases this has resulted in the production of a thick mud, the steam from which, with the thermometer at 95° and above, has been anything rather than conducive to the comfort or health of the inhabitants of London.

We wish to take the occasion of a pinch which has been so sensibly felt by so many of the inhabitants of London, to renew our often-repeated warning that the water-supply of London is a subject that ought to be regulated on the principles of hydraulics and of sanitary engineering, rather than made a stalking-horse for the speculator, whether financial or political. More particularly have we felt it to be a duty to do this since the curious oversight made by the Registrar-General in 1876, when that officer ventured to assert that the Metropolitan Board, by borrowing 20,000,000*l.*, at 4 per cent., could supply the ratepayers with gas and water at half the present cost. The learned statistician would have been, no doubt, not far from the mark but for his unfortunate assumption that stock paying 8 and 10 per cent. could be purchased by the authorities at the par price of a 3½ per cent. stock. This tremendous oversight having once been made, a perfect harpy flock of speculators endeavoured to swoop upon the prey. We have been, we believe, alone or nearly so in the press, in pointing out on the one hand the inadequacy of the estimate above cited; then the inadequacy of that brought forward by Mr. Chadwick in the rooms of the Society of Arts (on the occasion of the water conference), which proposed to purchase, not gas and water companies for twenty millions, but water companies alone for twenty-six millions. Again were we alone in warning the public, in the opposite direction, against the calculations by which the late Mr. E. J. Smith misled the late Government into the most unfortunate proposal of a plan which would have burdened London with no less a sum than 38,000,000*l.*,* for merely obtaining the property and control of the water-works. Thus between March, 1876, and March, 1880, we have had to maintain (and to prove by details) first, that it was absurd to talk of purchasing the water companies' property for ten millions, or even for twenty-six millions, of money; secondly, that it was absurd (and worse than absurd) to offer them thirty-eight millions for the same property, *plus* the moderate growth in the four years intervening. These are points which ought never to be forgotten when water supply reform is on the *tapis*.

How is it, it may be asked, that the *Builder* has taken a steady middle-course during the four years in which the pendulum has swung so tremendously from side to side as from a 10-million to a 38-million valuation by Government officials?

For this reason, we venture to reply: We have regarded an hydraulic problem as affected by hydraulic considerations, and a sanitary problem as affected by sanitary considerations; and we have given unwearied time and pains, first, to ascertain, and then to co-ordinate, the actual *data* of the case. And by this method (whatever be the success of any particular attempt to use it), and by this method alone, we hold that the problem can be solved.

On the contrary, the first idea of the Registrar-General was to effect a large economy by

* See *Builder*, vol. xxxviii., p. 302.

putting the control of the water-works in the hands of the Metropolitan Board of Works,—an economy which that officer was so anxious to effect that he entirely overlooked the most obviously controlling *data*. The object of the second attempt (we have by us all the papers, printed but not published, for reasons at which we have before hinted) was to enrich private speculators at the expense of the water companies. The object of the third effort was to introduce a grand scheme of Government, or at least of administrative, control. In neither of these cases did the persons who came before the public begin at the beginning, or regard the hydraulic problem as an hydraulic problem. It is so much easier to make assumptions than to analyse facts! That a central Board would do things so much cheaper was the assumption; why this should be so no one attempted to show.

If any good is to be done in the way of improving the water-supply of London, we venture to assert it will only be done by modestly beginning at the beginning. We have to ascertain, first, the requirements of the case; secondly, the mode in which these requirements are now met; thirdly, the mode in which these requirements are to be better met; and fourthly, the equitable and determinate cost of such changes. We are not now about to enter further into this great and important question than we feel compelled to do by the partial breakdown of the last week.

The main reason for a central authority or unity of control in the London water-works, as far as economy of working is concerned, is the saving that can be effected by districting, that is to say, by supplying water according to zones of level. These zones exist on the ground, irregularly, it is true, but in a manner which may be compared to the successive coats of an onion. The territories of the companies, on the other hand, are distributed more like the cloves of an orange. Thus the Thames water is forced up 158 ft. and more by the Grand Junction Company, while the reservoirs of the New River Company at Stoke Newington are 87 ft. above Trinity high-water mark. To supply the higher portions of the Grand Junction district from the New River reservoirs would thus save half the cost of pumping, or 3*s.* 4*d.* per 100 tons of water. This is not a vague estimate, such as those brought forward in support of Sir R. Cross's Bill as to the economy of "concentration," but a simple, definite, certain, engineer's calculation. We are not in a position to state whether this saving might be effected over the entire district served by the Grand Junction Company, because we are not aware of the arrangements of that company for subsidiary lifts, if any. If we suppose the water to be forced by one set of pumps into the entire closed system of pipes, it is certain that the five atmospheres' resistance must act on the entire quantity. In that case an unnecessary expense of more than 15,000*l.* per annum is incurred in the 65,000*l.* of working cost of this company alone. That, as we admit, may be an excessive view of the case; but that whatever portion of the district of this company lies at an elevation of more than 87 ft. above the Thames, might economise that proportionate amount of pumping, if served from reservoirs which the water enters by gravity at that level, is incontestable.

Here, then, in the lesson of this dry and hot July of 1881, we may read a very forcible illustration of the principles advocated in our pages. Engineering questions must first be approached on engineering principles, not on those of the amateur, the speculator, or the politician. When the intelligence of London has grasped this truth, water reform will follow.

Clever Young Man!—A correspondent writes:—A prize being offered for the best plan for a new chapel-of-ease for Bowness and Windermere, about fifty plans were sent in from various parts of the country, and by many well-known and eminent architects. On Saturday, the 25th ult., the committee for examining and choosing the plans met, and a design was fixed upon, the motto of which was "Truth." After passing the usual form of approval and election, the name of the successful architect, wonderful to relate, was found to be Mr. Joseph Pattinson, the fourth son of Mr. Thomas Pattinson, of Bowness, now in the employ of Mr. Ferguson, of Carlisle. These things will happen in the best-arranged competitions.

MONTFAUCON.

We spoke recently of an English translation of Winckelmann's famous "History of Ancient Art,"—the work of an American student,—which has lately made its appearance in England. If to the great German antiquary modern archæology owes its debt of gratitude for the new direction given by his famous book to the study of Classic art, some recognition at least is due to a predecessor of Winckelmann in his labours,—Montfaucon. Montfaucon's name may be almost linked with that of Winckelmann in the reputation it enjoys with the reading public; both are eminently respectable and respected authorities, from whose works and efforts, however, the present generation feels it has little to learn,—they are fortunate, indeed, in comparison with many other studious antiquaries of the past whose names can alone be found in the biographical dictionaries, and whose works remain in their dusty resting-places on the long undisturbed upper shelves of old libraries. But we owe to these seekers into the past our gratitude; indeed, to many we owe the commencements of the noble collections that now rank among the most valued possessions of the nation; we owe to them the fostering, in ages too often given over to frivolity, of the spirit which has led in our day to such remarkable results, and in the case of our local antiquaries we should ever be grateful to them for the gathering and garnering of stores of information we should now find it impossible to acquire for ourselves.

A hundred and sixty-two years separate us from the publication of Montfaucon's first great antiquarian work, "Antiquité Expliquée," with its mass of information on the details of Classic existence. Montfaucon, indeed, may be said to be the first modern writer to have approached this prolific field of research, but with what imperfect tools we can at this date imagine. Sturdily, however, he buckled himself to the task, and, aided by an enthusiasm that was eminently calculated to overcome all obstacles, he laboured, toiled, and cleared the field, the crop from which we now all have it in our power to reap. It was not a mere essay that the learned Benedictine monk attempted; the folio volumes he produced, with their numerous plates, embrace in a very comprehensive manner, even for the present day, the mythology and life of antiquity. We must thank Montfaucon for having first searched the classic authors with a view to elucidating this study. The philosophy of the ancients, or, as our great Bacon calls it, "the wisdom of the ancients," had, till Montfaucon's time, formed the interest of antiquity; since Winckelmann's time, for on him we must look as the founder of the critical study of Classic art, archæology has taken its rank among the subjects of inquiry for Classic students, archæology proper the study of the beginnings of art. But Winckelmann in Montfaucon had a predecessor, who, if he did not approach the subject in the same spirit or with the same aims, at least may be granted the merit of having passed over the same ground; and when we take into consideration the epoch in which he lived, we cannot but be surprised at the result of his efforts, efforts made while the science of which he was so devoted a student was but in its infancy, and supplied with but the most elementary materials. None who may be led to turn over the folio volumes which the industrious Benedictine monk produced, and the numerous illustrations which accompany the text, can fail to be struck by the erudition and research of the author. If of the illustrations it may be said that their quality scarcely bears a relation to their quantity, their merit and accuracy have alone been surpassed since the aid of photography has placed it within our power to produce trustworthy representations of the works of the past. It is scarcely yet in England that we can afford to cavil at the want of careful observation in the illustration of Montfaucon's works. As for their value for reference purposes it remains of course, unchanged.

Montfaucon's "Antiquité Expliquée," translated shortly after its appearance into excellent English, by Humphreys, and published by old Tonson,* has, of course, long since been set aside by later works. We have it, however, on the authority of so distinguished a bibliographical student as Brunet, that it has never been superseded, though the information he gathered has largely served to aid the researches of his successors; indeed, when a work embraces, as does his, a consideration of the whole of Classic mythology treated in detail, with its figured representation, the religion of Egypt, Greece, and Rome, and many other of the nations of antiquity; the costume of the ancients, the plan of their houses, the figured reproductions and description of their various utensils, vases, measures; their public baths, their theatres, and games; their customs and rites, marriage ceremonies, punishments, &c.,—their arts, and the various instruments of their trades and professions;* the whole military system of the Greeks and Romans, their campaign operations, their bridges, aqueducts, navigation, shipbuilding, seaports, &c.,—it can be understood that such a work exhausted all the contemporary existing sources of information. Need we be surprised to learn that, on the appearance of the book "everybody was desirous to read it, —even the ignorant." In two months' time the edition of 1,800 copies was exhausted.†

The production of one such work might appear to afford an adequate effort for the life of any man, but the methodical course of study of Montfaucon enabled him to produce many other works. In the Classic authors he was, as might be supposed, deeply versed; with the bewildering commentary-riddled writings of the early Church Fathers and their complicated theology, he was no less familiar, and numerous are the works which the Catholic Church owed to the industrious Montfaucon. He found time to visit Italy very thoroughly in search of manuscripts, and the summary of his happy wanderings through the then undisturbed convent libraries of the Peninsula he has described at length in his interesting "Diarium Italicum," the fame of the author of which warranted the publication, in London, of two English translations.‡

But not here do Montfaucon's labours end, the continuation into modern times of the task he had undertaken in the explanation of "figured antiquity" he planned and in great part executed. His "Monuments de la Monarchie Françoise" is a remarkable production. In no narrow spirit of idolatry to antiquity and its lessons he approached the subject of the monumental remains of France during the Middle Ages, and where no work previously existed to assist him in the smallest degree, he produced, in the early years of the last century, a work which, if it has since been superseded by later studies, has served as the scaffolding on which they have been built up. Like his work on antiquity, it is no mere sketch, supplied with incomplete information; the sources of reference show an acquaintance with the art of his country that is calculated certainly to amaze the modern reader when he remembers how, until positively recently, the art of the Middle Ages both in France and England was persistently overlooked.

Montfaucon's "Monuments de la Monarchie Françoise" gives us in passably accurate illustrations,—wonderful for the day in which they were produced,—a review of the artistic productions of the various reigns of the French monarchy; an historical sketch is given of each reign, and a fair share of text is devoted to the explanation of and authorities for each of the numerous plates that adorn the volumes. Through reign after reign the illustrations run, from earlier works than the Bayeux tapestry, which is here reproduced in a number of double folio page illustrations, and with an accuracy which, if it is no longer acceptable to those familiar with the photographs made of this interesting historic work, and published some years since by the Arundel Society, is still sufficient for almost all reference purposes.

The success of Montfaucon's "Monuments of the French Monarchy" was scarcely less than

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* This translation, "Antiquity Explained," was published at London, 1721-25, ten vols. in three, folio.

* "In the arts," Montfaucon remarks,—we quote Humphreys' translation,—"there are three things to be considered, the precepts, the instruments, and the works. Of the first of these we shall take no notice, it being both beyond our ability to treat of it, and also what would require as large a work as this collection." Of architecture he truly remarks that it requires the greatest number of instruments. He then proceeds to describe, with illustrations, the classic axe, rule, square, the compass, "one with straight the other with crooked feet"; the plummet, chisels made of brass, for, as he observes, the ancients were acquainted with methods by which brass could be rendered of great strength, plates of brass being used to bind the courses of stone [bronze is the metal, doubtless, meant by Montfaucon]; for the same purpose ties of wood were used in antiquity, shaped at each end in swallow's tails. The joiner's tools are also described,—the saw, the mallet, and plane, of which a somewhat rude representation will be found at p. 216 of the third volume of Humphreys' translation.

† Vinet's "Bibliographie des Beaux Arts."

‡ One published 1712, the second, by J. Henley, 1725.

that of his "Antiquity Explained," and, as in the case of that work, an English translation appeared (1750) embellished with no fewer than 300 plates. If Montfaucon's work has been long since superseded by later publications, the writings of Labarte, Du Sommerard, Alex. Lenoir, d'Agincourt, Lenandre, the far too little known Willemin, Viollet-le-Duc, and, more recently, Lacroix, in his popular works on the Middle Ages, like those students, we must never refuse our meed of gratitude to the industrious old antiquary who, after a youth spent as it was customary for the youths of noble families of those days to indulge in, left a brilliant military career, during the stirring campaigns of Turenne, to devote himself till his death at the ripe old age of eighty-seven, to the seemingly less alluring pleasures of deep and earnest study. Born in 1655, he renounced the world at the exceptionally early age of twenty, and entered the Benedictine order; a visit to Italy in the last years of the seventeenth century,—a visit undertaken in the interests of his literary researcb, and the result of which he has left in his "Diarium Italicum," to which reference has above been made,—is the only incident that may be said to have broken this long lifetime of devoted study.

In one of the quiet side chapels of the interesting old church of St. Germain-des-Près in Paris, now rest, within but a few feet of the ashes of the great Descartes, and not far from the last resting-place of the poet Boileau, the remains of Dom Bernard de Montfaucon, side by side with those of his brother Benedictine Mabillon, a scarcely less distinguished antiquary than himself. In accordance with an excellent and almost undeviating system adopted by the Paris municipality, and the absence of which is much to be regretted in London,—a street in the neighbourhood of St. Germain-des-Près bears the name of Montfaucon.

WARMING AND VENTILATION AT THE SANITARY EXHIBITION, SOUTH KENSINGTON.

ONE of the first things that strikes the inquirer in attempting to sum up the results of this exhibition in regard to warming and ventilation, is that in this department at least there is not the slightest pretext for the application of the epithet "International" to the Exhibition. The committee, doubtless, did their best to induce foreign inventors to send their works, but have not succeeded. The Exhibition merely illustrates what has been thought of and practically carried out in England. We wish it were otherwise. A really International Exhibition of Appliances for Heating and Ventilation might be very instructive in showing us how such matters are dealt with in other countries. As it is, the international element, as far as apparatus is concerned, seems to be summed up in the apparition of an "Anglo-German stove," which we noticed with that label affixed to it. Perhaps it may be contended that some not unimportant nations have scarcely turned their attention to ventilation at all, not having yet arrived at the recognition of its importance; and probably English sanitarians have done more than any others in promoting attention to the subject; but in the matter of practical means of ventilation we probably might find that the Americans and the French have done the thing more completely, in some instances, than we have. The first point, however, is to get it recognised as a primary principle that buildings for human habitation ought all to be provided with effective means of continually changing the air, not by haphazard, but in a certain and reliable manner, and that domestic architecture in which this is not accomplished is incomplete and radically faulty. There is evidence in the Exhibition that there are a good many means already within reach by which efficient ventilation may be secured, if people can be got to regard this as a *sine quâ non* in a dwelling-house. At present very few people do so regard it, and as no system of ventilation is costless, they draw back from paying extra for what they still regard as a luxury rather than a necessity in house-building.

Considering the ventilating appliances generally, we seem to find a great deal of repetition of contrivances differing little either in theory or practical working. Ventilating cowls warranted to create an up-current are to be found in slightly varying forms all over the exhibition, accompanied by models fixed on glass funnels with a bit of pith or cotton wool inside by which the drawing powers of the cowl can be visibly demonstrated. There is no difference in principle in these, and they all act properly in the models; but that does not take us very far. We all know how that an induced current is easily set up with contrivances of this kind: the real question is, Under what circumstances and in what direction are currents to be maintained for the production of ventilation? We find very little evidence of a real scientific principle in the conduct of ventilation in most of these contrivances and the methods of applying them. Inlets and extracts for ventilation must be considered conjointly and in regard to their effect upon each other, not separately. Ventilation consists in the provision of means for adequate inlet (without draught) and adequate extract, working in union with each other; and if it is decided on what principle inlet and extract are to be formed and regulated, the mechanical method of promoting extract becomes a mere matter of detail.

We may divide schemes of ventilation into three classes; those which may be termed natural ventilation, in which the difference of pressures between external pure air and internal vitiated air is relied upon to keep up the current; those which are worked by mechanical propulsion; and those which are in connexion with the heating system of the building, and actuated by artificial warmth. Among these there can be no doubt that mechanical propulsion is the most certain and effective, but it has the drawback that it involves a continual cost unless in the exceptional cases in which, as in buildings where machinery is constantly employed, a power already necessarily in action for the purposes of the building can be utilised to drive the ventilation also. It cannot, therefore, be expected that mechanical propulsion will come into general use for the ordinary run of dwelling-houses, although for the better class of houses Messrs. Verity's fan-propeller, driven by water, is a very useful form of ventilator. Its general use in large towns would involve too great a demand on the water supply, independently of the expense to individuals; but it is the only form of mechanical propulsion which we observed in the exhibition which would be at all suitable for even partial adoption for domestic ventilation.

Natural ventilation pure and simple may be said to have only one illustrator in the exhibition who lays special claim to that merit of naturalness. Mr. Boyle's system has this to recommend it in principle, that it follows the natural movement of air in an inhabited chamber, from the floor towards the ceiling, and extracts it from the upper part of the room. We have always held that the upper portion of the room is the place for the extract, and that it is absurd and unscientific to attempt to draw the vitiated air down again for extraction when it has once, heated by use, risen to the top of the room. On the other hand, admitting air through the skirting, even with the protection from direct influx which Mr. Boyle's apparatus provides, is too crude a method of inlet, and must create draughts along the floor when there is a fire burning. While the fire is burning, the current up the flue is supposed to assist in carrying off the vitiated air, the discharge for which is into the chimney, with mica valves light enough to open to the extract current, but closing the opening against back-draught. If the extract were made into a ventilation flue contiguous to and merely warmed by the smoke-flue, there would be little occasion for the mica valves, the proper action of which we very much doubt. And even if it were recognised as a success and universally adopted, where is all the mica to come from? Certainly a question to be asked.

There is another scheme which comes nearly under the head of natural ventilation, although it is rather complicated in its working, and that is the scheme propounded by Dr. Hayward and Dr. Drysdale, and shown in a working model of a house. Dr. Hayward's scheme (for it was his originally) was brought before the Institute of Architects and published in their Transactions some time ago, but the form shown in the Exhibition is modified in one particular, in that the "primary inlets," as they are called, are on the roof, whereas they were in the basement in the original scheme; the change has apparently been made with the view of getting purer air. The system, some of our readers may remember, is one in which no air is admitted into the house except through the contrived ventilating inlets, and no air suffered to escape except through the contrived outlet, which is an upcast shaft helped by the heat of the kitchen fire; in other words, the windows are fast and hermetically closed. The system appears to answer its purpose capitally, and to work exceedingly well; but it is useless to propound it, because no English people, except a few persons absorbed with fancies about ventilation, and willing to sacrifice everything to them, would ever consent to live in a house in which the windows would not open The system is very ingenious; it has just the drawback that no one ever would adopt it, and therefore it must be dismissed as unpractical.

In this scheme, we may observe, Dr. Hayward introduces the pure air from the "pure-air chamber," at the top of the room, and removes it also at the top, at the further side. Introduction at the top of the room we believe to be a mistake to begin with. Dr. Hayward speaks of the air as falling into the room through the inlet and then ascending again to the outlet. True, it will fall into the room if it is cold air, but it is then apt to cause draughts; if it is warmed before entering, it will not fall, and is likely to cross the ceiling to the outlet, without doing much good on its way. Our most decided and deliberately formed opinion is that the point at which to introduce fresh air into a room is a few feet, about 4 ft. or 5 ft., above the floor. Whether cold or warmed it has then the best chance of mingling with the air of the room, and at the same time of displacing and assisting to drive up the vitiated air, which, as we have before said, once up at the ceiling, should never be tempted to descend again. This we stand by as the proper system in regard to the points of introduction and removal of air. Introducing the air at the floor level is not in itself objectionable when the air is artificially warmed, but it is not so easy to warm it artificially, by the fire at least, for that level as for a higher level, and then there is the drawback that in summer, when the artificial warming is not in action, there will be draughts along the floor, and in fact that there ought, in that case, to be two inlets, one for winter and one for summer; whereas the inlet higher up will answer equally well in both cases.

Taking the instance where air is admitted without being warmed, we want in that case to have it introduced in such a way as to avoid direct draughts near its entry. This is what is effected by the much-vaunted vertical tubes which are now everybody's panacea for the production of efficient ventilation, but which have the drawback of sending the air too decidedly in a stream up to the ceiling, and of being harbouring-places for dust and dirt, and very difficult to clean or inspect. This has been so far recognised that canvas strainers, in the form of inverted cones, have been fitted to the tubes to prevent the influx of air bringing up dust and dirt; but this does not facilitate the cleaning of the tubes any the more. All the advantages of these so-called Tobin tubes are attained, without their peculiar disadvantages, by Stevens's drawer inlet ventilator, exhibited by the firm bearing the very big title of the "Universal Ventilating, Sanitary, and Engineering Company." This provides for the direct admission of fresh air through a strainer, and then between thin metal plates bent upwards so as to deflect the current upwards. The whole forms a metal box in the wall, and the inner portion can be easily removed for cleansing the interior. There is a ventilator nearly similar to this exhibited by Sharp & Co., but the Stevens's is the best. To be sure, the air will not do all that the patentees assert; it will not rise in so marked a vertical column as from the tube (which, however, is an advantage, though the patentees seem to think it is just the other way), and the air will not "gently warm as it ascends." Air is not so accommodating as that, and people who deal in ventilating machinery ought to know better than to talk such nonsense. The only sense in which the air can be said to "warm as it ascends" in such a case is that it gets mingled with the heated and vitiated air, which it ought not to do until it has been used by the inmates, and therefore it is desirable not to drive it up in colums to the ceiling, but merely to give it a little deflection upwards at entering, which is what this ventilation will do better than the Tobin tube. In fact, the patentees have done injustice to their own article in their indiscreetly-worded prospectus, which claims for the ventilator a power which it does not possess, and which it is the better for not possessing.*

* There is hardly any more absurd kind of literature, when one takes a quantity of it together, than these ventilating prospectuses, in which every man roundly asserts

Another method of introducing cold air, so as to neutralise or reduce draught is that of Mr. Ellison, who introduces air through a conical opening, widening towards the room, so as to disperse the draught. This acts very decidedly in the model shown, and acted upon by a pair of bellows; but we cannot say it is quite conclusive to us against the possibility of a distinctly unpleasant draught through such an opening. Mr. Ellison's "air diffusers," which are to some extent a further application of the same principle, are very serviceable, and have the merit of very neat appearance in a room. We doubt if they are better practically than Stevens's inlet, but they are better in appearance.

Mr. Banner's system of ventilation of sewers by means of an inlet acting in continuation with an outlet is fully illustrated by models, showing the form of the inlet, and the two forms of extract cowl, of which the revolving one is an original invention; the fixed one resembles in principle others that we have referred to. There can be little doubt that this system will keep sewers clear of stagnating unwholesome gases. It is like turning a stream of clean water through a muddy channel, carrying away all impurities with it. One or two other exhibitors show schemes on the same principle which seem to be pretty evidently copied from this one. While speaking of the purification of foul air we may call attention to one device, which is to be seen in another part of the exhibition, in the shape of an "artificial lung," designed for the purification of foul air, especially under such conditions as occur in the Underground railway. This is a kind of large network of tape depending from a tube filled with a solution of caustic soda, with which the net is saturated by capillary attraction, and the alkali in the water absorbs all carbonic acid and sulphur gases as the air passes through the net. The author gives a section of an air-purifying wagon containing a series of these nets, which is supposed to be pushed before each train in the Underground railway, and computes that thus all the air in the tunnels may be kept in a purified and healthy state at the expenditure of about one shilling per train each trip. It would be an interesting experiment to see tried, but we confess to feeling rather sceptical as to the result.

To return to house ventilation. In the class of ventilating systems which are assisted by artificial heat, there is a very original and apparently effective one patented by Mr. Pritchett, already briefly referred to in our pages, and especially designed for hospitals. This consists of a hot plate of two thicknesses of corrugated metal with hot water circulated between them, and which is applied to the wall behind a movable dado, and draws up a current of air behind the wall hangings, which are arranged so as to fall back slightly as louvres, opening upwards, and the warmed air is thus admitted in two or three layers at different heights on the wall; near the ceiling a similar but smaller heated wall-plate acts as an extracting force. The wall-linings in this case are Rees's patent metal tiles, offering a thin movable and washable wall-covering. In the model we can testify that the draught acted admirably, and the same system of corrugated hot-plates is applied by the patentee in one or two other methods of heating. It is a new and apparently a practical and practicable idea. Waller's hospital ventilating apparatus, in which ducts for both hot and cold air are carried along each floor, and can be opened or closed, or hot and cold currents mixed in varying proportions, in the neighbourhood of each patient, sounds very well in description; but will the hot and cold currents, entering the same apartment at the same place, be so obedient to direction as is anticipated? We have some doubt of it. Weeks's admirable hot-water coil, in which air is drawn up through the centre of each column in the coil, has been before commended in our pages, and is one of the simplest and most efficient combinations of warming and ventilation, as far, at least, as inlet is concerned; and it may act as a suitable inlet, in a kind of multiple Tobin-tube form, even for cold air, when the coil is not heated. Messrs. Verity's ventilating and warm-air apparatus, more in the ordinary stove shape, draws up warm air mechanically (by their patent screw-propeller) through a spiral coil of pipe which is heated by a central stove, but which receives the heat through a layer of water so as to avoid the unwholesome effect of air from an overheated metal surface. This also, by means of the propeller, will act as an inlet for cold air when the fire is not lighted.

On the whole, the exhibition shows that we are supplied with several good, and, in some cases, inexpensive, systems of combination of warmth and ventilation, in all of which hot water is the immediate agent for conducting heat. The utilisation of gas for heating purposes is, however, a very important branch of the subject of warming, as, if electricity, as seems very probable, take the place of gas for lighting, there can be little doubt that gas will be largely utilised as a heating agent, a function which it unfortunately fulfils at present, too often, in a way which is not desired. There are two or three comparatively novel ways of utilising this kind of heat which are worth notice for their ingenuity. Mr. Pritchett's "portable air-warmer" is, in the specimen exhibited, warmed by an oil lamp, but would be equally applicable to gas. It is simply a small collection of hollow metal chambers or tubes arranged vertically in a compact circle, and containing water which is heated by the lamp below. There is also an attempt to utilise the spare heat which does not pass into the water, by carrying it down in a descending flue to the level of the floor again, where it finds its way into the room through a strainer, which is supposed to keep back the more noxious products of combustion. This, however, it does not accomplish, as the "smell of the lamp" is very perceptible in the neighbourhood of the return tube, and would by little and little pervade the room. The heat saved is not worth this disadvantage, and the apparatus would be more satisfactory if the flue carried the products of combustion clear away. Ritchie's "Lux-calor" gas stove does profess to provide for this to a certain extent; it burns gas in a closed tube in front of a metal radiator, within which the gases from combustion are condensed and find their way as a liquid into a receiver below. Ventilation tubes for the supply of warmed air also pass up through the apparatus, discharging vertically at the top. The patentees show good testimony as to its innoxious use in green-houses, which is a strong test, but we fear the manipulation of the light would prove some little difficulty to servants. Schönheyder's patent sanitary stove, exhibited by Strode & Co., is a very clever thing, as a combination of light, heat, and ventilation. It is a tall columnar-shaped circular metal stove, with a gasburner about 5 ft. from the floor inclosed in a globe outside the stove. The fresh air rises through the lower part of the stove, passes by a duct through the gas lamp, feeding it and passing off through a flue up the centre of the stove, warming the air in the upper part, which then circulates in the room and is removed by an extract at the floor of the room. This is against our principles, and we doubt the satisfactory working of the extract, in all conditions of the room, but the apparatus does get a great deal of work out of one gas-light, and is very cleverly contrived. It should be understood that the gas and its products are entirely shut off from the atmosphere of the room. A drawback to it is that it is a large and by no means ornamental object in a room, though it might be made more pleasing to sight by decorative treatment. This question of the sightliness or unsightliness of apparatus for warming and ventilation not unfrequently obtrudes itself. Many of them might be much less ugly than they are with proper treatment, but the ideas of manufacturers and patentees on this subject are most original. One patentee tells us his extract-cowls "constitute an architectural ornament." We are much obliged to him, but we respectfully differ. Another, wound up to enthusiasm in the description of his own stove, observes that "the appearance is even more agreeable than the drawing indicates, as it has a handsome brass rim round the projecting part at the top." A handsome brass rim,—think of that! The most exacting "æsthetic" must be content!

Among the appliances for warming only irrespective of ventilation, the grates are mostly such as are known to those interested in such matters, and have been referred to and described in our pages before. Comparing the show of grates here with the immense variety of contrivances for utilising the fireplace in the best or supposed best manner which we met with in M. Planat's large work on heat and ventilation, which was reviewed in our columns some time since (vol. xxxix., pp. 663, 685), we cannot but feel emphatically how little this part of the show comes up to the profession of being "international," and how many suggestions and contrivances have been made in fireplaces of which there is not a hint here. There are Mr. Edwards's grates, which are known to our readers, and which are very good as economical heating grates; there is the "wonderful" grate, the patentee of which, perhaps, claims a little too much for it; there are several reversible grates, contrivances which we think have had their day and the advantages of which are somewhat illusory. Deane's open grate for burning anthracite as well as common coal is a good one; for anthracite there is a special draught created by closing the register door, when the products of combustion are conveyed down side flues and under the fire, and the greater part drawn through the fire again and "consumed"; this until the anthracite has got into a glow, when the register-door is opened and the grate operates in the ordinary manner. As to the working of this special draught on first lighting the anthracite we cannot speak from observation; but we did see anthracite burning in the grate, without smoke, which destroys the erroneous superstition some persons have that anthracite will only burn in a close stove. In fact, anthracite may be burned in a much simpler stove than Deane's. Steven's steam and hot-air heater deserves mention as a very economical and rapid manner of heating a coil (low pressure) to a moderate degree of warmth. The firebrick stove with terra-cotta gills communicating with a hot-air chamber, exhibited by Messrs. Rosser & Russell, shows a great amount of heating-surface for the space it occupies. There are few things, however, that show any speciality of principle worth comment. The grates are mostly more or less satisfactory applications of well-recognised principles, showing in many cases excellent workmanship. Once for all, however, firebrick backs will not last.

FURTHER NOTES AT THE MEDICAL AND SANITARY EXHIBITION.

RESUMING our notice* of the appliances and materials displayed in the International Medical and Sanitary Exhibition, we deal this week with the exhibits in the Eastern Quadrant, taking the stands in numerical order.

At Stand 351, Mr. C. W. Durham, of Chicago, U.S., shows the "Durham system of house drainage," which is described by the exhibitor as an application of the practice of gas and steam engineering to the construction of house drains. Under it, the water-closet system of a building is constructed as a distinct apparatus, independently of walls and floors for its support. A trapless water-closet (of any make) is described as being an essential feature of the system, "securing an uninterrupted flush of water" and "abolishing the disagreeable and indecent trap feature of ordinary plumbing." The full-sized model shown is, we are told, to be taken as a sample of construction only, and not of ventilation. In practice, it is sought to secure a thorough circulation of air through the pipes, which, by the way, are of cast iron with screw joints. The system is stated to have been largely introduced in the Western States, and to have been adopted for all the buildings in "the new manufacturing city of Pullman, Illinois," where two thousand brick dwellings are now in course of erection.

Mr. W. Ramsey (Stand 352) is an exhibitor of Jewell's "improved system of drainage and ventilation," including a double syphon disconnecting trap in stoneware, this trap being arranged with one water-seal above the other. The arrangement is compact, and is worth the attention of visitors. The "Priestley" drinking water tank (Ramsey's patent) is another speciality worth looking at. The cistern or tank is lined entirely with plate glass, and a glass ball-valve is used with it, so that the water stored in the cistern is not in contact with lead or any other metal. The same exhibitor's coloured glass leaded window-blinds are cheap and effective, and most of them fairly well designed. Their non-absorbent nature, and the readiness with which they can be cleaned, are important sanitary advantages.

The capabilities of "Spence's Metal," artistically and industrially, are shown at Stand 354,

* See p. 101, *ante*.

that his ventilator does everything, and no other is of any use at all. This is what Captain Marryat would have called "flap-doodle," which he defined as "the stuff they feed fools with."

where, besides a number of busts, is shown the application of the material for making air-tight joints to iron soil-pipes. The material, as our readers already know, is largely used by gas companies for the joints of their mains.

Mr. F. W. Clark (Stand 355) exhibits in action a portable gas apparatus for lighting and heating purposes. The gas is obtained from a hydrocarbon liquid known as gasoline. The apparatus and its product are well spoken of by architects and others who have used them.

The "Otto Silent Gas Engine," now so well known and so largely in use as to need no fresh commendation, is shown by Messrs. Crossley Brothers, at Stand 357.

Mr. James Wood (Stand 358) shows some handy commodes and disinfecting vessels for the sick room. They are exceedingly light, and their contents can be discharged without offence or risk of contagion by nurses or servants.

Stand 360 is occupied by Messrs. Bellman & Ivey, who have a good display of their scagliola marble, which, apart from its decorative value, is possessed of a non-absorbent and washable surface, and hence its use will be commended by the sanitarian.

Some concrete specialities are shown by Messrs. Charles Drake & Co., at Stand 361. Among them we may mention as specially worthy of notice a "marble concrete" bath, cast in one piece, and polished on the surface. The makers claim for this bath that its material and construction ensure perfect cleanliness, with, at the same time, a pleasing decorative appearance ("Marble concrete," we should say, consists of concrete with small chips of marble embedded in it, so as to give the surface an ornamental effect. It is capable of taking a moderately high polish on the surface). Other exhibits of this firm possessing a sanitary as well as a constructive and decorative value are the "mosaic marble jointless concrete pavement," in one slab 8 ft. by 6 ft., with Grecian scroll and border lines in red, black, and white marble concrete; and mosaic marble hearths, wall-tiles and slabs. The firm also show their method of monolithic concrete building and fireproof flooring. This stand, like many others we have named, merits more than a passing glance.

Concrete in its constructive applications is shown by Mr. Alfred Walker at Stand 362. A speciality of this exhibitor is his "granite and iron slag concrete," which has been largely and successfully used for warehouse and stable floors, railway platforms, footpavements, carriage-drives, &c. Many architects and railway engineers have used these materials, and they have given great satisfaction. The iron slag concrete forms a good fireproof floor by completely encasing with it iron girders and joists. Mr. Walker's concrete sewer culverts, made either in sections with lap joints, or in one piece, are well worthy of notice. At the same stand is shown Phillips's "Reversible Window," which consists of an arrangement of the ordinary window-sashes so as to permit of their being completely cleaned, painted, or repaired, from the inside.

The Eureka Concrete Co. (Stand 363) are exhibitors of warehouse and stable floors, sewer culverts, &c., and of Nichols's patent arrangement for laying gas, water, and other mains so as to prevent roads or pavements being disturbed when such mains require repair or renewal.

The Wortley Fireclay Company (Stand 365) exhibit earthenware pipes fitted with Jackson's air-tight, gas-tight, and water-tight joint, suitable for either sewer or water-pipes. They are also exhibitors of some good glazed bricks, white and coloured, made of Leeds clay.

Mr. T. J. Constantine (Stand 366) exhibits his "hot-air radiating and coal-economising slow combustion 'Treasure' stove," and his "Treasure" cooking-ranges; very good.

At Stand 367 Mr. William Hellier shows his water-heater, for domestic purposes, and the same apparatus in conjunction with a coil for heating purposes. Either gas or hydro-carbon oils can be used for the heater.

The Anthracite Coal Company assert the sanitary value of their smokeless coal at Stand 368.

Stand 372 is occupied by Messrs. Quirk, Barton, & Co., with specimens of their patent tin-lined lead-pipe, for preventing lead-poisoning in water, beer, and other liquids. The thin inner casing of block tin is so firmly united to the interior of the lead pipe that no amount of contortion or twisting appears to have the slightest tendency to separate the two. This piping is drawn complete at one operation by special machinery, the lead and tin being firmly pressed together and united in the process. A useful material exhibited by this firm is their thin laminated sheet lead, for preventing damp coming through walls.

Mr. Joseph Constantine (Stand 374) shows his patent "Convoluted" stove for warming churches, chapels, and other large buildings,—a very good one.

Mr. Robert H. Griffin (Stand 375) shows a register stove designed to be smoke-consuming and to admit fresh warmed air to the apartment in which it is used. It is constructed to burn coal, coke, or anthracite. Some remarkably strong testimonials in its favour have reached us.

Messrs. S. Leoni & Co. (Stand 376) have a number of gas-stoves and kitcheners on view; also hot-plates, ironing-stoves, &c.

At Stand 377 Messrs. Faraday & Son are exhibitors of some very good ventilating and other gas-fittings. By simple means they seek to carry off direct from the burners the deleterious products of combustion.

Dr. P. Hinckes Bird (Stand 378) exhibits his simple and costless means of natural ventilation, first described by him in the *Builder* many years ago. They are unpatented, and any one is free to use them. In many instances their use would be more effectual than that of one-half of the more elaborate contrivances since put forward.

The Silber Light Company (Stand 380) show a number of burners so devised as to get a maximum of illumination whether with gas or oil.

Messrs. Gillow & Co. (Stand 381) are exhibitors of lavatories, specially designed for a limited space, and made of earthenware and walnut.

Mr. C. E. Stevens (Stand 383) exhibits his patent "Steam and Hot-air Heater" for warming buildings. It has many good points to recommend it. A small quantity of water is kept supplied to the copper reservoir above the gas or lamp inside the iron casing, by a supply cistern with a regulating ball-valve, or by a self-acting reservoir with stand, which is connected to the heater by a pipe, and, when lighted, the heat causes the small quantity of water to be turned into steam, which is driven through the pipes, an outlet being provided for the escape of the steam at the top. Stevens's circulating water-heater, for supplying hot water to baths, hand-basins, sinks, &c., is also worth the attention of visitors.

Mr. Thomas Lloyd (384) exhibits a working model of a new patent "shut-up staircase or steps," which may be lowered or raised at pleasure, with the view of gaining or cutting-off access to factories where the precious metals are worked; it would be very useful in many situations. It is the invention of Mr. Ernest Day, architect, Worcester.

At Stand 385, Messrs. Gilmore & Clark show their "Autothermarkon," or self-heat-ruler ventilator, and their "induced-current" air-brick; but their speciality is a recently patented chimney-cap, called the "Scientia," which should be looked at.

Drs. Hayward and Drysdale, of Liverpool (Stand 387), show a large model, illustrating their system of self-acting ventilation by suction power, of which we have before now spoken.

Mr. James Howorth exhibits, at Stand 388, his well-known Archimedean screw and other ventilators, which are favourably known and have been largely used.

Ventilators are also exhibited at Stand 389 by Messrs. C. Kite & Co., who show, among other kinds, a speciality which has been approved by the Metropolitan Board of Works for cow-shed and stable ventilation.

Stand 390 is held by the Universal Ventilating, Sanitary, and Engineering Company, who show Stevens's "Exhaust" and "Drawer-Inlet" ventilators, and Stevens's "Exhaust" chimney-tops. They have all been noticed by us on previous occasions.

Messrs. Comyn, Ching, & Co. (Stand 391) exhibit Thomas Boyle's patent ventilators in various forms. They have been long before the public, and are of proved efficiency.

Bullivant's "air-tight and noiseless" sliding sash-window is exhibited at Stand 392. It appears to be simple and efficient, and has been used by many well-known architects.

The "Anti-Accident" sash, exhibited by Mr. Robert Adams (Stand 395), is somewhat similar in principle to that last mentioned, and is well worthy of notice.

Messrs. Smith & Turner (Stand 397) show Ben Turner's patent adjustable regulating door-spring (largely known and widely used), and other appliances of the kind, including an improved water-bar for French casements. A useful article shown by this firm is Hughes's fountain clothes-washer, which is placed upright in the washing copper or boiler and causes the water to circulate over and through the clothes as long as the water boils.

The "Filtre Rapide," a useful appliance for industrial and domestic purposes, is shown by Mr. P. A. Maignen at Stand 401.

Messrs. Matheson & Gardner (Stand 403) are exhibitors of lead-incased block-tin pipes for water.

Messrs. Benham & Sons (Stand 410) have one of the best and most useful displays in the exhibition. Their "Anglo-German" porcelain stoves are an English improvement on the German porcelain stoves, inasmuch as they are sold complete, ready for fixing, instead of requiring to be built up and fitted together tile by tile, on the spot. The external surface is entirely of glazed enamel. The well-known ventilating globe light, for gas, made by this firm, is shown fitted-up. A disinfecting oven or chamber, heated by gas, and a chamber for the same purpose in which steam is either admitted directly in contact with the articles to be purified, or which is heated by admitting the steam between the jacketed sides of the chamber, are shown. In the one heated by gas, iron plates are provided for spreading the heat, and on these plates sulphur or some other fumigating agent can be used. A hospital ward kitchen-range, with oven, boiler, hot-plate, &c., heated by coal and gas combined, or separately, is likely to be very useful. When the fire has been let out, the gas can be used for the hot-plate. An interesting exhibit is the series of articles of hospital furniture made by this firm for the Evelina Hospital for Sick Children, Southwark. Benham's hospital slop-sink, as used at the Radcliffe Infirmary at Oxford, is worthy of the attention of visitors. Their ventilating kitchener, the "Davey" washing-machine, a centrifugal wringing-machine or "hydro-extractor" for laundries, and Dr. Siemens's improved gas-fire for burning anthracite, are other items in Messrs. Benham's interesting and valuable collection of exhibits.

At Stand 411, Messrs. Chorlton & Dugdale show an exceedingly handy contrivance under the name of the "Sunlight" stove. It is compact and convenient in arrangement, and will cook for a large number of people. By the simple addition of a coil inside the stove, a supply of hot-water for baths, lavatories, &c., can be obtained. The coil can be readily detached at any time, the stove being workable either with or without the hot-water apparatus.

The well-known firm of Musgrave & Co., of Belfast (Stand 412), exhibit their patent slow-combustion stoves and air-warmers, which have undergone several improvements, especially in the mode of feeding. They will burn for from eight to twenty-four hours without attention. Another speciality shown by Messrs. Musgrave is the patent "Ulster" smokeless stove grate. It somewhat resembles a register stove grate, but is provided with a chamber, fed from above the back of the fire, for holding fuel. As the fire burns away, it is replenished by the fuel contained in the chamber, but the fuel so stored cannot become ignited until it reaches its proper position in the fireplace. The heat of the fire causes the fuel contained in the chamber to part with those constituents which form the heavy smoke passing into the chimney every time an ordinary fireplace is fed with fresh coal, but in this stove they are made to pass through the fire and to be consumed. Any coal, and even slack, can be burned in this stove.

Mr. Francis Hammond (Stand 413) shows a ventilating globe gas-light and other gas apparatus.

At Stand 414 Messrs. Weeks & Co. show their excellent "hydro-caloric" coil (which we described and commended not long since), together with their patent "economical boiler," with super-heating tubular furnace-bars, and a vitiated air-extractor applicable to the cornices of rooms.

At Stand 415, Mr. R. Renton Gibbs shows in a very complete way his patent system of heating by means of hot water. His apparatus, in its simplest form, consists of an endless metallic

tube of small diameter, through which there is a rapid circulation of hot water. A portion of the tube is coiled up, so as to surround and contain the fire, and the remainder is disposed in the way most convenient for the attainment of the end desired. Mr. Rentou says that experience has demonstrated to him that only one size of piping is required for all classes of apparatus large or small, and he has found that the most convenient dimension for the pipe is $1\frac{5}{16}$ in. diameter, outside measurement. Mr. Gibbs's system has been largely used by architects and others, apparently with much satisfaction. In Mr. Gibbs's "hot-water grate," a coil of pipe is fitted to an ordinary sitting-room fire-grate, forming a boiler in itself, and yet preserving the cheerful appearance of an open fire. The bars themselves are hollow, and form part of the coil. By means of this grate it is asserted that three or four bedrooms may be warmed from the dining-room or study fire. Mr. Gibbs also exhibits his "air-cleansing prisms," for hospital and other windows. The prisms are in reality merely V-shaped troughs of glass carried horizontally and close above one another across the window opening. Water is admitted from the top of the window into the top trough, whence it passes through a narrow slit in the form of a thin film or sheet into the trough below, and so on until it reaches the bottom of the window, where it finds an outlet. The prisms or glass troughs form a kind of louvre, and the air passing between them when the water is running is cooled and cleansed.

Messrs. Verity Brothers (Stand 416) exhibit in action their patent ventilator or air-propeller, capable of being easily applied wherever there is a cistern, the fans which propel the air being actuated from a fly-wheel which is driven by two pin-hole jets of water. Messrs. Verity also show their patent combined fan and screw exhaust ventilating head, actuated by wind-power. This ventilator has been adopted for the meeting-room of the Royal Institute of British Architects, Conduit-street. The same firm exhibit a patent ventilating and warm-air apparatus, and the "Osborne" combined boiler and coil,—the latter heated by gas.

Messrs. Frederick Edwards & Son (Stand 417) show their "New Smoke-Consuming Slow-Combustion Grate," the invention of Mr. Frederick Edwards, jun. In it Mr. Edwards adopts the principle of putting a body of coals sufficient for a day or a night's consumption into a fire-basket or chamber, making a fire in the common way on the top of the body of coals, and allowing the coal to burn gradually downwards until the whole is consumed. This principle is substantially the same as that adopted in Dr. Arnott's grate, and in the modification known as the "*Builder* Fire." We are told that it also resembles, in some particulars, a grate patented by Mr. Goodchild, an architect of Guildford, in 1857. We have not space to describe it in detail. It should be seen and examined by visitors. By its adoption Mr. Edwards maintains that the following advantages are gained:—(1) A practical immunity from smoke. (2) A fire that will burn from morning till night or from night till morning, with little or no attention. (3) No chimney-sweeping, except, perhaps, once in ten years. (4) No coal-scuttle required except at the time of lighting the fire.

George's patent "Calorigen," in two forms, for coal or gas, is shown by Messrs. J. F. Farwig & Co., at Stand 418. The "Improved Patent Slow Combustion Calorigen," for warming and ventilating, will burn for twelve hours without attention. The improvements embodied in it are important, and calculated to render it increasingly useful.

Stand 419 is occupied by Messrs. R. W. Winfield & Co., who exhibit metallic bedsteads, cots, and furniture applicable for hospital and general use. They have a good display of domestic brass-work, in the shape of fenders, fire-screens, and spark-guards, and a large show of lamps, brass chandeliers, and gasfittings generally.

Messrs. Thomas Potter & Sons show at Stand 420 the "Thermhydric" ventilating hot-water open fire-grate, the invention of Mr. H. Saxon Snell, architect, by whom it has been applied in several of the large parochial and charitable institutions which he has erected in the metropolis and elsewhere. It has on more than one occasion been described by us. Exhibited by the same firm, and devised by the same inventor, is a smoke-consuming revolving fire-grate. It is so constructed that the grate or fire-cage containing the coal or other fuel is made to revolve upon a pivot in such manner that, when fresh fuel is placed upon the top of the fire, it is, by the inversion of the grate or fire-cage, brought undermost, and thus the products of combustion are more perfectly consumed than in the ordinary open fireplace. The working parts are few in number and simple in character.

At Stand 422, Messrs. Hobbs, Hart, & Co. exhibit, besides safes and iron doors for various purposes, numerous specimens of locks, lock furniture, and fittings, adapted for asylums, hospitals, and buildings generally. This firm, as usual, maintains its position.

Messrs. J. L. Bacon & Co. (Stand 423) exhibit their well-known hot-water apparatus, which consists of an endless circuit of wrought-iron tubes of special manufacture, $1\frac{7}{16}$ in. in external diameter, and $\frac{7}{32}$ in. thick, the ends of which are provided with right and left handed screws. They are connected together by means of sockets (also screwed right and left hand), which draw the ends together and force them one into the other, thus making a strong and sound joint. A portion of the circuit of tubing, built into a furnace at the lowest level, supersedes the ordinary boiler. This method of warming is convenient and economical, and hence it has been, and will continue to be, largely adopted.

Several ingenious novelties are shown by Messrs. Archibald Smith & Stevens at Stand 425. First and foremost we must name the "Wonderful" Grate (Russell's patent), which was fully described not long since at a meeting of the Royal Institute of British Architects, as reported in our columns at the time. It is smokeless, and burns anthracite coal, coke, or cinders. It is self-feeding; the fire is always bright; the intensity of the fire can be regulated at pleasure, the fire will burn for twenty-four hours without attention, and it has other advantages which must be seen to be appreciated. The stove is shown in action in the Exhibition. A cheaper form of the stove is made and shown, no doubt quite as effective as the one of which we have been speaking, but not so sightly. This defect in the appearance of the cheaper form of the stove will, it is to be hoped, be remedied. Russell's patent "Binate" door furniture, exhibited by the same firm, is the very embodiment of simplicity in this direction. The pair of knobs are made in one solid piece, and by a very simple and efficient arrangement, are keyed on to the door by the insertion of the lock, so that the lock would have to be taken out of the mortise before the knobs could be removed. The same exhibitors show the patent weather-tight "Janus" fastening for French casements, their anti-friction door-stop, and a weather-tight sill-bar. All these appliances are good and useful, as is the "Janus" adjustable door-spring, with regulator top-centre.

Messrs. Strode & Co. (Stand 426) are exhibitors of sun-burners for gas, and of electrical apparatus for lighting gas. They also exhibit Mackenzie's electric lamp, and their improved gas-regulator. A novelty shown by them is Schönheyder's "Patent Sanitary Stove," which seeks to light, heat, and ventilate a small room at one and the same time. Gas is the heating and lighting medium. Fresh air is drawn in from the outside of the house by a special inlet, and this is warmed by passing through the body of the stove, which is in the form of a pillar, some 5 ft. or 6 ft. high, the argand burner used for lighting the room and for heating the stove branching out some 5 in. or 6 in. from the face of the pillar, into the interior of which the products of combustion are conducted and utilised for heating purposes.

Stand 427 is in the occupation of Messrs. Rosser & Russell, who are exhibitors of a variety of good and useful heating and ventilating apparatus. One of their exhibits is the "Leopold" reversible grate, which will, it is asserted, consume its own smoke, and burn for eight hours without attention.

Messrs. Deane & Co. (Stand 430) are exhibitors of Crane's patent register grate, which we lately noticed somewhat in detail. It is claimed for it that it burns anthracite as easily as ordinary coal, that it effects a great consumption of smoke, and that it thoroughly ventilates the room in which it is used, thus combining the heating powers of the close stove with the healthiness of the open fire-grate.

The exhibitors of the "Radiator" cooking-range (Macphail's patent), shown at Stand 431, claim great things for it.

Messrs. J. Defries & Sons (Stand 433) show their "granulated pumice-carbon filters," in various forms and sizes.

The Sun Auto-Pneumatic Lighting and Heating Company (Stand 436) exhibit their "Sun" gas-making machine,—probably the best apparatus of its kind. It is largely used for churches, mansions, and other buildings which are at a distance from gasworks.

Messrs. Woollams & Co. (Stand 439) are exhibitors of some good wall and ceiling papers, which, being free from arsenical and other poisonous colours, are worthy of notice by sanitarians, and, indeed, by the public generally.

Messrs. Thomas Bradford & Co. (Stand 441) exhibit their well-known washing machinery, now to be found in many large and well-appointed laundries.

Parquet-flooring, impervious to dust or dirt, is shown by the well-known firm of Howard & Son at Stand 442.

We have now made mention of all the principal appliances and materials exhibited in the sanitary section of the exhibition, but before concluding we may call attention to a map exhibited in the Western Gallery (No. 80) by Mr. Henry Newman (late City Surveyor, Winchester) and Mr. S. J. Newman, A.R.I.B.A., Northampton, showing a scheme for providing London and other places in the Thames Valley with a good supply of water. It is proposed to collect the water from the highest portions of the Thames water-shed, where it is believed that a good supply of pure water may be obtained comparatively free from the contaminations and impurities found in surface or river water if taken or collected at low levels. It is proposed to bring the water to London by conduits or tunnels kept at convenient depths below the surface, save in some places where it would come to the surface of the ground, the Northern tunnel terminating at Chipping Barnet Common on the north of London, and the Southern tunnel, between Merstham and Gatton. From reservoirs at each of these points it is proposed that the water should be conveyed in iron pipes to suitable points for connexion with the present mains, so distributing the water by gravitation throughout London and suburbs. In its completed form the scheme would make provision for the supply of water to every place requiring it within the Thames water-shed.

The Exhibition will remain open until the 13th of August; and we urgently recommend our readers to visit it.

BIRMINGHAM AND ITS TRADES.

ONE of Whittier's tenderest poems happily hits off Birmingham. Speaking of Joseph Sturge, he adds that the city of that good Quaker's love was "swinging its clamorous iron flail." Few can visit that great mart, manufactory, and mouthpiece of the Midlands without learning that large as is the opinion that it has of itself and of its value, that opinion is justified; for it is one of the chief of our British wonders. Its name is supposed to tell of the broom that grew plentifully near it in the past. It is claimed that it was an important town before the days of the Romans, to have manufactured arms; as Elihu Burritt puts it, some have believed that they made tools for Cornish miners in the days of the Phœnician traders; that the scythes for the chariots of the ancient Britons were here made; and that the "lineage of its iron and copper workers runs back to Tubal Cain without a break." But in any case, the records of the town from the days of the Conquest to the reign of Charles I. are few. In the Civil War, the people of Birmingham were on the side of the Parliament, and brawls and battles were known in it. In later days, the anniversary of the French Revolution witnessed those riots in which Unitarians and Priestley suffered; and beyond these, till the days of Attwood and of later political leaders, little is known of the great town but its steady growth and the development of its wonderful industries. Peace, law, and order became the motto of Birmingham, and trade has been its ideal.

It is wonderful to look at the town now, remembering what it was forty-five years ago. It had grown from the small town,—with one street "a quarter of a mile long," as Leland describes it,—even then, to one noted for its public spirit and its vast works. The carriageways were generally "formed on Mr. Macadam's principle, but many of the footpaths were uncomfortable, being paved with small stones." The water-works had been recently established; the town-hall, just completed, was "as chaste and magnificent a building as any erected in modern times." The "new market-hall" was completed, and

many of the improvements in Birmingham were in course of being carried out. At that date the municipal concerns were overlooked by one hundred commissioners; the officers of the town were high and low bailiffs, and a chairman of the court leet, whilst two constables and a headborough survived. The first two members of Parliament had just been elected. There were ten churches, many dissenting chapels and other places of worship, whilst the philanthropic institutions were comparatively numerous. The population of the town,—4,000 in 1690, and 73,670 in 1801,—had risen by 1831 to 146,986. It was, in the words of Burke, the "toy-shop of Europe," but, as we shall see, a wonderful one: firearms, buttons, buckles, iron, gold, silver, pens, glass, copper, and brass, were amongst its productions and the materials it worked with. At that day the post-office was at "Bennett's-hill, New-street"; there were nine bankers, six of whom survive now; three newspapers,—all weekly; two gas companies, and a water company. Almost countless numbers of coaches left the Swan and Castle, the Swan, the Albion, the Castle and Saracen, and other inns; columns of carriers fill the pages of the old directories; there were fly-boats and packets by water, but apparently the railway was not, and the directory then runs to seed in a dry list of names of tradesmen and manufacturers in countless industries. There was energy and activity in the town in those days; public spirit of a high order, and a determination to seize on and to make the most of all the advantages that the position of the town or the multiple benefits flowing from the possession of coal and other valuables near it could give it. And it is to that desire, to that public spirit, and to that energy in trade and in corporate matters, that the proud position of Birmingham is now due. Some of the ancient orders of the town have passed away, but newer and more popular bodies have arisen to do corporate service, and watch over and advance with a rare fidelity and devotion the public interests of the growing town. The town of Watt, of Boulton, and of Priestley, has not stood still; indeed, it may be questioned whether the advance has been so great and so continuous generally in the case of any other of the great centres of population. As a great town it is a young one, and hence it has not much to show of the ancient in its buildings, but it has, in place of these, the evidences of public spirit, of wealth, and of abundant taste.

The great town-hall, which has been called the "most symmetrical and classical building in England," with its powerful organ; its fine grammar-school, its colleges, schools, hospitals, stations, and churches, the council-house, and some of the great warehouses and workshops, attract attention, and attest the fact that, of late, Birmingham, whilst regarding utility, has also had an eye to architectural beauty. But it is as a manufacturing place and as a mart that it first claims the notice of the visitor, for it is this that stamps its character primarily upon it. Its trade is great in nuts and nails, in tubes and tins, in tools, pens, bolts, guns, electro-plate, wire, stoves, heating apparatus, bedsteads, and the countless varieties and forms into which iron and steel are shaped. In the days of Hutton it was said that Birmingham was "small in her size, homely in her appearance, and coarse in her dress, her ornaments being of iron from her own forge." It has been greatly changed since that day, but perhaps the greatest of the changes that have been known is that of her industries. It was said a few years ago that the glass trades alone gave employment to 1,500 persons; that buttons claimed the labour of 6,000 more; and that the extent of the gun trade and its labour needs were indicated by the fact that, in three years, there were turned out for the British Government not less than 231,000 stands of arms, and upwards of one million for other powers and persons. Birmingham is not one of the chief centres of the heavy iron trades,—it could scarcely, with its present position, be one of the great producers of pig-iron, for instance, —but in the use of iron and steel, in the production of "toys" of one class or another, and in the production of many of the chief of our daily requisites in steel and iron, it is still the market of the world, and, to some extent, the manufactory also. The two leading firms in the bellows trade, for instance, often send out 500 dozen weekly in the autumn; of one class of axe alone, one maker sends out 2,000 dozen yearly; of iron wood screws the two principal makers can produce 300,000 gross weekly,—an almost incredible number; one firm in the nut and bolt trade employs 3,000 persons; and at one establishment 1,000 cheap clocks have been made in a week. At the Proof House, about half a million barrels are proved in the year; the weekly production of wire birdcages by one firm is a thousand; whilst pens are produced by the great makers at such a rapid rate that they are counted by the million and gross of millions. These figures may be said to be in some degree illustrative of the development of many of the industries in Birmingham; and in galvanised iron, in tinplate, stamped and japanned wares, in almost every manufacture of the metals, from the presents for the "little stranger" to the coffin-plate that records a death,—for every age and for almost all circumstances, Birmingham is the mart if not always the manufactory. It has coal and pig-iron near it; it has manufactures in and all around it; and it has a population which has the inherited skill in manufacturing operations of many centuries, so that it is not to be wondered at that it has attained and still retains greatness, and that it has built up for itself a trade that of its kind has no competitor so great. It is the variety and the extent of its trades that prevents it feeling depression to the same extent that some other towns do, such as Sheffield, for instance, in the periods of dulness in the iron and steel industries. And it is a somewhat singular fact that from that district it obtains some of its raw material, converts it into manufactured goods, and sells the latter at such a price as allows of no competition, even on the part of the town from which it obtains the raw materials it so manipulates.

But Birmingham has a soul above buttons, to use an appropriate simile. Its Town-hall, the Institute near, and the College and the Council House, are proofs of the public spirit it possesses; whilst Aston Hall and its grounds, with other of the public parks, show that the dwellers in the iron town have a longing for more than the mere show of stately buildings; and the investments in lands for the welfare of the people are noble proofs of public spirit rightly applied. And though it is needless to give the figures, yet it cannot be forgotten that the great works of public improvement that have been carried out by the Corporation of Birmingham are works that will for all time stamp with credit the councils that planned and executed them, and the citizens who incurred the cost for the adornment and the general improvement of their town. In that poem of Whittier's, to which we have referred, there is mention made of "the smoky veil" of Birmingham, and though it remains, and is likely yet to remain, there has been something done to render it endurable to those whose circumstances force them to remain "in populous city pent." We have glanced at the growth of the great trades, and it may be said that if the manufacturers of Birmingham are true to themselves there will be further growth. It is true that there is greater competition, and that Birmingham does not hold a monopoly of the manufactures of the world. But it is also true that the uses of iron and steel are growing, and the wants of the people must be supplied by those who produce best and cheapest. It may be that in some parts of the cost of production there can scarcely in Great Britain be a reduction, but in others it is possible. There has been of late an abnormal growth in taxation, both local and imperial, which must be not only checked, but there must be also an immense reduction, so that our manufacturers may be better able to compete with great nations that are becoming manufacturers, and that are not burdened with heavy taxes as in Europe. There must be a readiness also to adapt the style and form of the production to the needs of the user,—even to his whims,—and there must be also a cheapening of the cost of production with an improvement of the quality. With these, and possibly with the reduction of the cost of transit, the position of Birmingham should be improved. The coal and iron near it, the many villages and towns that in the iron and steel trades contribute to its commerce, the hordes of industrious workmen, and the enterprising merchants, should make it a greater town in the future than it is in the present. The sun has not set on our manufactures yet, nor will it if our vast capital and our great labour can be more firmly united to meet that international competition which seems setting in, especially in the metallurgical industries and the metal trades.

DULWICH COLLEGE GALLERY.

IT was but the other day we were conversing with a friend who remembered well the removal in 1814 of the famous collection of pictures which now form the Dulwich Gallery from the house of his neighbour, Mr. Desenfans, in Charlotte-street, Portland-place, where the pictures had reposed for some years in the possession of the Royal Academician, Sir Francis Bourgeois. Desenfans, whose memory is, we imagine, scarcely sufficiently associated in the public mind with the Dulwich Gallery, had collected at the close of the last century a number of pictures for the then king of Poland, Stanislaus. This worthy king, however,—whose character Carlyle, in his "Frederick the Great," has amusingly sketched off in his most summary manner,—did not "come to his own," leaving the collection on the hands of Desenfans. A sale dispersed a large number of the pictures, but the remainder, considerably added to, he left on his death to his wife and his old friend, Sir Francis Bourgeois. It is to Sir Francis Bourgeois that the formation of the Dulwich Gallery is usually attributed, and with justice; the claims of his old friend, Desenfans, and the actor, John Philip Kemble are, however, deserving, as we have already remarked, of more recognition than they generally receive.

Sir Francis Bourgeois, with a wisdom and liberality entitling him to take really the first place in the ranks of the promoters of the fine arts in England, was very desirous to carry out in every point the wishes of his unusually sympathetic friend Desenfans, whose scientific knowledge of art convinced him that without its immediate influence a technical knowledge was unobtainable. To this end he had warmly impressed on Bourgeois the importance of the gallery being retained if possible in London,—in fact, on the very spot in which it had been carefully brought together; but on Sir Francis applying to the then Duke of Portland with a view to the purchase of a reversion in fee of the three houses occupied by him in Charlotte-street, in order that the collection left him by Desenfans might become a permanent exhibition, the Duke did not approve, even if he were certain that he had the power to sell the reversion of his estate in "Marybone," as he writes it in his curt and ill-spelt reply to Sir Francis Bourgeois.* It was at this point that his friend Kemble suggested, with characteristic sympathy for the old Elizabethan actor, Edward Alleyn, that the pictures should be left to the masters and fellows of God's Gift College, Dulwich. Sir Francis, by ample pecuniary bequest, left sufficient to add a wing to the College; the then popular architect, Sir John Soane, the famous architect of the Bank of England, was employed to erect the pleasant gallery with which so many of us are but too little familiar, and which really forms one of the most perfect and charming small collections of pictures in Europe.

Sir Francis Bourgeois died, and, not long after him, Mrs. Desenfans. That lady, in conformity with the wishes and known intentions of both her husband and her old friend, in her will bequeathed the sum of 500*l.* to the Dulwich College for the purpose of fitly entertaining, on their annual visit, the President of the Royal Academy and the Academicians; and, like a practical and worthy housewife, she further desired that "in order that the said annual dinner may be properly and suitably given, I do hereby bequeath the following articles to the Master, &c., of Dulwich College, which I direct shall be preserved by them, and never be used on any other occasion, for any other purpose whatsoever, viz., three dozen of silver plates, with the arms of Noel Joseph Desenfans, esquire, engraved on them; a silver bread-basket, with ditto; four dozen of silver forks engraved with his crest; one dozen of silver spoons ditto; six salt-spoons ditto; a large silver waiter; two small ditto; three dozen of ivory-handled knives, the blades steel and plated; a complete dinner-service of china dishes; a dessert-service of five pieces, with two dozen of plates; a large mahogany dining-table with table-cloth; four plated bottle-stands, with decanters and glasses; a mahogany press with shelves and drawers to be placed in an ante-room containing the above articles." Mrs. Desenfans left in addition a number of pieces of furniture, "a sofa and ten chairs covered with green

* See the correspondence in appendix to the new and excellent catalogue of the Dulwich Gallery.

velvet; two commodes with drawers inlaid with brass and tortoiseshell; two ebony tables with gilt legs"; a French clock, with many other interesting objects immediately connected with the annual dinner, which, for sufficiently good reasons, she wished should be changed from St. Luke's day to the second Saturday in May, or "any other more convenient day of that month in every year." Need we say that the somewhat incongruous pieces of furniture that occupy the last room of the gallery are the same that Mrs. Desenfans specially mentions in her will?

Of the curators, Mr. Denning, who succeeded Mr. Cockburn, is, perhaps, the best known. As an artist his name is familiar to a few sincere lovers of art and the fewer favoured collectors of English works, but above all to the rapidly dying-out band of professors of the great art of the engraver,—artists who have added so many triumphs to the history of English art. To Denning we owe not a few of the famous engravings of modern times.

It is at Dulwich, and especially it was so thirty or forty years since, when people did not go abroad as much as they do now, that the English art-student first becomes acquainted with the charm of Velasquez as a portrait-painter; years ago we believed that at Dulwich we could study at least two Velasquez: we now learn and are correctly informed, as enlarged experience shows us, that the smaller Dulwich Velasquez is but a reduced copy of the original at Madrid; but although this is clearly the case, the comparison with a memory of the original and this copy years ago is exceedingly instructive. From the second picture, a genuine Velasquez, the portrait of Philip IV. of Spain, we are able to form a tolerably perfect judgment of the extraordinary art of that great Spanish painter, whose rapidity and certainty of execution were so wondrous that Sir Joshua himself, in referring to him, said that Velasquez did at once what it took him (Sir Joshua) many hours and many failures to approach.

Notwithstanding that we have pronounced the collection at Dulwich to be one of the most perfect small collections in Europe, its perfection consists in the rarity of specimens of about thirty or so painters, almost entirely belonging to the later schools,—perhaps the only really fine Italian picture being no earlier than that of Paul Veronese, a portion of a work in four parts, all of which, strange to say, are in England, but dispersed in various collections. Admirers of the early Italian art, the admiration for which seems still to be growing as we get a better understanding of the history of art in the period which culminated in so much beauty in Florence during the early years of the fifteenth century, will find but little at Dulwich to study; but at Dulwich are to be seen not only some historical English portraits of the highest importance, but many exquisite Dutch pictures full of instruction and leading to inquiry on the most interesting artistic questions. One of the treasures of the Dulwich Gallery is the "Fête Champêtre," by Watteau, superior, probably, to any of the Watteaus of the Louvre. It is one of those fascinating little compositions of the master in which are gathered together a number of his most graceful male and female figures dressed and grouped with that delicious artistic artificiality that forms the very essence of the painter's Louis Quatorze style, with its charm of sentiment and exquisitely contrasted and harmonising colour. To those even who know foreign collections well, the Dulwich Gallery reserves in this little canvas a true pleasure. Copies, and contemporary copies, are to be found scattered in many collections at home and abroad, but no eye after seeing this Watteau can ever mistake, when met again, the hand of this charming illustrator, almost director, of the coquettish *fêtes* of the French monarchy in its naughtiest days. Not even the brilliant burin of Scotin could render the tone of this most happy of the creations of the painter who, if he had not like the former passed many years in London, we must never forget was a guest for some short time of art-loving Dr. Mead, in his old house in Great Ormond-street.

Notwithstanding the accumulated memories of great pictures and great masters that most of us as we advance in life have now the opportunity of looking back to, the famous Murillos at Dulwich hold precisely the great reputation that they have long possessed, and we look upon them still, after seeing many other Murillos, with the admiration that the work of all great masters seems to secure throughout all changes of fashion or advance of information.

Among the very representative collection of Dutch masters, the admirers of their characteristic art have always found at Dulwich a broad field for study, and though acquaintance with the Continent, and particularly the land of their origin and the wonderful collections it contains of pictures by its painters, affords much startling and pleasant instruction, the Dulwich Gallery cannot be said to cease to offer interest to the lover of Dutch art. One picture, labelled Gerard Dow, a well-known work, is, undoubtedly, in our estimation, not the work of that artist; the catalogue, it is true, expresses a doubt, and suggests the possibility of the painter being the one we should name, and we are almost confirmed in our belief by recognising the lineaments treated in the same broad manner, very unlike Dow's, of the old woman who served as the model in the equally famous picture by Nicholas Maes which hangs in the La Caze collection at the Louvre.

Dulwich Gallery has long shown its portrait by Reynolds of Mrs. Siddons, the familiar portrait in the grandiose action which tradition states was the result of a happy accidental pose of the painter's statuesque model; but among the many replicas of this familiar representation of the great actress the Dulwich copy cannot be said to stand high; if it be by Sir Joshua, it is not a good Sir Joshua, and only in the distance as one enters the gallery does it hold out a promise that a nearer inspection undeceives. In their life-like portraits by Gainsborough, beautiful Mrs. Sheridan and her equally fascinating sister, Mrs. Tickell, beam with all the lady-like animation that the painter ever knew how to breathe into the portraits of his sitters; he was in this case fortunate, indeed, in two such charming models as the Misses Linley, who, till they changed their names, turned the heads of the whole of fashion-haunted Bath of a century ago. Lucky, witty Sheridan romantically bore off the elder of the old Bath musician's daughters,—the original, by the way, of Sir Joshua's "St. Cecilia,"*—and Tickell carried off the younger, and here the two sisters sit and smile, as we hope they will sit and smile for many a generation yet, to tell us what the poet-sung "toasts" of Bath were like in the old coaching days of George III.

In interesting portraits the Dulwich Gallery is indeed by no means deficient,—portraits that each tell, as portraits ever do, their story; few, however, are more worthy attention than the portrait of Molière, "in the school of Lebrun," the new catalogue tells us; it was formerly ascribed (we know not why) to Carlo Maratti, but if of the authorship of the work sage doubts may exist, of the fact that here we have a real portrait of the French Shakspeare there cannot be a suspicion; they are the same unmistakeable features, though a trace younger, as in the famous portrait by Mignard,—the crowned Molière, *bâton* in hand, a portrait which smiles down from the walls of the actor's *foyer* at the Théâtre Français, in company with many another portrayed representation of the great men that have built up the renown of that world-famed theatre. It is one of the justly-prized treasures of the interesting, and to English visitors to Paris almost unknown, museum possessed by the theatre which in French theatrical annals bears the title of "the house of Molière."

Near this portrait of Molière hangs another theatrical portrait, if not of equal interest to the world, at least so to the English visitor, and above all to the Dulwich Gallery,—the portrait of John Philip Kemble, by Sir William Beechey, a painter who, although he appears in our memory to belong to the last century, lived an honoured life in this, and died at an advanced age as late as 1839. This John Philip Kemble is very different to Lawrence's portrait of him as *Hamlet*, which may be seen at Windsor.

The Dulwich Gallery possesses many other interesting historical portraits. Vandyck, or Van Dijck, as Dr. Richter more correctly names him, is represented, though not by any superlative work,—portraits mostly, however, of contemporaries and friends of old Desenfans and Sir Francis Bourgeois, whose names should, in the memory of every visitor to Dulwich, be associated honourably together whenever his thoughts revert to old Alleyn's "God's Gift" College at still happily countrified Dulwich.

* It has a strange effect to the rare English art-students who may find themselves in New York, to come upon in the United States an important picture by Reynolds, but such is the case in the instance of the "St. Cecilia," a picture purchased by Mr. Lenox at the instigation of the late C. R. Leslie, R.A. The picture now in the Lenox Gallery at New York is the "St. Cecilia" for which Mrs. Sheridan sat. It was one of Sir Joshua's unfortunate experiments.

WESTMINSTER ABBEY, JULY 25, 1881.

WESTMINSTER ABBEY lends itself easily to solemn occasions. Within the last very nearly a thousand years, thirty-six coronations have taken place upon its site, but we cannot hastily venture to state the number of memorable funerals that have added to the great history and the dignity of the famous Abbey. It is time, nevertheless, that other steps were taken in this respect.

Westminster Abbey, St. Mark's Venice, the Colosseum, St. Peter's, and the great Pyramid, three Christian and two pagan works, are probably the five most famous buildings in the whole world; but, notwithstanding the greater antiquity of some of them, Westminster Abbey at this moment holds a more prominent place in the regard of the intellectual world than the older buildings. Never, in the long years that have passed since Westminster Abbey has served the great purpose for which it was conceived and erected, never have the custodians of the sad paraphernalia of its funeral ceremonies, been called upon in the exercise of their duty to express or suppress more their heartfelt sorrow than on the occasion of Monday last, when Dean Stanley was buried. Never, probably, has ceremonial been associated with a wider feeling of grief, and never, perhaps, have the funeral obsequies of an eminent man taken place with so few indifferent witnesses, or so many experiencing a personal interest.

We observed a touching incident as we left the crowded Abbey on Monday last,—a poor working-man, waiting outside with a memorial wreath,—a home-made memorial wreath. He was probably a prizeholder in the late window-gardening contest at the *fête* of which the Dean was, perhaps, seen for the last time by the poor of Westminster,—ready when the great folks had passed on to add his mite to the load of honour.

Apart from the many thoughts suggested by the deathbed of the lamented Dean, his last words, as we find them quoted in the sermon delivered on Sunday last at Westminster Abbey by Canon Farrar, are singularly characteristic of the devoted interest that Dean Stanley throughout his years of connexion with the Abbey took in that hallowed spot:—"The end is come," he said, "and it has come in the way I was desirous it should come. I could not have wished it better. I took to my bed just where I wished to die, at Westminster. I am perfectly happy, perfectly satisfied, and I have no misgivings. In spite of every incompetence, I yet humbly trust that I have before the mind of the nation shown the extraordinary value of the Abbey as a religious, liberal, and national institution."

COMPETITIONS.

Bagshot Church.—Complaints and inquiries have reached us as to the management of this competition. The writers say that "in November last the committee advertised for designs, a short time only being allowed architects to prepare their drawings. Notwithstanding, however, the anxiety displayed by the committee to get possession of the designs, seven months elapsed before the unsuccessful competitors had them returned." No information as to the result was given, and they wish to know, naturally enough, whose design has been selected.

Birmingham and Midland Eye Hospital.—An adjourned meeting of the committee of this institution was held on Friday, the 22nd inst., for the purpose of selecting a design for the reconstruction of the hospital. Six sets of drawings had been submitted by the invited competitors. Those under the motto "Mens tuus ego" received the highest number of votes, and the authors, Messrs. Payne & Talbot, of Birmingham, were appointed to carry out the work.

The Royal Exchange. — The Gresham Committee have expressed their willingness to accede to the wishes of merchants, bankers, and others who lately memorialised them on the desirability of covering the Royal Exchange with a glass roof.—*City Press.*

THE TUNNEL AND INSCRIPTION AT SILOAM, JERUSALEM.

THE Committee of the Palestine Exploration Fund are taking much pains to bring before scholars in this country the best materials for forming a judgment as to the rock-cut inscription to which we referred* as discovered in June, 1880, at the Pool of Siloam. In the recent "Quarterly Statement" are given a transcript of this inscription, an alphabet of Aramaic characters, and articles on the subject by the Rev. A. H. Sayce and the Rev. Isaac Taylor. The *Athenæum* of the 16th July contains a letter on the same subject from Mr. Shapira, who has had the advantage over the English scholars of being able to study both the inscription itself and the German cast of the tablet, made by Dr. Gutke, and who, being himself a Jew, and familiar with Aramaic as well as with Hebrew, is likely to feel more thoroughly at home in the matter then even the most learned English scholars.

The comparison, however, of the translations of Mr. Sayce and of Mr. Shapira only tends to confirm us in the wisdom of waiting for fuller light on the subject. We hope that it may prove possible to photograph the tablet by the magnesium light, and that from the cast already taken, the photograph, and the rock itself, the text may at length be accurately determined. At present this cannot be said to be the case. The courtesy of the secretary to the Fund furnished us, some time ago, with a tracing of the first sketch of the inscription that was sent to England. After giving some little time to the study we came to the conclusion that it was necessary to wait for further information. Nor can it be doubted that this was right. The first word in the tracing is "Dereh." The first word in the new copy of the inscription is "Nekebeh." Mr. Sayce commences his translation, "Behold the excavation. Now this is the further side (or the history) of the tunnel." For this Mr. Shapira writes, "Canal of (U) zziah. He dug the canal and cut the pool (or it is the pool) in Ophe (l)."

It is not very encouraging for the unlearned reader, apt, it may be, to have his doubts as to the "science of epigraphy," to contrast these two renderings of some twenty to thirty letters. Contrary to what might have been expected, it is the translation of Mr. Shapira which makes both the best English and the best sense. On the other hand, this translator seems to have a strong disposition to read what is not to be found in the letters. Thus, of the name Uzziah the most characteristic letter is wanting; and so is the *l* of ophel, which Mr. Sayce reads "olu." We certainly hold with Mr. Neubauer, in the *Athenæum* of the 23rd of July, that it is premature to discuss the various readings until the text be definitely settled.

Equally imperfect, we hold, must be any attempt as yet to fix the date of the inscription on palæographic grounds. Mr. Sayce argues for a date of extreme antiquity, in fact, as far back as the reign of Solomon, from the archaic form of some of the letters. But it is admitted that two forms of the same letter occur in the cases of the *aleph*, the *mem*, the *vau*, and the *resh*. Mr. Isaac Taylor, in the "Quarterly Statement," argues reasonably that it is the latest, not the earliest, form of letter occurring in any inscription that should determine its greatest age. One character, which Mr. Neubauer proposes to read as *zain*, is not to be found either on the Moabite stone, on any Hebrew coin, or in the alphabets collected by Gesenius, Mr. Madden, Messrs. Conder's "Handbook to the Bible," or the valuable book, called "Grammatography." It more closely resembles the Hieratic *cheth* (of Ballhorn) than any other character with which we are acquainted. It will be interesting to know on what grounds it is identified, and what light such identification throws on the date of the character. Mr. Shapira, who has studied both the inscription and the cast, says that "we actually find the strangest forms of letters and ligatures, and one letter in different forms." Mr. Neubauer, who has not seen either inscription or cast, "cautions" his readers "against any idea of ligatures between the letters in the Siloam inscription." This question is not, however, one of opinion, but one of fact; and, of course, eye-witness goes for more than assumption. It should not be forgotten that the Aramaic alphabet is one which has not only preserved its type for an immense period of time, but in which early and apparently long disused forms have reappeared at a certainly determined and later date. Thus the letter *shin* has two types,—one that of the small Greek *omega*, the other that of the capital Roman W. The first occurs on the Sidon inscriptions, about B.C. 800, then, slightly altered on some of the coins of about B.C. 277; and then on the Roman *denarii*, re-struck with Jewish types, as late as A.D. 130. The W form occurs on the Diban stone, and again on the coins. We have as yet no minimum date fixed for the use of Aramaic letters, and if ligatures exist on this inscription, it may be better evidence for a later date than any which exists for the era of Solomon, which was a long time ago.

As to the little drift-way itself, it is not a work of such skill as to render it desirable to commemorate the name of the engineer. The position will be seen, by a reference to the map No. 7 in Conder's "Handbook to the Bible," (p. 335) to tally with the work which was executed by Hezekiah (B.C. 717–688). If Mr. Sayce be correct in saying that the length underground is 1,708 ft, although the straight line above is only 1,101 ft., there would seem either to have been much want of skill in the construction, or otherwise that the conduit formed part of a more general plan, of which we have only recovered this portion. Thus, on any ground, it is desirable to investigate the matter fully.

The "Quarterly Statement" which contains the letter from Mr. Sayce and Mr. Taylor is one of unusual interest. We cannot attempt to give an abstract of its contents,—not that it would do any injustice to the work itself, for it would only make the reader more anxious to study the actual report,—but for want of space. Lieutenant Conder's discovery of the Hittite capital, Kadesh, on the Orontes, known from Egyptian records to be older than the Exodus, has excited extraordinary interest. We hope that funds will be forthcoming in order to ascertain whether the library of the Hittite kings may not prove as enduring as those of the kings of Nineveh and of Babylon. The interest in the Holy Land and its vicinity seems to have been stimulated rather than satisfied by the completion of the great map, and the work carried on under the direction of the committee needs only to be widely known in order to insure any requisite amount of pecuniary support. We commend to all our readers the Quarterly Statement of the Palestine Exploration Fund, for July, 1881.

* See *Builder* of April 9, 1881, p. 458.

NEW DOCK AT LEITH.

WHATEVER may be the attractions that give splendour to the occasion of its opening, the new dock at Leith has an intrinsic importance which needs but little knowledge of the case to realise. The basin which will have been opened by the time that these pages are in the hands of our readers, is the second and the larger of two new docks erected on land reclaimed from the sea. The Albert Dock, covering 10¾ acres, was completed in 1869. The Edinburgh Dock, connected with the Albert by a passage crossed by a heavy stone bridge, covers 16½ acres. It is 1,500 ft. long, and 650 ft. wide, but its wharfage, or waterside accommodation, is far more in proportion to its wet area than in other cases. A jetty 1,000 ft. long, and 250 ft. wide, projects into the dock from the eastern end, and the form thus given being something like that of the capital letter H, adds a linear measurement of 2,250 ft. or upwards to the length of wharfage. At the west end of the jetty, within the limits of length and breadth mentioned, is a graving dock 300 ft. long. This is a smaller graving dock than that called after the name of H.R.H. the Prince of Wales in connexion with the Albert Dock, which is 470 ft. long; but it will be an immense convenience for any vessel which, having entered the Edinburgh Dock, has need of the service of a graving dock before putting to sea.

The Edinburgh Dock makes the fifth of the wet docks now in connexion with the port of Leith, two of which are on the west and two on the east side of the harbour. Of these the first, known as the Old Dock, was opened in 1806, so that we have in the present area the measure of the growth of three-fourths of a century. How far the trade has expanded in that time there is a want of statistics to show. Since 1840 the total dues received by the dockyard commissioners have risen from 26,012*l.* to 88,330*l.* per annum. Since 1860 the outward tonnage has risen from 483,748 tons to 945,230 tons, and the inward tonnage from 477,400 tons to 910,200 tons. The actual number of vessels entering the port shows a decrease, but this is due to the increased burden of each vessel, and shows very clearly the great advance that has been made within the last twenty years in the size of our mercantile vessels.

The northern side of the new dock is to be devoted to the colliery traffic, which it is hoped may thus receive a new impetus. The chief exports from Leith at the present time are coal and iron. In both of these, however, the last five years show a notable decline. In 1874-5, 296,193 tons of coal, 147,329 tons of pig-iron, and 1,563 tons of malleable iron, were exported. In 1879-80 the weights had fallen to 185,175 tons of coal, 127,207 tons of pig iron, and 1,821 tons of malleable iron. This is the lowest amount of pig-iron for any year of the five. As to coals, 20,000 tons less were exported in 1878-9 than last year, and the malleable iron was also some 700 tons less. There is thus a small increase in these two items as contrasted with the preceding year, but the decline in the staple export of pig-iron has been steady for the whole period, amounting to nearly 40 per cent. between 1874-5 and 1879-80. Grain, the chief import, has increased, although not steadily. In 1875-6 the imports were 1,074,124 quarters; in 1879-80 1,135,127 quarters. In 1878-9 they were only 939,033 quarters. Most of the coal goes to Russia, and the iron to Germany. In face of this declining trade, the spirit shown by the opening of the new dock is the more striking.

GAS EXPLOSION AT CHALK FARM BRIDGE.

THE account which has been given in the daily press of the circumstances and the cause of the gas explosion at Chalk Farm Bridge, on the morning of the 20th of July, is so incredible, that in reproducing it we must do so under reserve, not having had the opportunity of personal verification. It is stated that in the construction of the bridge hollow box girders were introduced between the roadway and the foot pavements, and that "in spite of the protests made against the proceeding at the time of the construction of the bridge, the gas company, instead of running their pipes under the bridge, or through the hollow girders, made use of one of the latter as a portion of the circuit, turning the gas into it at one end, and drawing it out at the other." It is not stated in the account what gas company it is that adopted so fatal an economy. On reference to the map, it will be seen that the district referred to is that of the Imperial Gas Company, the second in order of magnitude in 1874, and subsequently, if we are not in error, incorporated with the Chartered or Gas Light and Coke Company, the eldest of these bodies, which was incorporated by Act of Parliament in 1810. The public will thus have naturally concluded that every precaution known to science was taken by the engineer of the gasworks. Nor is it conceivable how the engineer of the Regent's Canal, or the officer, whoever he was, that was responsible for the construction of the bridge over the canal, would have allowed a portion of the structure to be turned into a gasholder. In a word, the *pros* are so few, and the *cons* so numerous and weighty, that we write in the full expectation that the detailed statement of the morning journals will be contradicted by the supposed offenders.

But even assuming that a pipe was laid through the girder, the public safety would by no means have been secured, unless there had been a manhole or other means of visiting, testing, and, if necessary, repairing or replacing the pipe. Gas is, to some extent, corrosive in its action, and after a time makes pinholes in, at all events, a certain class of gas-pipes. Again, joints are apt to leak, and when iron is laid on iron, the jar of passing traffic may easily have an accumulative and destructive effect. Any way, it seems that the box-girder was filled with that explosive mixture of coal-gas and atmospheric air, which is so well known to be easily formed if gas is allowed to escape into a closed chamber. As to the exact facts of the occurrence, there seems little room for doubt. The witness and unintentional cause of the explosion, though blown across the road by its force, is said to be, happily, uninjured. This was the lamplighter, who, while cleaning the lamps on the northern pier of the western girder, suddenly perceived a strong smell of gas.

Suspecting a leakage, he proceeded to show that his employers have not taken our advice as to furnishing their servants with a grammar of danger, or a short, clear, explicit set of rules, telling the men what to do and what to avoid in each particular case. Uninstructed on this vital point, the lamplighter proceeded to see whether the mixture was or was not explosive by the simple mode of experiment. Explosive it turned out to be, and before the experimenter could say, "Ha! I thought so," "a terrific series of explosions took place." Happily for those who would otherwise have been the sufferers, the explosion occurred at so early an hour that no one was passing over the bridge. Half an hour later large numbers of workmen would have been passing to their labour. But while this is matter for unfeigned congratulation, as far as the safety of the moment is concerned, it is not so clear that the harmlessness of the occurrence is conducive to the public safety on a broad scale. Had any fatal injury been occasioned,—and it is no thanks to the lamplighter's mode of looking for a leak that it was not,—there would have been an inquest. At such an inquiry it is probable that something rather memorable would have been said as to the plan of turning bridges into gasholders; and at least another opportunity would have been afforded of impressing on those concerned that it is just as prudent to *test* the leakage of a gas-main by the use of a naked light as it is to try whether gunpowder is dry by the application of a bit of red-hot iron. As it is, it is left to us and to a few fellow-labourers to do what we can to call attention to the fact. Meanwhile gasmen will continue to search for leaks with lighted candles until a sufficient number of explosions have thus been caused to impress the explosive nature of gas on the minds of those who deal with it.

From the report of the proceedings of the St. Pancras Board of Works on the 21st July, it appears that the girder was actually used as a gas-pipe. An agreement was produced, which recited that the gas company were to keep the girders in proper repair and gas-tight, and that in the event of failure to do this, the Vestry had the power to put an end to the concession. On the face of this, it would seem that the combination of girder and gas-pipe is a bit of vestry engineering. It will be interesting to know who originated so novel a design, and what are the arguments by which its introduction was supported. The excitement in the neighbourhood, not unnaturally, was reported to be intense, and there is a strong feeling against the continuance of so dangerous a practice. The parish solicitor was consulted. We apprehend that there can be little doubt that the new mode of gas-fitting has received a signal discouragement; still, we are anxious to know who were the authors of the design.

THE TUNNEL UNDER THE MERSEY.

EVEN if ousted, by the marvellous growth of Glasgow, from its former proud position of the second city in Great Britain, Liverpool, in virtue of its 550,000 inhabitants, is still the second city in England. In enterprise and public spirit, moreover, Liverpool has long been held entitled to the boast *nulli secundus*. And as an organised body, or group of bodies, the Town Council and various public authorities of Liverpool have probably more efficiency and intelligence than any other urban authorities in the country, bearing in mind the dislocation existing between city and metropolitan jurisdiction in London, to say nothing of the Conservators of the Thames, the City Commissioners of Sewers, and the various vestries.

Powerful and energetic as Liverpool is, however, it has long been content to be bisected in a very inconvenient mode. In fine weather the trip across the Mersey is not much of an inconvenience, and, indeed, the whiff of salt water thus caught may be welcome to many a hard-driven business man. But weather is not always fine. Days are short in winter. And a steam-ferry over such a river as the Mersey is at times anything but a business-like mode of connecting the docks on either side of the river. What would London say, if some fine morning she should find that her bridges had been replaced in the night by steam-ferries? And the crossing of the Thames is nothing to the crossing of the Mersey.

It is thus remarkable that, although as far back as 1848 proposals were made for a tunnel under the Mersey, it is not until the present time that Liverpool has seriously taken in hand the completion of her organic unity. An agreement has now been entered into by the Mersey Railway Company with the London and North-Western Railway Company for the construction of a line of two miles and a half long that will pass under the Mersey. From a junction with the Birkenhead Joint Railway at Tranmere, the line will run through Birkenhead and under the Mersey, and terminate in Church-street, Liverpool, near the central station of the Midland, Great Northern, and Manchester, Sheffield, and Lincolnshire Railways. That portion which passes under the bed of the Mersey will be about a mile in length, and as far as can be ascertained from a careful series of borings, will be carried through the New Red Sandstone, leaving a sufficient thickness of 25 ft. of rock between the crown of the tunnel and the bed of the river. The works have been contracted for at the sum of 866,000*l.*, of which 216,000*l.* is to be borrowed on debentures. The gross annual receipts are estimated at 140,000*l.* and allowing fifty per cent. for working expenses, the estimated dividend is at the rate of nine per cent. on the share capital of 650,000*l.*

It is estimated that 26,000,000 passengers and 500,000 tons of goods, are annually passed to and fro between Liverpool and Birkenhead. The company have taken credit for half the number of passengers at 2d. each, for the whole quantity of goods at 1s. per ton, and for the modest sum of 6,000*l.* per annum for parcels and sundries. The nearest railway connexion at present is by Runcorn, a distance of thirty miles. We note that while the preliminary report of the census gives to Liverpool 550,000 inhabitants, the account of the railway project gives 681,936 as the population of Liverpool, and 82,216 as that of Birkenhead. We also observe that the *interim* report on the Scotch census only rates Glasgow at 511,582 inhabitants, instead of the 740,000 claimed for that port a few days ago in the newspapers. We must leave the respective authorities to settle this rather serious difference between them.

THE SPANISH ACADEMY OF FINE ARTS, ROME.

ON the 22nd of May, 1875, there arrived at Rome Count Coello, the Spanish representative to Italy, who, having withdrawn himself for some years from diplomatic service on account of a great misfortune, after hesitating for some months before he returned to that career, was led to take that step by his old and proved loyalty to the Spanish royal house, the grateful recollections of a long residence at Turin, and his friendship with Count Cavour and the principal political men of Italy. These recollections, however, were the more necessary in order to fortify himself in the task he was about to undertake, which was of no easy accomplishment, as it was intended to establish important relations between Spain and Italy. The Government of Victor Emmanuel, actuated by a noble sentiment, had been one of the first in Europe to recognise the monarchy of Alfonso XII., although the wound which had been inflicted on Italian pride, and naturally on the royal family of Savoy, but which had been caused by events in which the Alfonso party had had no hand, was still fresh.

On the morning of the 24th May, when Count Coello had scarcely presented his credentials to King Victor Emmanuel, there appeared before him the aged superior of the Society of the Franciscan Order of San Pedro in Montorio, Father Jeremias, informing him that, on the following day, the agents of the commission of church property of the province of Rome were about to take possession of that old church and monastery, which had been appropriated by the Italian government under the law dealing with ecclesiastical property, and urging him to prevent its sale, on account of its intimate connexion with the Spanish monarchy, as shown by the presence on its walls of the arms of the royal Spanish house of Austria, which fact might be used against the proposed disposal, as demonstrating the original ownership of the building. Moreover, there was found at the door of the small church of Bramante a record of the vow made by the Catholic kings who had erected that temple, another incident which supplied strong evidence as to proprietary rights. Count Coello used his influence with the Italian ministry of the day, in so far as to obtain a delay in the sale of the old monastery, and a respite was thus gained for establishing the ownership. The church of Bramante had ever been prized as the site where St. Peter was crucified; and it possessed, besides, great historic value in the eyes of Spain, as being the temple built by the Roman Catholic kings in fulfilment of a supposed vow to erect a church to St. Peter if the Lord would grant a male child to the Spanish royal family, a child who was subsequently born, and who was Prince Don Juan. The walls are covered with the shield of Isabel and Fernando, and the coat of arms of Felipe II. and Carlos V., which occur about fifty times. A diligent search made in archives and old registers by Señor Don Francisco Aguado, the secretary and archivist of Spanish ecclesiastical buildings, showed on what grounds Pope Sixtus IV., in 1472, had granted, at the solicitation of the Catholic kings, to Father Amadeo the site, much more extensive at that time, upon which the edifice of San Pedro in Montorio is raised. The deed still exists by virtue of which Ferdinand the Catholic, yielding to the prayers of Isabella, who was desirous of a male child, fulfilled the vow made by him by supplying funds for erecting not only the church but also the small edifice of Bramante. The inquiries pursued by Señor Aguado also testified to the struggles which the Spanish monastery from its origin had maintained with those of San Pancracio and San Clemente and the Cistercian Order. Many other documents had also to be studied, all of which proved, however, the perfect right of the Spanish crown to the buildings and the site.

The diplomatic negotiations which followed upon the establishment of the Spanish crown as the owner were for a time interrupted in 1876 by the fall of the Conservative ministry; and when the Depretis ministry succeeded it, a satisfactory treaty was arranged, under which the rights of Spain were recognised, while the susceptibilities of the Italian Parliament were reconciled by the proposition of rearing an Academy of Fine Arts for Spanish students on the ruins, the small edifice of Bramante alone being reserved for a Spanish monastery, in which the holding of religious service is to be permitted for ever. We give a view of the new Academy.

MUSEUM, FREE LIBRARY, AND SCHOOL OF ART, STAFFORD.

IN our present issue we give an engraving of the above building erected by the Corporation of Stafford, from designs by Mr. J. B. McCallum, the borough surveyor. The building covers an area of about 225 square yards. The library and reading-room occupy the ground-floor, the first floor being taken up by the "Wragge" Museum, leaving the second floor for the Art and Science Schools. The building is situated in Eastgate-street, and adjoins the Borough Hall, which provides for the entrance, and is connected on the ground and first floor.

The frontage is composed of red brick, with ornamental designs in terra-cotta, supplied from the Brereton Works of Mr. Arthur Gee, of Stafford, the contractor. The work, which includes some scrolls and medallions in terra-cotta, has been completed by Mr. A. Gee, at a cost, exclusive of the site, of 2,000*l.* The heating apparatus was supplied by the Birmingham Sanitary Association.

CONGREGATIONAL CHURCH SUNDAY SCHOOLS, BROUGHTON PARK.

THE new Sunday School is being erected at the entrance to Broughton Park from the Bury Old-road, Manchester, and is designed for 300 scholars.

The large room is 55 ft. long by 28 ft. wide, and 30 ft. high to the ceiling. The whole of the rooms will be heated by low-pressure pipes. A heating chamber, a kitchen, and the other offices are provided in the basement.

The building, which is of late Gothic character, is faced with Kerridge parpoints, and dressings of Alderley stone.

The work is being carried out by Messrs. W. Southern & Sons, Salford, from the designs of Mr. A. H. Davies-Colley, architect, Manchester.

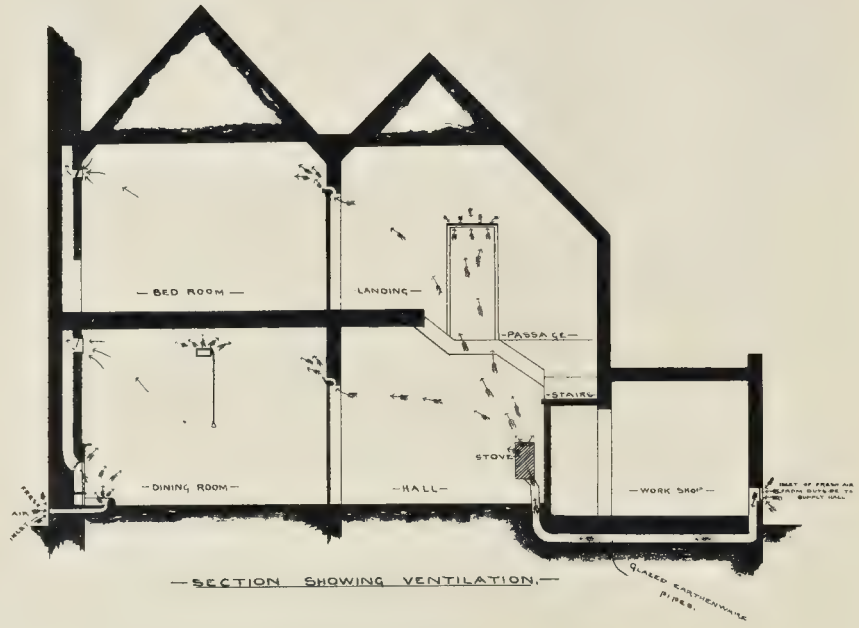
The Salters' Company.—Mr. Henry Dawson, F.R.I.B.A., is the successful candidate for the surveyorship of the Salters' Company, in succession to Mr. John Collier, deceased. The election took place on the 21st inst.





THE SPANISH ACADEMY OF FINE ARTS, ROME.

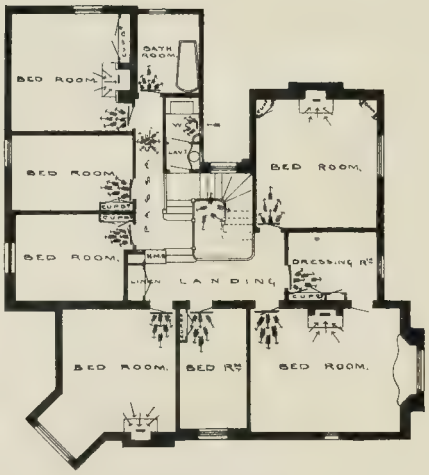




— SECTION SHOWING VENTILATION. —



— GROUND PLAN. —



— FIRST FLOOR PLAN —

SHOWS FRESH AIR INLETS.

SHOWS VITIATED AIR OUTLETS.

SCALE TO PLANS

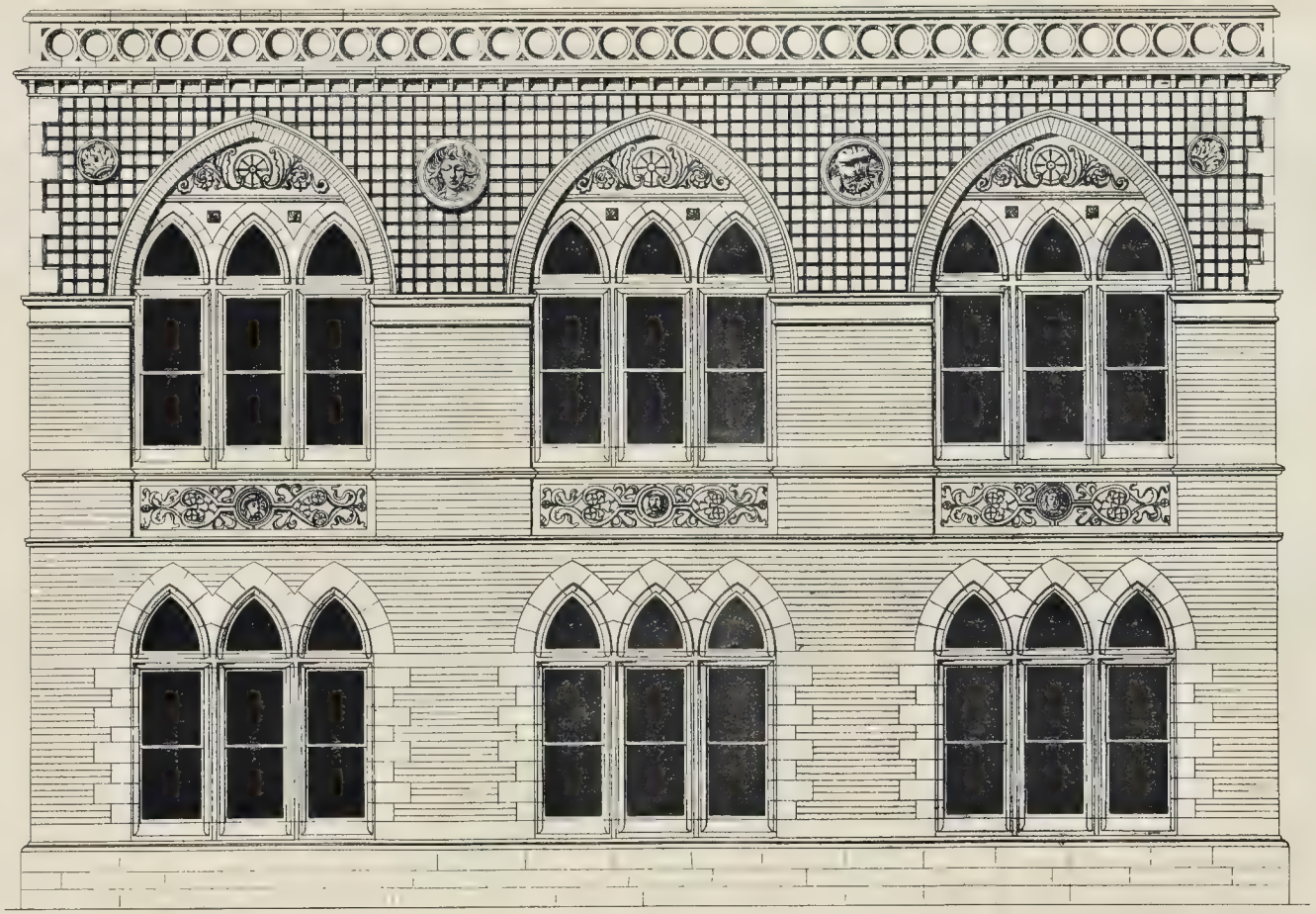
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— FAIR-OAKS — ADDLESTONE — SURREY — HENRY G. BRACE — A.R.I.B.A. — ARCHITECT —

Whiteman & Bass *Photo litho* 236 High Holborn

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MUSEUM, FREE LIBRARY, AND SCHOOL OF ART, STAFFORD.—Mr. J. B. M'Callum, Architect.

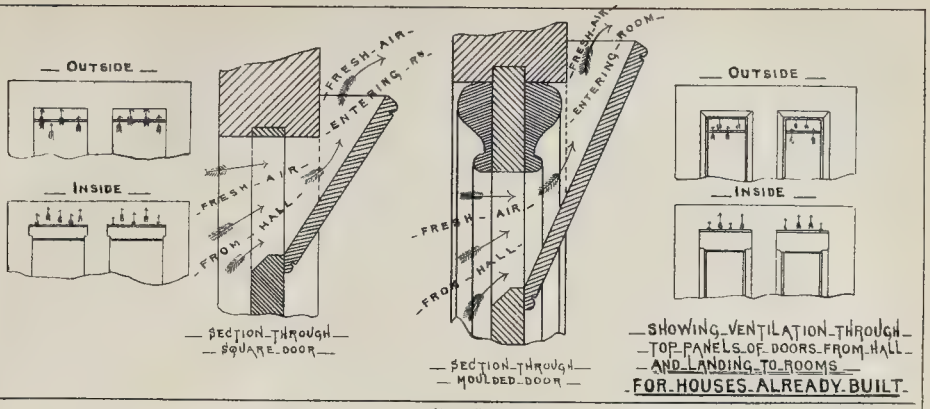
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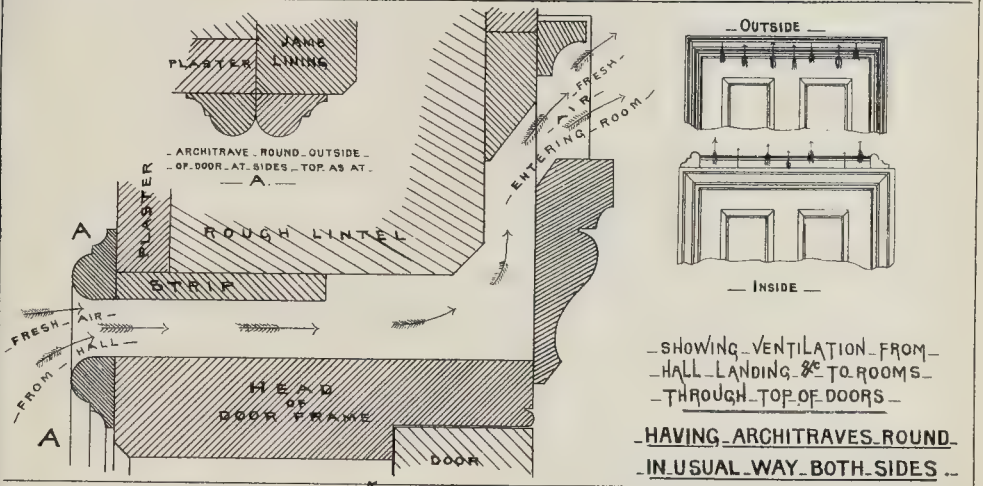
CONGREGATIONAL CHURCH SUNDAY SCHOOLS, BROUGHTON PARK, MANCHESTER.——Mr. A. H. Davies-Colley, Architect.

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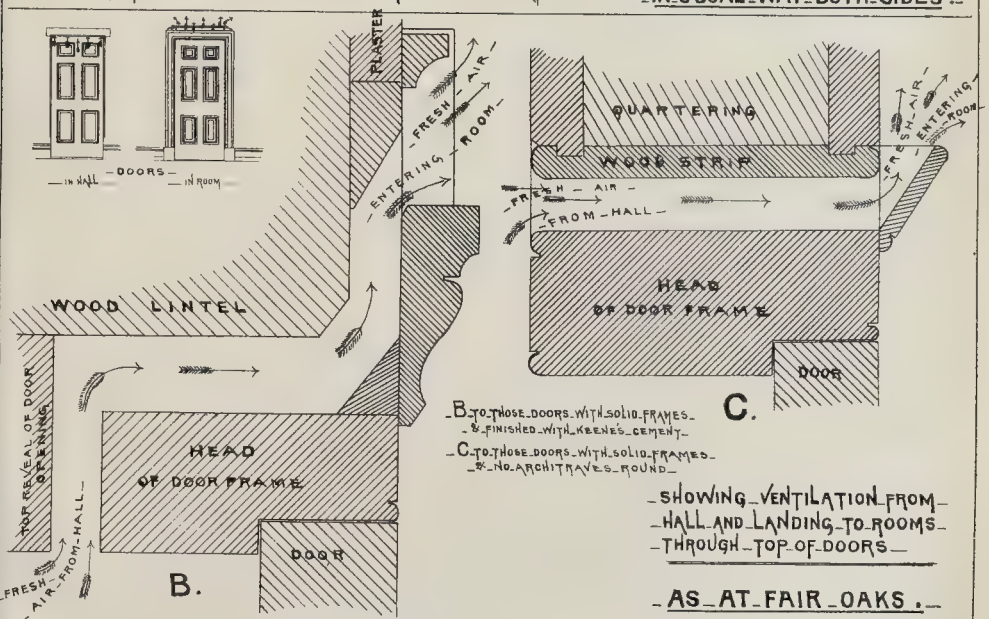
SHOWING VENTILATION THROUGH TOP PANELS OF DOORS FROM HALL AND LANDING TO ROOMS

FOR HOUSES ALREADY BUILT



SHOWING VENTILATION FROM HALL LANDING &c TO ROOMS THROUGH TOP OF DOORS

HAVING ARCHITRAVES ROUND IN USUAL WAY BOTH SIDES



B. TO THOSE DOORS WITH SOLID FRAMES & FINISHED WITH KEENES CEMENT

C. TO THOSE DOORS WITH SOLID FRAMES & NO ARCHITRAVES ROUND

SHOWING VENTILATION FROM HALL AND LANDING TO ROOMS THROUGH TOP OF DOORS

AS AT FAIR OAKS.

SYSTEM OF VENTILATION INTRODUCED BY HENRY G. BRACE A.R.I.B.A. ARCHITECT.

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FAIR OAKS, ADDLESTONE.

ORDINARY VENTILATION.

THE small country-house at Addlestone, Surrey, of which we now give plans and details of ventilation, was built for Mr. John Crowdy (the editor of the *Artist*), from the designs of Mr. Henry G. Brace, 22, Chancery-lane, and embodies points to which both architect and owner have given special attention in connexion with middle-class house architecture.

It exemplifies in plan, as a leading idea, the grouping of the principal rooms round a square hall, which is made an effective internal feature. The staircase is taken into a recess, and treated with a desirable prominence not usual in small houses. Another point is the giving private access to the dining-room from the kitchen department, by a second or serving door.

In the drawing-room is the music recess, by which provision is made for a grand piano and its player. This was a stipulation, we believe, of the owner, and the architect has used it as an opportunity for a pretty effect.

Ventilation is obtained by the cutting of slits in the top of the door-frame, slanting upwards toward the ceiling of the room. These open, in nearly every case, from the hall (a stove in the hall will, when desirable, take the chill off the air), for the supply of every room in the house with fresh air; that is not direct from the outside. The openings are always working, cost but little, and improve the appearance of the top of the door-openings. The reception-rooms are also provided with direct external supply, through Sherringham's ventilator. The vitiated air is drawn into the smoke-flue through a Boyle's ventilator.

It is understood that the currents through the upward slanting slits over the doors result in no draught perceptible to those in the rooms, as the currents entering but at little more than half-way up the height of the rooms and of the width of the door-openings are gently broken up, the air finding its level with the minimum of disturbance.

The external elevation is in red brick, with a very sparing use of stone, and the roofs are of red tiles, while the treatment or style aims at securing a picturesque effect by frankly using modern materials. In the interior much is made in a simple way of the woodwork, especially in and about the hall, staircase, bath-room, and vestibule.

Round the dining-room is a border of tiles; while round the drawing-room and in the bays is parquet-flooring. The morning-room has a wood dado round it, and the floor is of oak. The hall and vestibule are paved with mosaic.

The wall decoration and painting are unobtrusive, but in modern spirit. A treatment of the drawing-room walls and woodwork in two shades of lemon has turned out successful.

SAVAGE ARCHITECTURE.

IN nothing does the savage figure so dimly in an intellectual light as when considered as an architect. Not only is he, in this respect, widely inferior to the civilised man of the lowest grade, but even the beasts of the field, the birds of the air, even flying and creeping insects, seem, in many instances, entitled to claim of him precedence as house-builders. Take the case of the Bushmen of Australia, the Chinook of North America, the stalwart Patagonian, or his opposite neighbour, the elfish Fuegian, and contrast their various abodes with those of the ant, the bee, the beaver, the little harvest-mouse, the magpie, the tailor-bird, the bottle-tit, and a dozen others. Take the magpie's nest, bristling without with such an array of spears and spines that the cunningest of the host of larking and prowling beasts of prey shall pass it by and make no attempt, or assailing it go whining off with a lacerated nose; but while its outside is so impregnable, the most luxurious baby-basket that riches can procure is less cosy and comfortable within; set this by no means excellent specimen of bird architecture side by side with the filthy hole, swarming with vermin, steaming with pestilential exhalations, with no other inlet for fresh air and sunlight than such a doorway as would discredit a rabbit-warren, and with no more durable roof than one composed of green boughs sluttishly arranged. Set the house of the harvest-mouse, round as a ball, and seemingly as solid, but, nevertheless, with snug interior accommodation for half-a-dozen little blind mice,—though whether the house was first built and the baby mice afterwards thrust in, or the tiny things suspended in the air and the house built round them, no naturalist has yet been found daring enough to give a positive opinion, — nobody knows even how mother-mouse gets at her progeny to feed them, as they hang between the solid walls of their spherical mansion to a pliant corn-stalk. Compare this marvel of mechanism with the lairs,—houses they cannot be called,—a mere handful of saplings stuck into the ground in a circle and tied together at the top, and festooned with reeds, and boughs, and grass,—as constructed by the Fuegian and Andamaner. Compare the admirable work of the beaver with the styish abode of the New Guinea savage! The result of contrast in each case will give rise to feelings, not only of profound humiliation, but also of wonder. How is it that the Bushman, with mechanical skill enough to make him spears and bows and arrows, and invention enough to discover and prepare animal and vegetable poisons with which to tip the latter, making a mere scratch with the tiny thing as certain a forerunner of death as a surely-aimed bullet,—how is it that he does not provide himself and his family with at least a warm and dry place of abode? Truly, he has no conception of the comforts of "home," as the term is applied in civilised countries; still, he is human. "If you prick him he bleeds; if you tickle him he laughs"; and if he lies on the damp earth, with the rain trickling through his bough roof, and the wind whistling in at a hundred chinks, he catches cold, and coughs and sneezes, and becomes afflicted with rheumatism and pulmonary disease, him and his children, who drop from the tree of life like blighted apples. Why does not he alter so miserable a condition of things? Why does not he "go to the ant," or any other of God's creatures around him, and learn wisdom?

It should not be inferred, however, that all savages are as heedless of home comfort as the Bushman and the others of whom he has been taken as an example.

There are races of men who, all their works considered rightfully, bear the appellation of savages, yet have the forethought and industry to build them dwelling-places convenient as their means allow, weatherproof and comfortable, and claiming mention in these pages only that they are highly curious. Most prominent among these are the "Guaraons" of South America. Near to the mouth of the vast River Orinoco there resides a tribe of Indians known as the tribe of Guaraons. They are not a numerous people, —the most modern account numbers them at 8,000,—nor are they ever likely to be, as, from motives known only to themselves, they refrain from associating with neighbouring peoples, and have no commerce with the rest of mankind beyond a very limited trading. The Guaraon has little or no need to engage in barter; his wants are confined to wherewithal to satisfy his hunger, to shield him from the inclemency of the weather, and to enable him to float on the water for fishing purposes. All these wants are supplied by a single and wonderful tree,—the Itá palm. This marvellous vegetable production grows to the length of upwards of 100 ft., and its leaves are so large that one, together with the stalk that attaches it to the trunk, is a load for a man; very few of these leaves suffice for the walls and roof of the Guaraon's house. Besides these useful leaves, the Itá bears a prodigious quantity of apple-shaped fruit, enclosed in which is a nut which, bruised and set to ferment in water, yields a delicious beverage, exhilarating and slightly,—very slightly,—intoxicating. If, however, our savage is inclined "to give his mind to drinking," he has but to tap the trunk of the Itá, and it will yield him a wine that, drank but in moderate quantity, renders him as thoroughly "drunk and incapable" as the most inveterate civilised candidate for a station-house lodging could wish to be. Nor is the wonderful Itá yet exhausted. Its trunk is a meal-barrel as well as a wine-cask, and by splitting its trunk and preparing the pith therein contained, he has a dish that in quality nearly approaches anything that could be concocted from the best sago. Not yet even have all the qualities of this palm-tree been enumerated. To quote the words of Captain Reid,—"The trunk can be scooped out into dishes or cut into spoons, ladles, and trenchers. The flower's spathe also gives him cups and saucers. The bows and arrows which he uses are obtained from the tough sinewy petiole of the leaf; so is the harpoon-spear with which he strikes the great manatee, the porpoise, and the alligator; the canoe, light as a cork, which carries him through the intricate channels of the delta, is the hollow trunk; his nets and lines and the clothes which he wears round his loins are all plaited or woven from the young leaflets before they have expanded into the fan-like flower. Such is the Itá palm. Now for its uses,—the uses to which it is put by the Guaraon. When the Guaraon wishes to build himself a habitation, he does not begin by digging a foundation in the earth. In the spongy soil on which he stands that would be absurd. At a few inches below the surface he would reach the water; and he might dig to a vast depth without finding firm ground. But he has no idea of laying a foundation upon the ground, or of building a house there. He knows that in a few weeks the river will be rising; and would overtop his roof, however high he might make it. His foundation, therefore, instead of being laid in the ground, is placed far above it,—just so far that when the inundation is at its height the floor of his dwelling will be a foot or two above it. He is guided by certain marks upon the trunks of palm-trees, notches which he has himself made in the preceding year, or the natural watermark, which he is able to distinguish by certain appearances on the trees. This point once determined, he proceeds to the building of his house. A few trunks are selected, cut down, and then split into beams of sufficient length. Four fine trees, standing in a quadrangle, have already been selected to form the corner-posts. In each of these, just above the watermark, is cut a deep notch with a horizontal base to serve as a rest for the cross-beams that are to form the foundation of the structure. Into these notches the beams are hoisted, by means of ropes, and there securely tied. To reach the point where the platform is to be erected,—sometimes a very high elevation,—ladders are necessary; and these are of native manufacture,—being simply the trunk of a palm-tree, with notches cut in it for the toes of the climber. These afterwards serve as a means of ascending and descending to the surface of the water during the period of its rise and fall. The main timbers having been firmly secured in their places, cross-beams are laid upon them, the latter being either pieces of the split trunks, or, what is usually easier to obtain, the petioles of the great leaves, each of which, as already stated, forms of itself a large beam, 12 ft. in length and from 6 in. to 1 ft. in breadth. These are next secured at both ends by ropes of the palm-fibre. Next comes a layer of palm-leaves, the strong, tough leaflets serving admirably as laths to uphold the coating of mud which is laid thickly over them. The mud is obtained from below without difficulty, and in any quantity required; and when trowelled smooth and dry, which it soon becomes under the hot sun,—constitutes an excellent floor, where a fire may be kindled without danger of burning either the laths or joists underneath. As yet the Guaraon has completed only the floor of his dwelling, but that is his principal labour. He cares not for walls,—neither sides nor gables. There is no cold frosty weather to chill him in his tropical home; no snow to be kept out. The rain alone, usually falling in a vertical direction, has to be guarded against; and from this he secures himself by a second platform of lighter materials, covered with mats, which he has already woven for the purpose, and with palm leaflets, so placed as to cast off the heaviest shower. This also shelters him against the burning sun, an enemy which he dreads even more than the rain. His house is now finished; and, with the exception of the mud floor, is all of the Itá palm,—beams, cross-timbers, laths, and mats. The ropes he has obtained by stripping off the epidermis of the full-grown leaflets, and then twisting it into cordage of any thickness required. For this purpose it is equal to hemp. The mats he has made from the same material; and well does he, or rather his wife,—for this is usually the work of the females,—know how to plait and weave them.

Like other beings, the Guaraon must at times sleep. Where does he stretch his body? On the floor? On a mat? No. He has already provided himself with a more luxurious couch, —the 'rede,' or hammock, which he suspends between two trees; and in this he reclines, not only during the night, but by day, when the sun is too hot to admit of violent exertion. His wife has woven the hammock most ingeniously. She has cut off the column of young leaves that projects about the crown of the

morichi. This she has shaken, until the tender leaflets become detached from each other and fall apart. Each she now strips of its outer covering, a thin ribband-like pellicle of a pale yellow colour, which shrivels up almost like a thread. These she ties into bundles, leaving them to dry awhile; after which she spins them into strings, or, if need be, twists them into larger cords. She then places two horizontal rods or poles about 6 ft. apart, and doubles the string over them some forty or fifty times. This constitutes the woof; and the warp is obtained by cross-strings twisted or tied to each of the longitudinal ones, at intervals of 7 in. or 8 in. A strong cord, made from the epiderm's of the full-grown leaves, is now passed through the loop of all the strings, drawn together at both ends, and the poles are then pulled out. The hammock, being finished and hung up between two trees, provides the naked Indian with a couch, upon which he may repose as luxuriantly as a monarch on his bed of down."

The practice of seeking a home among the boughs, although rare, is not confined to the savages of South America. Stedman makes mention of the same thing as observed by him in Africa, as does Mr. Moffat, who, detailing the curious sight, says, "Having travelled 100 miles five days after leaving Mosega, we came to the first cattle outposts of the Matabele, when we halted by a fine rivulet. My attention was arrested by a tall and gigantic tree standing in a defile leading into an extensive and woody ravine, between a high range of mountains. Seeing some individuals employed on the ground under its shade, and the conical points of what looked like houses in miniature protruding through its evergreen foliage, I proceeded thither, and found that the tree was inhabited by several families of Bakones, the aborigines of the country. I ascended by the notched trunk, and found, to my amazement, no less than seventeen of these aërial abodes, and three others unfinished. On reaching the topmost hut, about 30 ft. from the ground, I entered and sat down. Its only furniture was the hay which covered the floor, a spear, a spoon, and a bowl full of locusts. Not having eaten anything that day, and, from the novelty of my situation, not wishing to return immediately to the wagons, I asked a woman, who sat at the door, with a babe at her breast, permission to eat. This she granted with pleasure, and soon brought me more locusts in a powdered state. Several more females came from the neighbouring roosts, stepping from branch to branch, to see the stranger, who was to them as great a curiosity as the tree-dwellers were to him. I then visited the different abodes, which were on several principal branches. The structure of these houses was very simple. An oblong scaffold, about 7 ft. wide, is formed of straight sticks. On one end of this platform a small cone is formed, also of straight sticks, and thatched with grass. A person can nearly stand upright in it. The diameter of the floor is about 6 ft. The house stands on the end of the oblong, so as to leave a little square space before the door. On the day previous I had passed several villages, some containing houses all built on poles, about 7 ft. or 8 ft. from the ground, in the form of a circle. The ascent and descent is by a knotty branch of a tree placed in front of a house. In the centre of the circle there is always a heap of the bones of the game they have killed. Such were the domiciles of the impoverished thousands of the aborigines of the country, who, having been scattered and robbed by the Moselikatse, had neither herd nor stall, but subsisted on locusts, roots, and the chase. They adopted this mode of architecture to escape the lions which abounded in the country. During the day the families descend to the shade beneath, to dress their daily food. When the inhabitants increased, they supported the augmented weight on the branches by upright sticks; but when lightened of their load, they removed these for firewood."

Let us, however, descend to terra-firma, and take note of how the—well, it matters little where we begin. Polynesia is as good a starting-place as any; let us away there and make inquiry of Mr. Turner how the Samoan builds his house. That gentleman responds willingly and promptly. He bids you imagine a gigantic beehive, 30 ft. in diameter, 100 ft. in circumference, and raised from the ground about 4 ft. by a number of short posts at intervals of 4 ft. all round, and you have a good idea of the appearance of a Samoan house. The spaces between these posts, which may be called open doors and windows all round the house, are shut in at night by roughly-plaited cocoa-nut leaf blinds. During the day the blinds are pulled up, and all the interior exposed to a free current of air; the floor is raised 6 in. or 8 in. with rough stones; then an upper layer of smooth pebbles; then some cocoa-nut leaf mats, and then a layer of finer matting. In the centre of the house there are two or three posts or pillars, 20 ft. high, sunk 3 ft. into the ground, and extending to and supporting the ridge pole; these are the main props of the building. Any Samson pulling them away would bring down the whole house. The space between the rafters is filled up with what they call ribs, namely, the wood of the bread-fruit tree, split up into small pieces, and fastened together so as to form a long rod the thickness of the finger, running from the ridge-pole down to the eaves; all are kept in their places, 1½ in. apart, by cross pieces, made fast with cinnet. . . . . The wood of the bread-fruit tree, of which the greater part of the houses are built, is durable, and, if preserved from wet, will last fifty years. The thatch is also laid on with care and taste; the long dry leaves of the sugar-cane are strung on to pieces of reed, 5 ft. long; they are made fast to the reed by overlapping the one end of the leaf and pinning it with the ribs of the cocoa-nut leaflet, run through from leaf to leaf horizontally. . . . . The great circular roofs are so constructed that they can be lifted bodily off the posts, and removed anywhere, either by land, or by a raft of canoes, but, in removing a house, they generally divide the roof into four parts, with the two sides and the two ends, where there are no particular joints left by the carpenters, which can easily be untied and again fastened. There is not a single nail in the whole building; all is made fast with cinnet. A house, after the novel Samoan fashion, has but one apartment; it is the common parlour, dining-room, &c., by day, and the bedroom of the whole family by night; they do not, however, herd indiscriminately. If you peep into a Samoan house at midnight, you will see five or six low oblong tents pitched, or rather strung up, here and there throughout the house; they are made of native cloth, 5 ft. high, and close all round down to the mat; four or five mats laid loosely, the one on the top of the other, form the bed; the pillow is a piece of thick bamboo, 3 in. in diameter, 3 in. to 5 in. long, and raised 3 in. from the mat by short wooden feet. The sick are indulged with something softer, but the hard bamboo is the invariable pillow of health. The bedding is complete with a single sheet of calico, or native cloth. The fireplace is in about the middle of the house; it is merely a circular hollow, 2 ft. to 3 ft. in diameter, a few inches deep, and lined with clay. The furniture consists of the bed and bedding, a bundle or two of native cloth, a basket, a fan or two, a butcher's knife, a fishing net, a gun strung up along the rafters, a few paddles, a wooden chest in one corner, and a few cocoa-nut shell water-bottles in another; these are about all the things in the shape of furniture or property in a Samoan house.

Being in the neighbourhood, let us cross over to Fiji. We find that the Fijians are remarkable neither for elegance, harmony, nor stability in their habitations, as, says the observant missionary, Williams, in one district a village looks like an assemblage of square wicker baskets; in another, like so many rustic arbours; a third seems a collection of oblong hayricks with holes in the sides; while in a fourth these ricks are conical. By one tribe just enough framework is built to receive the covering for the walls and roof, the inside of the house being an open space. Another tribe introduces long centre-posts, posts half as long to receive the wall-plates, and others still shorter as querterings to strengthen the walls. To these are added tie-beams to resist the outward pressure of the high-pitched rafters, and along the side is a substantial gallery, on which the property is stored. The walls or fences of a house are from 4 ft. to 10 ft. high, and in some cases are hidden on the outside by the thatch being extended to the ground so as to make the tranverse section of the building an equilateral triangle. The walls range in thickness from a single reed to 3 ft. The houses to windward of the island have the advantage in appearance, but those to leeward are the warmest. In the latter quarter patterns are wrought in the walls with cinnet and reeds. A house-builder, master of difficult patterns, is highly valued, and the work of some of them is so artistic and even elegant that it is a pity it is not more durable. Sometimes the reeds within the grass walls are reticulated skilfully with black lines. The fireplaces are sunk 1 ft. below the floor, nearly in the centre of the building, and are surrounded by a curbing of hard wood. Slight houses are run up in an incredibly short time. Williams relates that once when he was at Lakemba he passed a number of men who had just planted the posts of a house 20 ft. long. He was away for about an hour and a half, and on returning found the house finished, excepting the completion of the ridge.

Ordinary grass-houses have no eaves, but there is over the doorway a thick semicircular projection of fern and grass forming a pent. Some houses have openings for windows, and for protection against unwelcome visitors the doorways are made so low that swift and sudden entrance is extremely difficult. For thatching, long grass or leaves of the sugar-cane and stone-palm are used. The latter are folded in rows over a reed and sewn together, so as to be used in lengths of 4 ft. and 6 ft., and make a very durable covering. The leaves of the sugar-cane are also folded over a reed; but this is done on the roof, and cannot be removed, as the other may, without injury. The grass or reed thatch is laid on in rather thin tiers, and fastened down by long rods found ready for use in the mangrove forests, and from 10 ft. to 20 ft. long, and secured to the rafters by split rattans. Some very good houses are covered first with the cane-leaves and then with the grass, forming a double thatch. Sometimes the canes are made 2 ft. thick with ferns, and have a good effect; but when thicker they look heavy, and, by retaining the wet, soon rot.

The ridge of superior buildings receives much attention. The ends of the ridge-pole project for a yard or more beyond the thatch, having the extremities blackened and increasing with a funnel-shape, and decorated with large white shells. The rest of the ridge is finished as a large roll bound with vines, and on this is fixed a thick well-twisted grass cable; another similar cable is passed along the underside of the roll, having hung from it a row of large tassels.

A more animated scene than the thatching of a Fijian house can scarcely be conceived. When a sufficient quantity of material has been collected round the house, the roof of which has been previously covered with a network of reeds, from forty to three hundred men and boys assemble, each being satisfied that he is expected to do some work, and each determined to be very noisy over doing it. The workers within pair with those outside, each tying what another lays on. When all have taken their places and are getting warm, the calls for grass, rods, and lashings, and the answers, all coming from 200 or 300 excited men and boys, with voices of every imaginable key, stamping down the thatch and uttering shrill cries of exultation, produce a miniature Babel, in which the Fijian,—a notorious proficient in nearly every variety of halloo, whoop, and yell,—fairly outdoes himself. "I noticed," observes the gentleman already quoted, "three *bures ni sa*,—strangers' houses or sleeping bures. At least two of the latter are invariably found at every Fijian village or town. They may be compared to our clubs; and those frequented by the chiefs do not seem visited much by the lower orders of people. That at Bau was the largest I saw. All along the sides are sleeping-places, covered with fine mats, and large enough for two men to sleep, and between each there is a fireplace, and stages to put their legs on. Overhead a good supply of firewood is stowed. The centre of the building is covered with loose grass. There are no windows, only low doors, which may be, and always are, closed towards evening by means of thick mats, in order to keep the mosquitoes out. A large kava bowl and bamboo vessels filled with spring water seem to be the only utensils admitted. In buildings or bures like these, all the male population, married and unmarried, sleep. The boys, until they have come of age, erect a bure of their own, often built on raised stages over the water, and approachable only by a narrow trunk of a tree. The women and girls sleep at home, and it is quite against Fijian etiquette for a husband to take a night's repose anywhere except at one of the public bures of his town or village, though he will go to his family soon after dawn. In the daytime the bures are generally deserted. Towards four o'clock the people begin to pour in; and if any strangers arrive, they will invariably take up their quarters at these places. Here politics and all events of the day are discussed, and when talking the men,—even

high chiefs,—will be plaiting cocoa-nut fibre into cinnet, so much used in the construction of houses, canoes, and arms. And a great deal these people have to talk about: the politics of the groups, independent of the new element introduced by the cession of the country to England; the never-ending intrigues of the Tonguese immigration; the endeavour of missionaries, consuls, and traders to spread Christianity and civilisation, are rather complicated, and give rise to a good deal of discussion and speculation. When evening is coming on and the bure is beginning to fill, most of the fires between the sleeping-places are lit, and the natives are leisurely stretched on the mats, their legs cocked up on the stages like those of Yankees in a tavern, and all smoking their cigarettes,—made of self-grown tobacco and dry banana leaves. Now come the kava-chewers,—comely-looking youngsters,—carrying the large wooden bowl, a cocoa-nut shell for drinking the beverage, the bamboo water-vessel, a handful of fibre for straining the kava, and the root of the South Sea pepper from which it is prepared. No sooner have they taken their seats and commenced chewing, taking care to throw the rope affixed to the kava-bowl towards the person highest in rank, than a leading man, perhaps a heathen priest, begins chanting a song in which the whole assembly joins, and two young fellows beat time with little sticks applied on a bamboo or any other sounding wood that happens to be handy. The leader of the chant does not sit motionless, but waves his body, arms, and hands in such a variety of ways and with such extreme ease, that you fancy you can imitate him as readily as the whole assembly does; but the very first time you fail, to the great delight of your native spectators. His motions are not difficult, but you never know what they are going to be until it is too late to imitate, and he has already passed on to something else. The interest of this by-play is thus kept up, and the Fijians deserve full credit for having obtained hold of one of the great secrets of fixing the attention on an object, or making it, in other words, interesting. They know the art of concealing the end as long as possible. What would novelists do without the use of this machinery! How dull would life itself be if the future was unveiled to us. The lads having chewed a sufficient quantity of the root, place the masticated mass into the bowl. Now water is poured on the whole yellowish-looking fluid, strained through fibres, and a cup filled. Whilst the cup-bearer is holding it to hand to the chief, or highest personage present, an old man gives the toast, the cup is emptied in one draught, and thrown by the drinker on the mat to be filled again, and handed to the next in rank, until the whole assembly has been served. The song becomes less and less hearty, and conversation slackens, and one by one the men drop off to sleep. Strange sight. Their pillows are made of a thick stick, have four legs, and are put just under the neck, so that the hair of the sleepers may not be disarranged,—they having had it recently newly done up, washed with lime to make it frizzed like that of negroes, dyed in various colours, and arranged in many different ways. Several days must have been spent to get some of these extraordinary heads dressed. And for this reason,—no other,—they are ready to sleep all their lives on a pillow made of a stick of wood, and so constructed that a European could not rest his neck five minutes upon it without suffering dreadful pain."

Turning to Borneo, and to Mr. St. John as a guide, we travel to the village of Tungong, on the banks of the river Lundu. Here we find the curious spectacle of one building serving for almost the entire population. Tungong is enclosed by a slight stockade, and within this defence there is one enormous house for the whole population, and three or four small huts. The exterior of the defence between it and the river is occupied by sheds for prahus, and at each extremity are one or two houses belonging to Malay residents. The common habitation, as rude as it is enormous, measures 594 ft. in length, and the front room, or street, is the entire length of the building, and 21 ft. broad. The back part is divided by mat partitions into the private apartments of the various families, and of these there are forty-five separate doors leading from the public apartment. The widowers and unmarried men occupy the public room, as only those with wives are entitled to the advantages of separate rooms. The floor of this edifice is raised 12 ft. from the ground, and the means of ascent is by the trunk of a tree with notches cut in it,—a most difficult, steep, and awkward ladder. In front is a terrace, 50 ft. broad, running partially along the front of the building, formed, like the floors, of split bamboo. This platform, as well as the front room, besides the regular inhabitants, is the resort of pigs, dogs, birds, monkeys, and fowls, and presents a glorious scene of confusion and bustle. Here the ordinary occupations of domestic labour are carried on,—paddy ground, mats made, &c. There were 200 men, women, and children counted in the room, and in front, whilst we were there in the middle of the day, and, allowing for those abroad and those in their own rooms, the whole community cannot be reckoned at less than four hundred souls. Over head, about 7 ft. high, is a second crazy story, on which they stow their stores of food and their implements of labour and war. Along the large room are hung many cots, 4 ft. long, formed of the hollow trunks of trees cut in half, which answer the purpose of seats by day and beds by night. The Sibuowan Dyaks are a wild-looking but apparently quiet and inoffensive people. The apartment of their chief is situated nearly in the centre of the building, and is larger than any other. "Some thirty skulls were hanging from the roof of the apartment," continues Mr. St. John, "and I was informed that they had many more in their possession, all, however, the heads of enemies, chiefly of the tribe of Sarebus. On inquiry I was told that it is indispensably necessary a young man should procure a skull before he gets married. When I urged on them that the custom would be more honoured in the breach than in the observance, they replied that it was established from time immemorial, and could not be dispensed with. Subsequently, however, the chief allowed that heads were very very difficult to obtain now, and a young man might sometimes get married by giving presents to his lady-love's parents. At all times they warmly denied ever obtaining any heads but those of their enemies, adding, they were very bad people, and deserved to die. I asked a young unmarried man whether he would be obliged to get a head before he could obtain a wife. He replied, 'Yes.' 'When would he get one?'—'Soon.' 'Where would he go to get one?'—'To the Sarebus river.' I mention these particulars in detail, as I think, had their practice extended to taking the head of any defenceless traveller, or any Malay surprised in his dwelling or boat, I should have wormed the secret out of them."

Let us now initiate the reader into some of the mysteries of the interior of the ordinary habitation of the Abyssinian, with its clay walls and conical thatch.

The "arat" is the couch or bed on which all town Abyssinians sleep, that it to say, all those who can afford such a luxury. It is a solid framework of wood on four legs. A fresh, raw hide is cut into strips, and these are stretched over the frame in and out—one crossing the other—about an inch or rather more apart. The whole tightens in drying, and forms a rather hard, but very agreeable cool bed. It is the custom always to sleep naked, but covered with the quarrie or cotton-cloth worn in the daytime, and the only bedding used is a piece of native tanned leather, so that the air has free access from below. In these hot climates, however, it is more usual to sleep out of doors, the arat inside the house being used for cold or wet weather only, or for receiving visitors in the daytime. The "midele"—a sort of fixed couch built of stone and plaster fixed against the wall of an inner chamber—in like manner is covered with a piece of red leather, unless it happens that some wealthy dame has a carpet of Egyptian or Turkish manufacture. The pillows are mostly of wood, either a square block about 4 in. long by 3 in. broad, a little hollowed on one side for the head, or sometimes very tastefully shaped, the stand being neatly turned like a candlestick bottom. It is about 7 in. or 8 in. high, and the part on which the head rests is crescent-shaped. Some of the latter are made of ivory, and stained with henna. This form of pillow is very necessary to people who, from the custom of having their hair fancifully dressed and arranged, and plastered with butter, could not lay their heads on any ordinary one, as they would saturate it with grease, besides seriously disarranging their coiffure, so they use the hollow wooden pillow, just laying their ear on it, and allowing their hair to hang freely behind. It is rather fatiguing at first to be obliged to keep one's head for a whole night in one position, and that, indeed, not the most comfortable; but habit reconciles one to almost anything. The floor is carpeted with grass, which, in the first instance, is spread nearly 6 in. deep all over the room, and afterwards, whenever a visitor comes, a little fresh grass is politely strewed for him to sit on, so that in course of time it accumulates to a considerable quantity. Now this is one of the most disagreeable customs in the country, for, as before and after meals, and on other occasions, the hands of every person in the room are washed by a servant pouring water on them out of a drinking-horn, or any other utensil he may have at hand, you are obliged, from the want of a basin to receive the water, to scratch a small hole in the grass to prevent it splashing you. Add to this the beer and liquids spilt there every day, the manure left by the mules' feet in passing to and fro from the stable, and the cleaning out of the stable itself, which is done two or three times a week for the sake of the mules' feet, which would otherwise become softened by remaining in the wet. This last operation makes a great deal of dirt, for, having no buckets, they carry out the manure and filth in any sort of basket, gourd, or dish they can lay their hands on, dropping, of course, a good deal on the way. This carpet of grass becomes in time nothing less than a manure heap in a high state of fermentation or putrefaction. Its surface, from the continual supply, keeps an appearance of freshness; but though the eye may be deceived for a time, the nose cannot be, and the smell becoming intolerable, the whole is obliged to be cleaned out. For at least a day after this operation the house must be left to ventilate, otherwise no one could live in it. Dirty as this practice is, we cannot much complain of it in the Abyssinians, as the old English custom of strewing the room with rushes entailed consequences that would probably nowadays seem quite as disgusting. Let us now take a survey of the kitchen. Imagine a small room about 10 ft. long, 6 ft. broad, and 8 ft. high, with or without a window, according to circumstances, but more usually without one, and at all events without a chimney, so that the smoke, which is always kept going, and that vigorously, finds the door the nearest exit, and it may be easily conceived that the atmosphere is so dense as to render it difficult for any one but a native to remain long in the room. Even the cook-women, who pass the greater part of the day in this smoke, never think of standing up to do their work, but always remain squatted as low as possible, either near the door or fire. Every article the room contains becomes, like the apartment itself, of a pure soot black. The kitchen utensils are, the "magogo," or oven, if it may be so called; a few jars of different forms and sizes, according to the use they are intended to be put to,—some with long necks and narrow mouths, for keeping water in; others with wide mouths and no necks at all, for holding the liquid dough of which the bread is formed; and the earthen dishes or saucers in which the meat and other eatables are prepared and served up. The "magogo" is an oblong building, 3 ft. by 4 ft., and about 1 ft. high. It is constructed of clay and small stones, with a place in the centre for a fire. The whole is covered with a circular slab of a sort of pottery-work, being nearly the same material as that of which the dishes are formed, nicely polished on the upper surface, which is slightly concave, in order to receive more easily the liquid dough for the bread. At the back is a hole by which the smoke may escape, and in front a sort of doorway, by which the fire is lighted, and which, being placed exactly opposite the kitchen door, has always a draught of air to keep up a good fire. The cover is made of clay, and is used to keep out the smoke and dirt, and to retain the heat.

We shall next speak of the habitations of the people of the Soudan.

New Brighton.—The new (R. C.) Church of St. Peter and St. Paul, built on a site in Rowson-street and Hope-street, has been opened. The church, in which accommodation is provided for from 350 to 400 persons, is arranged with a nave and gallery, while at the east end are the chancel, a transept, and a sacristy. Early English is the style of architecture, which has been adhered to by the architect, Mr. Edmund Kirby. Mr. William Owen, of Liverpool, was the contractor.

ARCHITECTURE, AND ITS POPULAR STUDY.

IT has been asserted that architecture is distinguished by reason of its being the least popular of the fine arts. That such an assertion is founded on truth is the daily experience of most practitioners.

Every man of average education deems himself a connoisseur on the subjects of painting, sculpture, music, and poetry, yet architecture seldom evokes intelligent criticism, even from those fairly conversant on art topics generally. The popular appreciation for architecture would appear to go no farther than the acquisition of the necessary knowledge to distinguish the Italian from the Gothic building. It is an every-day question put to architects when submitting their designs, "What style do you call that?"

That misconception, not to say ignorance, largely prevails amongst the educated classes as to the general principles of architectural art was clearly shown by a recent review in the *Builder*. That an art in which all are directly interested,—the productions of which are forced upon the sight equally with those of nature,—should be so little understood, appears at first sight somewhat unaccountable. All persons are to some extent susceptible to the influence of sweet harmonies, the rhapsodies of the poet, and the glowing canvas, whilst architecture in its more refined phases is to them as an unknown language, a sealed book, a blank page. To the majority, architecture is a huge, sensuous reality, appealing to their visive organs by reason of its solidity and magnitude. It fails to awaken the pleasures of association or imagination, or to excite their interest by the intellectual impress ever present in architectural works. They are not roused by the halo of historical events inseparably connected with architecture, neither do they appreciate what Addison terms "that greatness of manner in architecture which has such force upon the imagination, that a small building where it appears shall give the mind nobler ideas than one twenty times the bulk where the manner is ordinary or little." Superficial observers are apt to admire and wonder at the pyramids, whilst failing to discover cause for admiration in the Parthenon. What impresses them is the element of *bigness*; the subtler beauties of architecture remain undiscovered. How many thousands daily pass the New Law Courts, seize upon their magnitude, and ejaculate "Fine building"! How insignificantly small the number of those who can grasp something more than bulk,—the very soul of the building,—the petrified thought! This indifference and inaptitude may be accounted for in some degree by the fact that, whereas music, painting, and poetry, are in a measure understood, and excite pleasurable emotions without demanding special knowledge of harmony, the technicalities of painting, or the rules of versification, architecture requires for its proper appreciation special study and an acquired taste. When sought this knowledge is of easy attainment, and such is the pleasure derived from its acquisition that, as Addison truly observes,—"A man having a taste for architecture is as one possessed with another sense compared with the man who has no such taste." Many reasons could be advanced showing the desirability for making the study of architecture a popular recreation, equally with the other branches of fine art, chief amongst which is its practical utility,—its great claims to being regarded as one of the most intellectual pursuits, inseparably connected as it is with the world's history, being in many instances the only remaining record of events long since passed. The study of practical architectural principles would enable all to exercise judgment and taste in the selection of their dwellings; it would afford means of ascertaining what is good or bad in construction, what required in altering, repairing, or fitting up, and what appropriate in decorating or furnishing.

All men, it is true, do not build houses, yet all men live in them; consequently a knowledge of such constructive arrangements as will contribute to comfort and convenience, and such an acquaintance with the distribution of parts as will enhance the elegance of their dwelling, ought not to be a matter of indifference to any man or woman.

Had we not cognition to the contrary, it would be only reasonable to assume that the peculiar conditions under which we live would foster the popular study of architecture, for it is characteristic of modern art that, contrary to the usual practice of the ancients, its greatest efforts are discernible in private mansions of every size and degree. This is a distinguishing feature in the practice of architecture in our own time as compared with that of prior civilisations. In former times the utmost beauty and embellishment of which architecture was capable were lavished upon public buildings, whereas the introduction of architectural pretensions into private dwellings was the exception and not the rule. To a great extent a system the reverse of this now prevails. There does not, as in ancient times, exist a popular appreciation for architecture which will sanction without murmur that lavish expenditure upon national edifices which is requisite to the production of really noble and artistic buildings. The nobleman and merchant prince will freely invest his means in an ostentatious dwelling-house for his own use, whilst failing to subscribe according to his wealth towards the erection and embellishment of local or national edifices.

If we were to argue from analogy we might be tempted to assert that architecture as an art was in a state of retrogression; for on an examination of past history we find that the popular appreciation for architecture was in inverse proportion to the elegance of private dwellings; hence, "in those ages when the grandest and most beautiful temples were erecting in Greece, the most sumptuous palaces in Italy, and the magnificent cathedrals in England, there is no evidence of much improvement having been introduced into the private dwellings even of the wealthy." To those who occupy what are called "good houses," either in town or country, a knowledge of architecture would tend to enhance the desirableness of their possession, whilst at the same time being a source of practical value to them. Its acquisition is a mark of refinement, and the "open sesame" to a vast store of intellectual enjoyment. Turn in whatever direction we please, architecture in some phase meets the eye. It can be studied in all climes, all places, and at all times. Its enjoyment demands no expense and comparatively little fatigue. Its beauties are the property of the impecunious equally with the rich; for beauty is the property of no man; it belongs to him who can *see it*. It has been truly observed by one of England's greatest writers that a taste for architecture gives a man "a kind of property in everything he sees," whilst he will frequently experience greater satisfaction in contemplating an edifice than its actual possessor. Being an art which appeals to the reason equally with the imagination, the beauties or deformities in architectural works are easily rendered obvious to the most ordinary understanding. Great and desirable results might be hoped for from the more popular study of architecture. Our towns would be projected with greater regard for convenience and comfort. Houses would be erected on sound sanitary principles, and display some degree of taste in their design and arrangements, whilst public edifices might be justly celebrated for their more than usual architectural elegance. "Jerry-builders" and "cheap-jack speculators" would soon become extinct. Miles of verdant fields would then give place to something more worthy our boasted intelligence and pre-eminence than vulgar vernacular villas. It is rarely that architecture has the opportunity for benefiting by the intelligent criticism of those outside the ranks of its professors. This, however, would no longer be the case were the study of this art once made popular. Whilst anxious to see architecture popularised, it is not our intention to make every man an architect; for we cannot countenance the "every-man-his-own-doctor" principle, but simply to create in the minds of the populace an intelligent appreciation for the best artistic work; to cherish a national feeling of respect founded on admiration, without which, as Ruskin says, "a great school of architecture cannot exist." Architecture embraces so much that it is difficult to define clearly where is the beginning and where the end. Equal pleasure and profit may be derived from its study by the philosopher, scientist, historian, poet, painter, priest, or layman. The art is universal; co-eval with man, providing his shelter whilst living, his tomb when dead. It has been observed that no institution can be established without its aid. "It gives to art its gallery, to science its museum, to literature its library, to education its colleges, to benevolence its asylums, to religion its temples." It is frequently alluded to in sacred writings, and all the sciences are more or less laid under tribute in the erection of even some of the least remarkable buildings: chemistry in the composition of materials; geology in the selection of sites and building materials; conic sections and geometry in setting out the domical roof, the noble Gothic vault, or elaborate tracery; statics in general structural stability, counterpoising the thrust of arches or resisting downward pressures; dynamics when opposing bodies in motion; optics when studying general æsthetic refinements: acoustics when arranging buildings for public discourse or musical entertainment; physiology and the laws generally pertaining to health, in the planning of dwelling-houses; law, in its relation to the construction of buildings, the preparation of contracts and agreements, the subject of ancient lights, easements, boundaries, party structures, dilapidations, fixtures, and titles. That the professor of an art embracing so much should accumulate a vast store of miscellaneous information is absolutely imperative, and it is equally essential that he keep himself "abreast of the times" as regards artistic, scientific, and sanitary knowledge. If not a philosopher, he must cultivate a philosophical temperament; for probably no other professors are so frequently opposed and thwarted in their legitimate aspirations by monied vulgarity or unlettered ignorance. He must be a man of refinement, business tact, and withal, courteous; for has he not to propound his ideas to his noble patron; direct their practical execution by the artisan, and frequently reconcile conflicting opinions and opposed interests? Notwithstanding the numerous claims which architecture has upon the attention of all cultivated minds, yet its unpopularity has resulted in the architect being looked upon by thousands of fairly intelligent people as a "man who draws."

This is all the more to be regretted, seeing that it requires but a mere superficial examination as to the true position of architecture to discover what an essential part it performs in our every-day life, and also the many points of view from which it may be studied. Architecture provides the noblest frame-work for painting and sculpture. The greatest painters, sculptors, workers in mosaic and precious stones, have deemed it an honour to aid in the embellishment of the architect's creations, and the landscape gardener has put forth his best efforts to beautify the "stately homes of England,"—

> "Embosom'd high in tufted trees."

An architect has the noble privilege of improving nature. The abbeys, castles, mansions, villages, spires, forges, mills, bridges, scattered amongst the hills and valleys, enhance the beauties of nature and give contrast and animation to the scene. Many of these buildings are rich in historical association,—others but of yesterday for future generations to gaze upon and admire. A halo of sacred mysteriousness surrounds the many venerable piles:—

> "The lonely turret, shatter'd and outworn,
> Stands venerably proud,—too proud to mourn
> Its long-lost grandeur."

Might we not truly say of many of the ruined abbeys of England and their delightful surroundings,—

> "It is a spot under these northern skies
> Beautiful as a wreck of Paradise."

The popular study of architecture would tend greatly to augment the pleasure of travellers and tourists. In the works of architecture there is an exhaustless, never-ending variety. From the most northern Gothic pile to the rock-cut temples of India, how wonderful is the display of human industry! We have here the impress upon matter of a thousand generations; their intellectual seals; their gorgeous epitaphs! What, we may ask, are countries without their architecture? Is it not for this that we visit Egypt, India, Greece, and Normandy? What more impressive than the ruins of Karnack, Luxor, Thebes? What more fanciful or gorgeous than the Courts of the Alhambra? What are the attractions in Rome, Venice, and Athens? Are not the Colosseum, St. Peter's, St. Mark's, the Pantheon, St. Sophia, the Parthenon, and many of our own cathedrals, poems in stone, histories in themselves? A celebrated French writer speaks in rapturous terms of St. Peter's, as clothing the idea of God in all the splendour of which it is capable; and our own Macaulay, writing of the same building, says,—"In I went, and I was, for a moment, fairly stunned by the magnificence and harmony of the interior. I

never in my life saw, and never, I suppose, shall again see, anything so astonishingly beautiful. I really could have cried with pleasure. I rambled about for half an hour or more, paying little or no attention to details, but enjoying the effect of the sublime whole." Many similar impressions have been chronicled, yet how many of those who visit the cathedrals of York, Westminster, Ely, Salisbury, Milan, Antwerp, Cologne, Constantinople, and a thousand other places, fail to thoroughly appreciate the many beauties, both of design and construction, or can dwell on the charms of historical association, for lack of a little previous study?

Architecture is a favourite theme with the poet, many of his figurative expressions being borrowed from its vocabulary, whilst it is for ever linked with the greatest names in history. Kings, statesmen, philosophers and poets have obtained lasting fame by reason of their connexion with and patronage of architecture.

Such is the pleasure to be derived from the study and contemplation of the glories of this art that every man and woman who professes cultivated taste should regard a knowledge of architecture as "no honour to have it, but a dishonour not to have it." There exists around this study a peculiar charm apart from any theories of art. As an archæological study it constitutes one of the most fascinating inquiries; for whether we trace its progress through ancient or modern times, it is so intimately connected with all that is remarkable in the world's history that a knowledge of it will give equal pleasure, and its acquisition be as profitable to the mind, as a smattering of two or three dead languages. We trust that what we have advanced in favour of the more popular study of architecture will prompt non-professional readers to devote a small portion of their leisure to acquiring the rudimentary principles of an art which "embraces all that is beautiful," whilst at the same time it can awaken emotions and pleasing memories within the breast of the learned and unlearned, the rich and the poor, the king and the cottager, presenting as it does in innumerable instances veritable "sermons in stone."

J. G. B.

"SPENCER, SPARE THAT TREE."

As was noticed in these columns not long since, much opposition has been expressed to the proposal for removing from before the old entrance to the South Kensington Museum the superb plane-tree with its encircling seat, that for so long has been a familiar feature to all visitors to that wonderful institution. Since the new entrance to the Museum has been opened, the old tree has been sadly neglected, and now, of the thousands of visitors who pass through the busy turnstiles, only a few of those who recall the commencement of the museum probably ever bestow a glance on the old tree whose existence is threatened. It is sincerely to be hoped that it will be spared. Though our metropolis is so green, it can ill afford to lose so characteristic an adornment, and we trust the authorities of the Science and Art Department will do their best to preserve it.

The old plane-tree is something more than a mere tree; it is, like, indeed, most of the older trees of the metropolis, a landmark. The tree was once part of Old Brompton Park, which will be found marked on the maps of some forty or so years since. Almost under the shadow of its branches stands the now almost ruined lodge in the secluded private garden of the museum on the left of the new entrance. Even at this moment the old place shows strong remains of its past beauty. On this ruin, for such it has become, may be seen a tablet stating in enamelled letters that in the house had resided "Benjamin Franklin, artist [*sic*], philosopher, and statesman."

EASTBOURNE SANITARY EXHIBITION.

THE arrangements for this exhibition, we hear, are progressing satisfactorily, and a successful result is expected. Lectures will be delivered by Dr. Alfred Carpenter, on the evening of the opening day,—Monday; on Tuesday by Professor Robert Kerr; on Wednesday by Mr. E. C. Robins; on Thursday by Mr. George Wallis; on Friday by Mr. E. W. C. F. Schmidt; and on Saturday by Mr. I. Skone. The afternoon lectures will be delivered by Mrs. Johnstone, of Hastings, Mr. Mardon Mowbray, Mr. F. G. Cooke, and others.

FROM FOREIGN SERIALS.

ITALY.

Le Journal d'Italie (July 7).—Amongst the exhibits at the Milan Exhibition, which are referred to in this number, is the class for cremating apparatus. Many various systems are represented; those of Polli and Clericetti, Venini and Poma, Betti and Teruzzi, and Guidini.——Amongst the numerous anatomical preparations exhibited are some specimens prepared by Dr. Efesio Marini, of Naples. By means of a process which is not described, he has succeeded in converting human remains into a substance as hard and durable as marble, whilst retaining their colour and texture. He exhibits as a specimen a mosaic bowl, composed of fragments of various portions of the human body.

GERMANY.

Dingler's Polytechnisches Journal (July).—The two numbers for the present month contain an abstract of the papers read at the general meeting of the Society of German Cement Manufacturers. It is too long for us to give more than the titles of the various papers. These are: "The Influence of the various Degrees of Fineness in the binding power of Cement," by Mr. Somei, who also gave an account of new apparatus for grinding and screening cement; "The Scientific Drying of the Materials," by A. Bernoully, who described the various furnaces and stoves for the purpose. The question of the best system for testing cement and for the preparation of the briquettes, was the subject of a discussion, in which a number of speakers took part. The subject will be resumed next month, when we may recur to it.

FRANCE.

Revue Industrielle (July 20).—The Société Technique de l'Industrie du Gaz has announced that the following premiums will be given in connexion with the industry which it represents:—4,000 francs to be distributed amongst the authors of the best papers presented at the meeting in 1882; 2,000 francs to be divided amongst the introducers of the most important improvements in gas-lighting; 250 francs for each of the best papers presented to the meeting of the present year; 500 francs (given by the Lyons Gas Company) for the best system of heating by gas; 200 francs to the foreman or workman showing the longest service in a gas-works.

This number of the *Revue* contains illustrations of a new surveying instrument, called the topographical square, invented by M. A. Penesau. It is composed of a metal mirror whose plane makes an angle of 45° with the line of vision, and having a thread down its median line. It is fixed on a gun-barrel, which also carries a sight, and has below the mirror a weight of lead and wood, kept in its place by a spring, and released by pulling a trigger. The object of the apparatus is to find the perpendicular of any given spot. A pole having been previously fixed on the place whose perpendicular is required, the operator holds the instrument like a gun, looks through the sight, adjusts the "square" in the direction of the pole, and walks on until it is reflected exactly upon the thread which marks the middle of the mirror. As the line of vision passes through the eyehole of the sight to this median thread, and as the mirror is at an angle of 45° to the line of vision, so soon as the image of the pole falls upon the median thread, the foot of the perpendicular has been reached. The operator touches the spring, and the weight falls to the ground and marks the spot.

THE LATE DEAN STANLEY.

SIR,—I have been reading the report which you (alone, I think) published more than three years ago (*i.e.*, in April, 1878) of the interesting and eloquent funeral sermon preached by the late Dean Stanley on the occasion of the death of Sir Gilbert Scott. In that sermon occur these words:—

"We cannot forget him. Roof and wall, chapter-house and cloister, the tombs of the dead and the worship of the living,—all speak of him to those who know that his hand and his eye were everywhere amongst us."

How truly applicable are the words of the preacher to the preacher himself! The whole sermon is well worth reading, and possesses a melancholy interest at this time. L.

HEALTH AND ART QUESTIONS: SOCIAL SCIENCE ASSOCIATION.

THE following are the special questions in the two departments most interesting to the majority of our readers to be discussed at the Dublin Congress, October 3rd to 8th:—

Health Department.—1. Is it desirable that hospitals should be placed under State supervision? 2. Is it (*a*) desirable that there should be a system of compulsory notification of infectious diseases, and, if so (*b*), what is the best method of carrying such a system into effect, and (*c*) what is the best method of enforcing the isolation of cases of infectious disease? 3. Is any further legislation desirable in order to more effectually prevent the overcrowding of dwelling-houses.

Art Department.—1. What should be the condition of copyright as regards music, painting, sculpture, and the fine arts generally, considered in relation to the Bill introduced into the House of Commons? 2. What should be the relations of painting and sculpture to architecture? 3. What is the influence of the annual exhibitions of contemporary pictures and sculpture on art and public taste?

ARCHITECTURAL AND SANITARY EXHIBITION AT INVERNESS.

IT is intended to open a museum of architectural, building, and sanitary appliances in Inverness, in August next.

Inverness, the capital of the Highlands, and the business-centre of a very extensive district, is considerably removed from manufacturing towns, and the architects and builders have difficulty in bringing before their clients examples of articles specified or wanted, and recourse has to be had to catalogues and lists, which, at the best, convey but a faint idea of the reality, or samples have to be sent for, entailing considerable delay and inconvenience. An exhibition, therefore, of such articles as are constantly wanted in the building and other allied trades cannot fail to prove beneficial alike to exhibitors and to the public.

Intending exhibitors should apply at once for space to Mr. Daniel Warren, the secretary.

SMOKE ABATEMENT.

ON Tuesday afternoon a meeting was held at Grosvenor House for the purpose of receiving a report from the committee appointed at a previous meeting of the National Health and Kyrle Societies, to consider the steps which should be taken towards abating the mischief occasioned, especially in large towns, by smoke. The chair was taken by Mr. Ernest Hart, and amongst those present were the Princess Louise, Marquis of Headfort, Sir Algernon and Lady Borthwick, the Hon. Rollo Russell, Lord Thurlow, Admiral Sir Spencer Robinson, Dr. C. W. Siemens, the Earl of Dartrey, Mr. S. Morley, M.P., Mr. G. Cubitt, Mr. A. T. Amherst, M.P., Lady Hobhouse, Earl of Carysfort, Lord Arthur Russell, M.P., Professor Abel, &c.

Mr. W. Coles (honorary secretary) read the report of the committee, which stated that in view of the increasing size of towns and the injury to health resulting from the excess of smoke, the objects the society had in view were considered to be of the greatest importance, and called for public support.

Dr. Siemens moved "That the present smoky atmosphere of London injuriously affects the health and happiness of the community, besides destroying public buildings and deteriorating perishable fabrics, and entailing in various ways unnecessary expenditure." As long as twenty years ago he had directed his attention to the subject of economising fuel, and subsequently to that of consuming smoke. It was evident that smoke was the result of imperfect combustion, and imperfect combustion was caused by the irregular supply of fuel to the grate. Gaseous heat, he contended, was double that of coal heat, given the same proportions of fuel used. It was true, however, that at present gas cost more than double the amount that ordinary fuel cost. The difficulty could, however, be overcome by the gas companies if they would separate their illuminating from their heat-supplying gas, and sell the latter at a low price. By a combination of coke and gas a fire representing as nearly as possible an ordinary coal fire, without, however, having any smoke, could be secured.

Sir H. Thompson seconded the motion; and

Dr. Quain said he entirely agreed with the views expressed by Dr. Siemens, and hoped he would not rest from his labours until those views were practically carried out.

The motion having been carried, the following resolutions were also adopted:—"That this meeting approves of the action of the Smoke Abatement Committee of the National Health and Kyrle Societies, in promoting the exhibitions and trials of improved heating and smoke preventing appliances, to be opened at South Kensington in October next." "That this meeting will support the efforts now being made to reduce the evil arising from coal-smoke, and will assist in raising the funds necessary for completely carrying out on a practical scale competitive testing of the various appliances to be shown at South Kensington, and for providing the funds necessary for suitable prizes, medals, &c."

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,000. G. Crawford, Port Glasgow. Self-closing taps, &c., and apparatus for checking waste of water. July 8, 1881.

3,002. J. Griffiths, Weobley. Apparatus for purifying smoke. July 8, 1881.

3,020. H. Howitt, Ilford. Sash bar for horticultural buildings. July 9, 1881.

3,037. J. Gooddy, Wombwell. Securing the joints of earthenware and other piping. July 11, 1881.

3,055. C. M. Scott, Dalkey. Disinfecting apparatus. July 12, 1881.

3,067. J. Gilmore, Lower Norwood, and W. R. Clark, Peckham. Apparatus for accelerating an outward draught from chimneys, &c. July 13, 1881.

3,079. J. Cornforth and E. T. Burton, Birmingham. Open fire-grates. July 14, 1881.

3,081. W. Dawes, W. H. Thompson, and D. Thompson, Leeds. Water-closets and urinals. July 14, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

July 12, 1881.

1,859. T. C. Fawcett, Leeds. Brickmaking machinery. April 29, 1881.

2,743. H. H. Lake, Southampton-buildings. Construction of Pavements. (Com. by D. McLean, New York, U.S.A.) June 22, 1881.

July 15, 1881.

1,033. G. Hunter, Leeds. Apparatus for consuming smoke in furnaces or fire-places. March 10, 1881.

1,038. W. R. Lake, Southampton-buildings. Water-closet apparatus. (Com. by A. Edwards, Philadelphia, U.S.A.) March 10, 1881.

1,380. W. E. Crowther, Manchester. Ornamental screens for fire-places. March 29, 1881.

1,815. H. Sutcliffe & W. Sutcliffe, Halifax. Moulding of water-closet cisterns. April 27, 1881.

2,636. G. J. Cox, Maidstone. Gas cooking and heating stoves. June 16, 1881.

2,793. J. L. Seymour, New-cross. Venetian blinds. June 25, 1881.

2,813. E. Lee, Leeds. Producing designs on tiles, glass, &c. June 27, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending July 16, 1881.

4,990. J. Bruce, Birmingham. Apparatus for opening, closing, and fastening casements, sashes, &c.

These are hung on pivots. A lever has a fixed fulcrum at its lower end, and the upper end has a stud which fits into a slotted hole in the upper corner of the sash. The lever, at some point intermediate of its length, is connected by a link to a rod which is laid down and connected to a hand lever, by which it is actuated. Nov. 30, 1880. Price 6d.

4,997. W. Morgan Brown, Southampton-buildings. Making doorways, &c., close and tight.

The frames are made with the corners rounded off and without the usual rabbet or stop, but, instead, a smooth bevelled seat extending all round. The door is also round cornered with a continuous bevelled edge, which is grooved to receive a packing of india-rubber or other material. (Com. by G. B. Thompson, Pitston, U.S.A.) Dec. 1, 1880. Price 10d.

5,078. S. H. Adams, Leeds. Apparatus for flushing drains.

A small syphon is placed within a larger one, so as quickly to withdraw the air therefrom and bring it into action. A small hole is made in the larger syphon above the point at which the liquid is drawn off, so as to make the action intermittent. (*Pro. Pro.*) Dec. 6, 1880. Price 2d.

5,099. W. Stead, Northallerton. Meters, &c.

These are applicable for both liquids and gases. Feathering discs are mounted in pairs on axles passing through a central shaft, and enclosed in a casing, which has an expanded acting channel, which the disc entirely fills up for half the revolution, when it comes to a contracted return channel, by which it is automatically flattened, at the same time opening the opposite disc. Dec. 7, 1880. Price 6d.

5,112. W. Wildig, Chester. Flushing apparatus for closets and drains.

A circular drum is made to revolve on a pipe, and is placed in a tank. The liquid being supplied to the drum it turns over and discharges its contents. (*Pro. Pro.*) Dec. 8, 1880. Price 2d.

5,116. R. Schloesser, Manchester. Water-meters, &c.

A circular shallow vessel has a central vertical spindle on which are six horizontal arms, three of which carry wings which exactly fill the passage through which the water flows. The passage has a partition on one side, so that the water is forced to take one direction. The other three arms exactly fill the space over the top of the partition, so that they form stops between the inlet and outlet passages. The wings are hung loosely on the arms so that they can pass over the partition also. The revolving spindle is attached to the usual counting gear. (Com. by MM. Dreyer, Rosenkranz, & Droop, Hanover.) Dec. 8, 1880. Price 6.

5,126. J. A. Mays, Great Winchester-street. Valves, &c.

A collapsible diaphragm is used in conjunction with a ball-valve, to close the aperture for the passage of the water when the ball-sinks. (*Pro. Pro.*) Dec. 8, 1880. Price 2d.

5,201. B. C. Cross, Dewsbury. Trough water-closets.

This is an improvement on Patent No. 2,324 of 1878 in that the urine is conveyed away by a separate channel, and fills the small tank which controls the syphon, instead of water as previously claimed. (*Pro. Pro.*) Dec. 11, 1880. Price 2d.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

ARCHITECTS' BENEVOLENT SOCIETY.

A SPECIAL general meeting of contributors to the Architects' Benevolent Society was held on Tuesday afternoon last in the Council Room of the Royal Institute of British Architects, Conduit-street, to confirm the new edition of the by-laws, as revised at the annual meeting held in March last. The President, Mr. John Whichcord, was in the chair, and there were present Mr. G. J. J. Mair, Mr. Ewan Christian, Professor Hayter Lewis, Mr. Henry Currey, Mr. J. H. Good, Mr. H. L. Florence, Mr. E. l'Anson, Mr. Matt. Wyatt, and Mr. W. H. White, hon. sec.

The minutes of the annual general meeting having been read and confirmed, it was resolved that the by-laws, as revised, be adopted. Most of the alterations which have been made in them are consequent on administrative changes which were felt to be desirable when the society passed under the *ægis* of the Institute. These changes have been effected with the view of securing efficiency combined with economy of administration.

We may perhaps usefully call the attention of our readers to the concluding words of the report of the Council presented at the last annual meeting:—

"The total income of the Society, from subscriptions, barely exceeds 300*l*. The number of contributors during the past year is less than 250, and these are to a large extent recruited from the Institute. Yet, though the professional members of that body now number nearly 800, only 140 Fellows and Associates contributed to the Society's funds during 1880. Considering the increasing numbers entering the profession, and the many practising architects in the populous cities of the United Kingdom and Ireland, the Council trust it will not be in vain to earnestly impress on contributors the necessity of obtaining additional subscribers and donors, remembering that all who run a race cannot win; that distress, disease, and affliction may overtake the most prosperous, and compel many a professional brother, his widow and children, to seek assistance from the Society to alleviate the sad consequences of such reverses."

THE BUILDERS' BENEVOLENT INSTITUTION.

THE thirty-fourth annual meeting of this Institution was held at Willis's Rooms, King-street, St. James's, on Thursday last, Mr. Thomas F. Rider, president, in the chair.

The report, read by the secretary, Major Bratton, reviewed the affairs of the Institution during the past year, and congratulated the subscribers and donors on the result, which had been most gratifying, owing to the energy and liberality of the president. While feeling extremely grateful for the liberal donations received, the committee urge the necessity of obtaining new annual subscribers, and hope that the present subscribers will take every opportunity of bringing the Institution under the notice of those who do not as yet subscribe. The annual ball, as usual, was in every way a success, rendered so by the energetic honorary secretary, Mr. F. W. Keeble, who was supported by an efficient number of stewards, and to whom the committee offer their grateful thanks. The committee also express their thanks to the "Thalian" Amateur Dramatic Company, for the very excellent performance they were kind enough to give at the Imperial Theatre in May last, in aid of the funds of the Institution, and especially to Mr. Douglas Fourdrinier for originating and carrying out the entertainment, which was so successful both financially and as a dramatic performance. Nine pensioners have been elected during the past year, and eight have died.

The balance-sheet, audited by Messrs. J. H. Hunter, J. Crattenden, and R. J. Ward, shows that 1,632*l*. 19s. 8d. was paid to pensioners during the year, besides 38*l*. paid as burial money. The balance brought forward from last year was 788*l*. 1s. 4d. The annual subscriptions amounted to 810*l*. 2s. 6d., and the donations to 977*l*. 4s. 6d. The profit on the annual ball was 54*l*. 7s. 11d., and the profit on the theatrical performance was 102*l*. 6s. The dividends on invested fund amounted to 643*l*. 2s. 8d., and there remained a balance of 1,349*l*. 15s. 4d. at the bankers'.

The report and balance-sheet having been adopted, it was resolved, on the motion of the chairman, seconded by Mr. Plucknett, to alter Rule II. by omitting the words, in sections 1 and 6, "for each candidate to be elected."

A vote of thanks was passed (on the motion of Mr. Plucknett, seconded by Mr. Thomas Stirling) to Mr. Rider for his services as president during the past year; and votes of thanks were also given to the vice-presidents, trustees, treasurer, auditors, and committee. Mr. Plucknett was re-elected treasurer, and Mr. Keeble was desired to again act as hon. sec. for the ball. It was unanimously resolved that George Burt, E.q., J.P., ex-sheriff of London and Middlesex, and a member of the firm of J. Mowlem & Co., be elected President of the Institution for the ensuing year; and it was announced that the annual dinner will be held at the Freemasons' Tavern on the 3rd of November.

NEW BATHS AT LONGTON, STAFFORDSHIRE.

THE Longton Public Baths, erected by the municipality, have been completed and opened.

The first-class swimming-bath leads out of the corridor facing the hall. The dimensions of this bath are 70 ft. by 40 ft.; the depth at the shallow end 3 ft. 4 in., shelving down to 6 ft. 4 in. at the deep end, giving an average depth of 3 ft. 9½ in. The floor of the bath is laid with white glazed bricks, interspersed with blue diving lines. The water is supplied to this and to all the other baths from the main of the Staffordshire Waterworks Company. The bath contains, when full, upwards of 60,000 gallons of water. At the shallow end of the bath, to the right of the entrance, is fixed a copper "spray pipe," by which a spray of water may be projected over a considerable portion of the bath. This is with the view of aërating the surface of the water, so as to keep the bath fresh and cool for a long time, besides serving as a shower-bath for the bathers. There are twenty-four dressing-boxes, twelve on either side, surmounted by a substantial gallery for spectators. In the second-class swimming-bath, which adjoins the one just described, the arrangements are, in the most essential points, similar to those of the first-class bath. The dimensions are 55 ft. 6 in. by 30 ft., the depth being from 3 ft. 3 in. to 5 ft. 6 in. The floor and sides are cemented in place of the white glazed bricks of the other bath. The capacity is about 48,000 gallons.

The portion of the baths devoted to ladies is approached through the hall nearest the clock-tower. The fittings and arrangements are the same in every respect as those of the other divisions. There is at the extreme end of the corridor, to the left of the entrance-hall, a plunge-bath. There are two first-class private warm baths (fitted with showers), and one vapour bath. The second-class division contains four

warm baths. There is also a dressing-room in the basement of the clock-tower adjoining the plunging bath.

The engineering arrangements consist of two steam boilers,—each 16 ft. by 5 ft.,—which supply the heating power for the swimming-baths, the supply of hot water for the private and vapour baths, and also steam for driving the very complete steam laundry, which is on the ground floor above the boilers. The washing-machines used are Bradford's "Vowels." In the laundry is fixed Bradford's improved water-heater. This is supplied with steam from the boilers, which passes through a copper coil: the condensed water after entering the waste is returned direct into the boilers. The heating of the swimming-baths is accomplished by means of "live" steam injected into the water of the baths direct from the boilers. This has been found, after considerable experiment, to be the most economical way of heating baths. In proof of this an experiment was carried out the other day by Mr. Arden Hardwicke, the borough engineer, when the second-class swimming-bath was heated from a temperature of 53 deg. to 75 deg. in two hours and a half, and with a very small consumption of fuel.

The whole of the building has been designed by the borough engineer, Mr. Arden Hardwicke, Assoc.-Mem. Inst. C.E., and the work has been executed under his immediate supervision. The contractors for the building are Messrs. H. & R. Inskip, of Longton. The boilers, machinery, and engineering work, including the plant in the laundry, have been produced by Messrs. Thomas Bradford & Co., of Manchester, under the personal superintendence of Mr. Alfred Giles. The plumbing work is being executed by Mr. G. H. Plant, of Longton; and the whole of the gas arrangements are by the Corporation's gas department. The estimated cost of the whole of the building, including fixtures, &c., is 8,000*l.*

SOCIAL.

RESPONDING to a hearty invitation from Mr and Mrs. I'Anson, the President and Council of the Royal Institute of British Architects paid them a visit on the 22nd inst. at their country residence, Grayshott Park, Hants. Mr. I'Anson is one of the original members of the Institute, and many of his brother members of the council were glad of the opportunity of showing their regard for him. A pleasant journey through a pretty country, a *déjeûner à la fourchette*, and a ramble through the somewhat extensive grounds, with their bright piece of water, sufficed to fill up all the time at their disposal.

The party included Mr. G. E. Street, R.A., the president; Professor Hayter Lewis, V.P.; Mr. Ewan Christian, V.P.; Mr. Charles Barry, past president; Mr. F. C. Penrose, M.A.; Mr. A. Blomfield, M.A.; Mr. David Brandon, F.S.A.; Mr. Jas. Brooks, Mr. Arthur Cates, Mr. Clarke, Mr. W. White, F.S.A.; Mr. Macvicar Anderson, Mr. Henry Currey, Mr. John Gibson, Mr. C. Hansard, Mr. E. B. I'Anson, Mr. A. Waterhouse, A.R.A.; Mr. E. Woodthorpe, a near neighbour; and Mr. William H. White. Sir Frederick Leighton, P.R.A.; Mr. Salvin, and some few other private friends of the host and hostess, as well as some few members of the Council, were kept away by previous engagements.

Although strictly a private visit, we fancy this brief record of a pleasant outing will not displease any who were concerned.

MR. JAMES ALLANSON PICTON, ARCHITECT.

WE hear with the sincerest pleasure that a letter has been received from Mr. Gladstone announcing that the Queen has been pleased to confer the honour of knighthood on Mr. James Allanson Picton, author of the "Memorials of Liverpool," and for over thirty years a member of the Liverpool Corporation. Mr. Picton took a prominent part in public life as the founder and director of the Liverpool Free Library and Museum, and on the opening of the Picton Reading-rooms two years ago was entertained at a public banquet, presided over by Lord Derby. We have on many occasions, ranging over a series of years, expressed our admiration of Mr. Picton's unflagging endeavours to benefit his native town, and have assisted in making known his own admirable works, and we rejoice greatly that his services are to be fittingly recognised.

SALE OF A LARGE BUILDING ESTATE, WOOD-GREEN.

LAST week Messrs. Fox & Bousfield offered for sale at the Auction Mart an important freehold property, designated the Chitt's Hill Estate, situated at Wood-green, on the high road to Southgate, and described as within six miles from the city, and within ten minutes' walk of four railway stations. The auctioneer stated that the property comprised a spacious mansion and forty-one acres of land, immediately available for profitable development by being divided into building plots. He observed that if they gave him 1,000*l.* an acre for the property, it would be less than the value of land in the locality. The first offer was 20,000*l.*, and the property was ultimately sold for 29,000*l.* A freehold residence, with seven acres of land, situated between Tottenham and Southgate, was next offered, and sold to the purchaser of the previous lot for 7,000*l.*

OPENING OF THE CLACTON-ON-SEA WATERWORKS.

ON Tuesday last the Directors of the Clacton-on-Sea Gas and Water Company formally opened their waterworks at Clacton. The ceremony of starting the engines and pumps, and turning on the water to the town mains, was performed by Mr. S. Chaplin, Mayor of Colchester, in the presence of a large assembly. The engineer, Mr. Jabez Church, M. Inst. C.E., who designed and carried out the works, explained the working of the machinery, and conducted the party over the works, which were tastefully decorated with flags and flowers. The Mayor, in an appropriate speech, declared the works to be opened. The party then walked through the company's gasworks (which adjoin the waterworks), where the process of gas manufacture was explained, and afterwards assembled at the Royal Hotel to do justice to a good dinner.

These waterworks were commenced in May, 1880 (trial borings having previously been made), by the sinking of an artesian well to the depth of 120 ft. from the surface, with a boring continued to a depth of 405 ft. into the chalk. The water, which is said to be of a remarkably good quality, is pumped into the tower by a 15-h.p. engine, and "bucket and ram" pumps in duplicate.

The tower itself, which is built of red brick with Bath stone dressings, is 101 ft. high, and contains a wrought-iron circular tank, holding over 30,000 gallons, which is carried on wrought-iron girders. The service of water will be constant, and the pressure of water sufficient to throw a powerful jet over the highest house in Clacton.

The contractor for the well and main-laying was Mr. T. Tilley, of Walbrook; for the engines, boiler, pumps, and tower-tank, &c., Messrs. H. Young & Co., of Pimlico; Messrs. Saunders & Son, of Dedham, Essex, were the builders, and Mr. H. Caldicott was the clerk of works.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT BEDFORD.

ON Monday the annual congress of the Royal Archæological Institute was inaugurated at Bedford. The president of the meeting is Mr. Charles Magniac, M.P., of Colworth Park.

At twelve o'clock the Mayor and Corporation of Bedford welcomed the arrival of the members of the Institute in formal state at the New Corn Exchange, when the town clerk read a congratulatory address, acknowledging the honour paid by the Institute to their ancient town. This address was followed by others from the Bedfordshire Antiquarian and Architectural Society, and from the committee of the local Literary Institute, which were all courteously acknowledged by Lord Talbot de Malahide.

Mr. Magniac, the president of the meeting, delivered an inaugural address, in the course of which he heartily welcomed the arrival of the congress, and expressed a hope that they would turn to good use the opportunity of investigating the antiquities of the county and neighbourhood, and would assist the local students by their wider experience. He drew a brief sketch of the past annals,—for they could hardly be styled history,—of Bedfordshire under the Romans, Britons, Saxons, and Normans, and enumerated the chief points at which the annals of Bedfordshire threw a light on those of England. In confirmation of a remark made by Lord Talbot de Malahide, he expressed a hope that before long an attempt would be made to compile a systematic county history of Bedfordshire,—a work which could never be satisfactorily executed except by co-operation and sub-division of labour. He concluded by drawing the attention of the meeting to the great and important light that had been thrown on the history and civilisation of ancient peoples in the far distant East by the researches of Layard, Rawlinson, Wilkinson, and Schliemann, remarking that England also, and even Bedfordshire, had a past, and that that past was well worthy of serious study.

A large number of ladies and gentlemen were subsequently entertained by the Mayor and Corporation at luncheon in the Corn Exchange, and during the afternoon the members of the Institute, under the guidance of the local secretaries, perambulated the town, visiting the site of the old castle and its keep, the churches of St. Mary and St. Peter, and the remains of the Greyfriars Priory on the west side of the town. The evening was devoted to the reading of papers in various sectional meetings at the public rooms, which have been placed at the disposal of the members of the congress during the week.

MORNINGSIDE.

SIR,—The information in your Edinburgh article as to the purchase and proposed conversion of the United Presbyterian Church at Morningside into a literary institute is not quite accurate. The cost of the alterations is estimated at only 800*l.*, and not 2,000*l.* This is the recommendation of the provisional committee, but of course the plans will be subject to revisal by the directors of the company when formed. They (the committee) did not think that they would be justified, from the limited revenue they expected, in going to greater expense meantime. They had particularly in view, too, the fact that the usefulness of a kindred institution situated in the suburbs of Edinburgh has been much impaired by its being started with too large a capital. With regard to the "air and space" in the proposed lecture-room, I may mention that the height from the floor to the ceiling will be 28 ft.

A MEMBER OF THE COMMITTEE.

LEITH IMPROVEMENT SCHEME.

SIR,—In a notice of the Leith Improvement Scheme, which appeared in the *Builder* of the 25th June last, the writer of the notice, in referring to the writer of this letter, states that the objector appeared in person before the Committee of Parliament, but that his objections were more devoted to the working of the Act than to the merits of the scheme.

This is a misconception of my position. My objections were entirely based on the proved fact that there was in reality no scheme of improvement submitted, there not having been one particle of reconstruction shown or provided for in the plans,—or rather plan, for there was only one of them,—before Parliament, or in existence. The Act itself is a good Act when faithfully administered.

JAMES HEDDLE.

DAMP: A QUESTION.

SIR,—I should like to have the opinion of some of your readers as to the cause of the following curious phenomenon. It is that of the cellars of a house, the floors of which are invariably *wet* in dry weather and *dry* in wet weather. The floors are formed of concrete and Portland cement, and the level of same is about 5 ft. below the level of the ground outside. The house stands upon a clay soil.

The land round about the house is drained by means of agricultural drain-pipes, laid about 3 ft. below the surface.

X. Y. Z.

CHURCH-BUILDING NEWS.

Holtby.—The small but interesting old church of Holtby, near York, having undergone restoration and refitting, has been re-opened. The cost of the work has been about 1,000*l.* Churchwarden restorers 100 years since had taken down the upper part of the stone building, removed the leaden roofs and ancient mullioned windows, and replaced the walls with brick and the windows with sashes, but fortunately they were content to go thus far without disturbing the foundations. Several feet of stonework, and what is believed to be the base of an ancient apse, remained untouched. The form and workmanship of these remains, it was thought, pointed to a very early origin, and the architect (Mr. J. R. Naylor, of Derby) has given due weight to these remains as indicative of the style adopted. The contractors for the works were as follow: — Mr. W. Rookledge, carpenter and joiner's work; Mr. C. Kilvington, mason, bricklayer, and plasterer; Mr. Dodgson, tiler's work; Messrs. Hodgson & Son, plumber and glazier's work; Mr. Boynton, painter's work, all being residents of York.

Newcastle (Staffordshire). — St. George's Church was re-opened on the 8th inst. after restoration. The church was erected about fifty-three years ago by the Ecclesiastical Commissioners, and is of the style of Gothic archi-

tecture in vogue at the commencement of its revival. About two years ago considerable alterations were made to the east end, as far as the funds permitted, by the formation of a chancel out of the eastern bay of the nave, and the formation of a proper choir therein. The completion of the whole scheme of restoration has now been carried out by the removal of the high-backed pews, the re-arrangement of the aisles, and the re-seating of the whole church with open benches of pitch pine. The interior has been cleaned and painted. The old stone paving has been removed from the aisles, and new tile paving by the Campbell Brick and Tile Company substituted for it. The projecting part of the west gallery has been removed, and the remaining part of this gallery over vestries has been re-seated, and a new front of pitch-pine added. A new font, by Jones & Willis, of Birmingham, has been fixed near the south door. Just before the closing of the church on Easter Day of this year, a new stained-glass window, by Messrs. Hardman, of Birmingham, was placed at the east end of the south aisle. It was the gift of Mr. R. Mosley, as a memorial to his daughter. Since then the old east window has been removed, and a five-light tracery window substituted for it. This will shortly be filled with stained glass by Messrs. Hardman, and is the gift of Mr. H. Coghill. A new tile reredos is in course of preparation by Messrs. Minton, Hollins, & Co. The whole of the works have been carried out by Messrs. H. & R. Inskip, of Longton, from the designs and under the superintendence of Messrs. Thomas Lewis & Sons, architects, Newcastle. The cost of the restoration has been about 1,400*l.*

Westleigh.—The Bishop of Manchester has consecrated the new Church of St. Peter at Westleigh, which has been erected at a cost of 7,000*l.* by Mrs. Sarah Walker Hampson, of Cheltenham. The site, which contains 1,460 square yards, has been given by the Rev. J. H. Stanning, vicar of Leigh. The church has been built from the designs of Messrs. Paley & Austin, architects, Lancaster, and will seat 424 persons.

STAINED GLASS.

Barton-on-Irwell.—A stained-glass window has just been erected in Barton-on-Irwell Church, Manchester. The window is in character with the style of the architecture, viz., Early English. The subject illustrated is the Parable of the Sower, treated in medallions, the centre medallion containing the principal figure of the Sower, and the upper and lower medallions "The end of the world, with the reaping angels," and "The enemy sowing tares while the husbandmen sleep." The work was designed and executed by Messrs. Shrigley & Hunt, Lancaster and London.

Edinburgh.—A stained-glass window, dedicated to the memory of the late R. S. Grindlay by his fellow-students, has been erected in the Chapel at Fettes College. The three main compartments contain a representation of the scene at our Lord's sepulchre on the morning of his resurrection, as recorded in the 20th chapter of St. John. The rich Flamboyant tracery is filled with diapered glass. The design and execution of the glass are by Messrs. Ballantine & Son.

Charterhouse, London.—Three Munich windows representing the Crucifixion have just been erected by Messrs. Mayer & Co., in the Church of St. Mary, Charterhouse, to the memory of the Rev. W. B. R. Jacobson, a former vicar of the parish; and a fourth light, containing a figure of St. Peter, in memory of Captain Rowland Bentinck Codd, late Governor of H.M. Prison, Clerkenwell.

Micheldever.—During the week ending July 2nd, a stained glass window was placed in the west end of the parish church. The style of glass used is that of the fifteenth century. The window is a six-light one, in two tiers of three each, the first light, which is in the upper tier, representing Mary (the mother of Jesus); the second, Jesus Christ; the third, Martha; the fourth, the Women at the Sepulchre; the fifth, the Angels at the Sepulchre; and the sixth, St. John and St. Peter, St. Peter being represented holding keys. The work reflects great credit on the firm of Messrs. Clayton & Bell, of London.

Bristol.—A large window has been fixed at the west end of Christ Church (Congregational), Sneyd Park, Bristol, to the memory of Mrs. Derham, wife of Mr. James Derham, of Sneyd Park. The window was designed and executed by Messrs. Camm Brothers, of Smethwick, near Birmingham. It contains eighteen subjects typical of the Old and New Testament history.

Birmingham.—A new window has been placed in the north side of the chancel of St. Martin's Church, Birmingham, as a memorial to the late Rev. Canon Miller, of Greenwich, formerly rector of St. Martin's, by the members of the congregation. The subjects of the window are selected from the life of St. Paul, and are as follows:—"St. Paul's Conversion," "Before Festus and Agrippa," "Prisoner at Rome," and "Paul at Athens." The window contains three lights and traceries. The upper portion of the lights is occupied by the large subject of "Paul on Mars Hill." Paul as the central figure stands with his hand uplifted, delivering his message; and below him are the Areopagites seated, with other listeners, among whom is Damaris, standing or seated behind them. At the back of Paul rises the Acropolis, with its walled enclosure and temples. Below this subject, and divided by a band containing the text, "Then Paul stood in the midst of Mars Hill, and said, 'Ye men of Athens, I perceive that in all things ye are too superstitious," are the three minor subjects. The window has been designed and executed by Messrs. Camm Brothers, of Smethwick.

Newington.—The large east window of St. Andrew's Church, New Kent-road, has lately been filled with stained glass. The subjects represented are the "Crucifixion," "Resurrection," "Healing the leper," and "Christ blessing children." In the tracery is represented the "Majesty" surrounded by cherubs, the "Agnus Dei," "Pelican in her piety," and several other emblems. The window is the gift of Mr. Jerman Nobes, and has been designed and executed by Mr. Charles Evans.

SCHOOL BUILDING NEWS.

Tollington Park, Holloway.—The new buildings at the Collegiate School, Tollington Park, recently erected at the cost of Mr. R. Wills for the Principal, Mr. W. Brown, were opened a few days ago. The new school-room (which is on the first floor) is 62 ft. long by 29 ft. wide, and 23 ft. from floor to apex of roof, with communications on each side to adjoining houses; the one at entrance being the residence of the Principal, the other house being devoted to the use of the masters and boarders, while the ground-floor is arranged as class-rooms connected with the school-room. The roof is of composite construction, having wrought-iron trusses with fir wrought purlins and ridge, covered with wrought and jointed boarding, roofing felt, and slates. The floor, which is also composite, is carried by rolled iron girders on piers built in cement, with buttresses on outside of wall, and by cast-iron columns in centre of each girder; at the west end of room a platform is constructed to receive the organ, also for the use of pupils during examinations. The iron-work was supplied by Messrs. Measures Bros. The ventilation is by inlets from below the floor, opening into the room at dado level. For the artificial lighting, two sunlights are provided. The space immediately under the school-room is devoted as a cloister for the use of pupils during the wet weather. The playground is laid with tar paving supplied by Messrs. Hobman & Co. The walls of the school-room are faced externally with picked stocks. The front elevation, which is of a Queen Anne character, is built of stocks, relieved with red brick dressings, with terra-cotta balustrade and capping. The entrance and lights to cloisters are provided with wrought-iron gate and grille. The works have been carried out by Mr. Harold, from the designs and under the superintendence of Mr. F. H. Stringer.

Grampound.—Sir John St. Aubyn, bart., M.P., has laid the foundation-stone of the new Wesleyan Sunday-school building at Grampound. Messrs. Gillard & Bennett are the architects, and Messrs. R. Tregunna & B. Turner are the contractors.

Lewes.—New Sunday-schools for St. Michael's parish, Lewes, are now in course of erection by Mr. Edward Pullinger, builder, the architect being Mr. Philip Currey.

Truro.—The Lord Mayor of London recently laid the foundation-stone of the Cornwall Wesleyan Middle-class Schools at Truro. The schools, which will accommodate about 150 boarders, besides day-scholars, are of Gothic design, and built of local stone, with brick and granite facings. Mr. Ewtwell, of West Bromwich, is the architect; and the contractors are Messrs. Julian & Sons, Truro. The amount of the contract is 5,185*l.*, including the building of the master's residence.

Books.

Dirty Dust-bins and Sloppy Streets: A Practical Treatise on the Scavenging and Cleansing of Cities and Towns. By H. PERCY BOULNOIS, C.E. London: E. & F. N. Spon. 1881.

THE object of this little book is not merely to assist surveyors of towns in their endeavours to do their duty properly, but to interest the householders in the subject, and lead them to aid in the good work. It is well calculated to effect these purposes. Mr. Boulnois arrives at the opinion that the work of the collection of house-refuse and cleansing the streets should be carried out by the local authority with their own officers and staff, and that executing this work by contract is a mistake and a false economy. It may possibly be true that it may be done in the latter manner at less actual cost to the ratepayers, but he thinks, and we agree with him, all public work should be done in the best manner possible, irrespective of cost, thoroughly, but without extravagance, and that the result of such work, especially where it affects the cleanliness and the appearance of a town, soon fully repays any moderate extra cost that may thus have been incurred, irrespective of the enormous benefit that is conferred upon any community by the reduction of disease and the death-rate by a proper attention to such necessary sanitary work.

Miscellanea.

Building Stones in America.—The United States Census Bureau has undertaken an important work in collecting information relating to quarries of building, flagging, ornamental, and other kinds of stone in all parts of the country. The inquiries cover not only the location and extent of the stone, but the amount of capital employed, the annual output, methods of quarrying and dressing, number of hands employed and wages paid, methods of transport and their cost, number of structures of all sorts made of each sort of stone, and so on. All of the quarries in the United States which produce such an amount of material as to give them anything more than local importance are to be visited by gentlemen of scientific reputation. In many areas, these gentlemen are the State geologists; in others, they are professors or architects. The statistics which are to be gathered by these gentlemen will give the locations of all important quarries; the kind of stone which they produce; the uses to which it is applied; the extent to which it is used in the neighbourhood, or shipped to distant points; the amount of material which is annually produced; the amount of material which has been produced as indicated by the area of the excavation; the size of a single block which has been extracted; the size of a block which might be extracted if desired; the structure of the stone as regards stratification and jointing; a description of the methods employed in quarrying, in dressing, and in transporting the stones; and scientific information concerning the geological age, and the forms in which the stones are found. Appended to the schedule upon which this statistical information is gathered, there are a number of pages which are to be devoted to remarks and to information which applies to the individual quarry under consideration. Dr. Hawes says the work has progressed so far "that we are able to say, that from the experience and knowledge of the parties who are gathering the statistics, we are obtaining a vast amount of most valuable information under the head of these remarks. And we also know that already in these remarks we have a great deal of information which will prove of much value to those who employ stones in construction." He rightly urges the importance of microscopic examination of stone.

City Property.—At the Auction Mart, a few days ago, Messrs. Edwin Fox & Bousfield sold the premises, No. 63, Gracechurch-street, occupying an area of 1,500 ft., with a frontage of about 14 ft., let at 160*l.* per annum, for 10,900*l.* Also two houses in Plough-court, Fetter-lane, let at 225*l.* per annum, for 4,500*l.*

A Brave Workman.—At a meeting of the Chapter of the Order of St. John of Jerusalem in England, held last week at St. John's Gate, Clerkenwell, General Sir John St. George, K.C.B., presiding, the silver medal for saving life on land was unanimously voted to George Everett, of Gloucester, for rescuing Edward Prickett, on June 13 last, from a position of great difficulty and danger. Some workmen were taking down a girder at the old City Gasworks, Gloucester. Prickett was on an iron column, 40 ft. high, at one end, and a man named Newey at the other. Suddenly the girder broke in the middle. Newey was flung into an adjoining tank and killed immediately. Prickett tried to jump on to the roof of an adjoining house, but was caught by a rope, and was thrown back into the cap at the top of the column, and became insensible. Attempts were made to reach him with a ladder, but the oscillation of the pillar was so great as to threaten to throw him out of the cap. Everett therefore volunteered to ascend the pillar, and did so by "swarming." He then held Prickett securely until ladders were so placed that he could lower him with a rope, at a risk of falling a depth of 80 ft., though fortunately he succeeded in descending himself also in safety.

The Tapestry at St. Mary's Hall, Coventry.—This fine old tapestry, which has been exhibited at South Kensington Museum for several months, has been returned and re-hung. The restorers are Messrs. Bartlett & Co., 18, Blenheim-street, Great Marlborough-street, London, who were entrusted with the work, on the recommendation of Mr. George Scharf, the director of the National Portrait Gallery, Messrs. Bartlett having effected the restoration in a manner that leaves no room to doubt their conscientious and faithful labours. Mr. Scharf says there is little doubt that the design of the tapestry was Flemish, and that it was most probably manufactured in this country. He considers it a fine example, but in describing it to the Society of Antiquaries in November last he said it was woven, not embroidered. The date he assigns to be about 1490, from the fact of the persons represented being Henry IV. and his Queen Margaret, and the members of his Court, but the costumes being characteristic of the reign of Henry VII. appeared to him to indicate that the work had been done in the time of that monarch.

St. Alban's Abbey Church.—At the last meeting of the Council of the Archæological Institute the following resolution was proposed by Sir Sibbald Scott, seconded by Mr. Matthew H. Bloxam, and carried unanimously:—"That the Council of this Institute desire to place on record the expression of their great regret at what they believe to be the unnecessary destruction of a large portion of the west front of St. Alban's Abbey Church, which has lately been carried out." Copies of this resolution were ordered to be sent to the chairman of the Restoration Committee and to the rector of St. Alban's.

Messrs. Macnaught, Robertson, & Co., of Bankend, Southwark, have issued a new section-book, in which they have classified the various sections of iron in most general use as much as possible, and in many cases given almost every variation of size capable of being rolled. From their extensive connexion with the leading English and Continental houses, together with their London stock and arrangements, we have found the firm able to supply with great promptitude. The present issue is likely to be of permanent use to home consumers as well as foreign shippers.

Horncastle's Newspaper List, 1881-82, is carefully compiled, and will be found handy to advertisers. Mr. Horncastle, in pursuit of his business as an advertising agent (a very well-known one too), gives in the shape of a preface some striking examples of the sums spent by particular individuals and firms in advertising, and the successful results of the course. He is quite right in saying it is of no use advertising in fits and starts; it must be done continuously and done wisely.

Exeter Art Exhibition.—An Art Exhibition,—confined to exhibitors in the county of Devon,—will be opened in the Albert Museum, Exeter, on the 15th of August, 1881.

Herr Ferdinand Keller, who first discovered remains of the ancient pile dwellings of Switzerland, died on the 21st inst., at Zurich, in his eighty-first year.

The Staff, to the number of forty, of Messrs. Merritt & Ashby, builders, dined at the King's Head, Chigwell, on Saturday last.

Tramways.—The tramway, as the parent of the railway, will always be regarded with interest in connexion with the subject of locomotion. The Gloucestershire *Chronicle* says:—When the practicability of using an iron line upon the ground for the passage of a wheeled vehicle was demonstrated, it was at once seen how greatly would be economised the force required to impel it, and, like many other simple things, it was a matter of astonishment that it had not been thought of before. The first iron road, we believe, was made at Whitehaven, in 1738, and a railway was laid down in Sheffield by John Carr in 1776. The term tram-roads is a perversion from Outram-roads, named after Mr. B. Outram, their inventor, in 1800. The iron tram-road from Wandsworth to Croydon was made in 1801, and in the same year the first iron railway was sanctioned by Parliament, with the exception of some which had been made by canal companies for branches to mines. In the following year the first locomotive engine ran, and in 1825 the Stockton and Darlington Railway, constructed by Stephenson and Pease, was opened. After this the use of tramways spread to coal-pits and quarries, and the improvements effected in the steam-engine necessitated modifications in the first forms which were used for railways.

Exhibition at Gandia, Spain.—A circular issued by the managing committee of this exhibition, which is to be opened at Gandia during the month of October next, announces that the railway trains and tramways running between Carcagente and Gandia have reduced 50 per cent. of their tariff fares on all the articles which may be carried by them for the above-mentioned exhibition, provided they are despatched during the month of September next. The committee therefore requests intending exhibitors to secure the accommodation necessary for their exhibits before the 15th of September, as it is the desire of the committee to afford every facility to all classes of exhibitors who may wish to join in this exhibition, which is expected to be very interesting, as stated by the industrial organs of Spain. Gandia is an agreeable town in Valencia, noted for the industry of its inhabitants, besides having some linen factories. Much hemp and flax grows here, and the culture of silkworms is carried on very extensively.

Sanitary Plumbing.—The sixth and last of Mr. Hellyer's lectures on the science and art of sanitary plumbing (given under the auspices of the National Health Society) was delivered on Thursday evening last, in the Hall of the Society of Arts, John-street, Adelphi, Professor Henry Robinson, C.E., of King's College, in the chair. We shall report the lecture,—which was to be repeated this (Friday) evening, the 29th,—in our next. In deference to an expressed desire, it has been arranged to hold a meeting for the discussion of Mr. Hellyer's lectures on Monday, the 15th prox., when Mr. Ernest Hart is expected to preside. Those who wish to speak on the occasion are desired to send their names to the Secretary of the National Health Society, 44, Berners-street.

Fatal Fall of a Building.—A child named Grace Jones, aged ten years, has died in Guy's Hospital from the results of injuries she sustained by the falling of a building in Southwark-square, Union-street, Borough. The "square" is reported to contain a number of wretched houses, long unoccupied, and which are stated to be the property of the Ecclesiastical Commissioners. Other children were seriously injured by the fall of the building. The line of the South-Eastern Company runs within a few yards of the portion of the premises which fell.

Bedford Park, Chiswick.—If any of our readers overlooked the advertisement in our last, announcing the proposed transfer of this estate to a company, and inviting applications for shares, they may be glad to have their attention directed to it. Full particulars, of what is a very interesting experiment, are given, so that intending investors can judge for themselves as to the prospects of the proposed company.

Sale of the late Sir Charles Reed's Mansion and Grounds, Tottenham.—We are told that this property was really purchased by the United Land Company for resale in plots in the ordinary course of their business.

Slate in Canada.—We hear that a valuable discovery of slate has recently been made on property owned by Mr. J. J. Vickers, of the Vickers Express Company, Toronto, within eleven miles of Fort William, Thunder Bay.

TENDERS

For the erection of new Coffee Tavern premises, 22, Paradise-street, Marylebone, for the Right Hon. the Viscountess Ossington. Mr. Chas. Fowler, architect:—

Watson Bros.	£3,995 0 0
Fairchild	3 893 0 0
Bangs & Co.	3,650 0 0
J. R. Hunt	3,674 0 0
Staines & Son	3,572 0 0

For the erection of a new school at Steam Mills, near Cinderford, Gloucester, for the Forest of Dean United District School Board. Mr. Alfred Smith, architect. Quantities by the architect:—

Pearson & Son, Ross	£2,752 0 0
D. C. Jones & Co., Gloucester	2,428 0 0
H. King, Glouce-ter	2,388 0 0
A. C. & S. Billings, Cheltenham	2,256 0 0
Coleman Bros., near Gloucester	2,215 0 0
H. Downton, Cinderford	2,200 0 0
Duggan & Norce, Hereford (accepted)	2,170 0 0

For additions and improvements to 4, Champion-park, Camberwell, for Mr. S. Dresser Rogers. Mr. R. P. Wheelock, architect. Quantities by Mr. H. E. Pollard:—

J. W. Sawyer	£994 0 0
J. Page	979 0 0
W. Smith	965 0 0
B. Colls & Sons	942 0 0
J. Tverman	877 0 0
J. Vears & Co. (accepted)	875 0 0

For the erection of a dwelling-house, stables, and coachman's house at Carsick Hill, Sheffield, for Mrs. Birks. Mr. Edward Robert Robson, architect:—

Ridal & Arnison	£10,627 10 6
J. Hall, Thorp	9,905 15 0
Chadwick & Co.	9,679 0 0
J. Tomlinson & Sons	9,044 0 0
Job Stone	8,837 0 0
Wm. Bissett & Son	8,500 0 0

For the erection of four shops on the Oak Lodge Estate, Edgware-road, Kilburn, for Mr. R. Rose. Quantities by Mr. H. E. Pollard. Mr. W. Graves, architect:—

Kirk & Randall	£4,580 0 0
Bolding	4,425 0 0
Scott	4,335 0 0
Jackson & Todd	4,328 0 0
Hard & Pollard	3,898 0 0
Stimpson & Co.	3,869 0 0
Kellond	3,600 0 0
Toms	3,364 0 0
Ward & Lamble (accepted)	3,233 0 0

For alterations and building new stables at North-street, Marylebone, for Messrs. Carnick & Co. Mr. H. G. Wyatt, architect:—

White	£1,375 0 0
Longmire & Co.	1,198 0 0
Wildman	997 0 0
Ward & Lamble	962 0 0

For repairs and painting at 68, Hamilton-terrace, St. John's-wood, for Mr. W. Todd. Mr. R. E. Pownall, architect:—

Clarke & Manncoch	£239 0 0
J. Tinson	204 0 0
W. H. Butcher	175 0 0

For pulling down 103 and 104, High-street, Winchester, and building new premises, for Mr. T. A. Brown. Mr. A. W. Galbraith, architect. Quantities supplied:—

	Credit Old Material.
Sims Bros., Basingstoke	£8,050 ..... £100
McManus, London	6,295 350
Mackie, Winchester	5,689 ..... —
Patman & Fotheringham, London	5,832 350
Fielder & Son, Winchester	5,458 300
Stevens & Sons, Southampton	5,557 300
Marsh, Winchester	5,750 800
Carter & Son, Winchester	5,670 400
Sealey, Winchester (accepted)	5,439 531

For building a dwelling-house in the Longbridge-road, Barking, Essex, for Mr. W. Bewers. Mr. C. J. Dawson, architect:—

Howe (accepted)	£618 0 0

For building a house and shop in the Broadway, Barking, Essex, for Mr. J. Pearson. Mr. C. J. Dawson, architect:—

Mansfield, Stratford	£711 0 0
Barnes, Ilford	709 0 0
Argent, Barking	698 0 0

For proposed alterations and repairs to premises, 44, Lamb's Conduit-street, for Messrs. T. Minn & Sons. Mr. C. J. Dawson, architect:—

Lawrence	£550 0 0
Wells & Son	488 15 0
Langmead & Way	477 0 0

For alterations and repairs at the Greyhound, Milton-street, City, for Mr. Manley. Mr. H. J. Newton, architect:—

Minchin	£398 14 0
Burman	368 0 0
Walker (accepted)	280 0 0
New Counter.	
Skinner	£135 0 0
Heath	129 0 0

For alterations to the Crown beerhouse, Chapman-street, St. George's-in-the-East, for Mr. Prior. Mr. J. G. Needham, architect:—

Marr	£250 0 0
Poole	235 0 0
S. W. Hawkings	226 0 0

For repairing and painting the Aged Pilgrims' Asylum, Camberwell. Mr. R. P. Wheelock, architect:—

J. Maraland	£185 0 0
S. Cooper	146 0 0
F. Hawkes (accepted)	123 0 0

For the erection of a new Baptist Chapel, Gipsy-road, Lower Norwood. Mr. Hampden W. Pratt, architect. Quantities by Messrs. Evans & Deacon :—

Higgs & Hill	£4,680 0 0
Shillitoe	4,495 0 0
Bowyer	4,250 0 0
Deacon & Co.	4,198 0 0
Goddard & Sons	3,988 0 0
Smith & Sons, South Norwood (accepted)	3,967 0 0

For new cabinet, &c., at the Fountain and Grapes, High-street, Borough, for Mr. Richmond. Mr. H. J. Newton, architect :—

Warne (accepted)	£650 0 0

For rebuilding the church and repairing the tower at Wimels, Macclesfield, for the Building Committee. Mr. R. Witts, architect. Quantities supplied :—

Burrows & Moseley	£1,126 8 0
Moores (accepted)	1,123 18 10

For erecting and completing model dwelling-house, Nos. 16 and 17, Church-way, Somers-town, for Mr. Chas. Deakin. Messrs. John Saville & Son, architects :—

Fawkes	£1,813 15 0
Temple & Forster	1,700 0 0
Anley	1,627 0 0
Royal	1,616 0 0
Wall Bros.	1,599 0 0
Wood	1,498 0 0
Richardson (accepted)	1,365 0 0

For erecting and completing stabling and dwellings above, in the Grove, Chapel-street, Somers Town, for Mr. George Earley. Messrs. John Saville & Son, architects :—

Temple & Forster	£1,186 0 0
Wood	1,097 0 0
Hawkins	1,063 14 0
Wall Bros.	1,015 0 0
John Anley	980 0 0
Richardson	955 0 0
S. Walton	949 0 0
Royal (accepted)	859 0 0

For repairs, &c., to 16a, Hampden-street, Somers Town, for Mr. Carn. Messrs. John Saville & Sons, architects :—

Shiers	£221 0 0
Wicks	190 0 0
Royal	178 0 0
Sims	165 10 0
Hawkins	155 0 0
Hyde	115 0 0

For the erection of manager's house and other premises, High Barnet, for Messrs. Elliott & Fry :—

Marriott Bros., High Barnet	£1,950 0 0
G. & J. Waterman, Watford	1,899 0 0
W. James, Barnet	1,795 0 0
W. J. Beale, Battersea	1,637 0 0

For three chapels, registrar's house and offices, front boundary walling, railings, gates, piers, &c., at the West Derby Cemetery, Liverpool :—

Tomkinson & Son, Liverpool	£18,243 0 0
Hughes & Stirling, Liverpool	16,950 0 0
Middlehurst, St. Helen's	15,841 4 3
Yates, Liverpool	15,498 0 0
Woods & Son, Liverpool	15,293 0 0
Mattack, Keighley (accepted)	14,718 8 1
Total of lowest separate tenders	14,471 11 10

For two blocks of infirmary buildings, New Shoreham, Sussex, for the Board of Guardians of the Steyning Union. Mr. Samuel Johns, architect. Quantities by Mr. F. Thompson :—

Marshall	£12,184 0 0
Perry	11,473 0 0
Kirk & Randall	10,820 0 0
Morris	10,740 0 0
Wall Bros.	10,685 0 0
Longley	10,637 0 0
Peters & Redford	10,275 0 0
Chappell	10,000 0 0
Cru tenden	9,711 0 0
Jones & Co.	9,364 0 0
Cook & Co.	9,197 0 0
W. J. Beale (accepted)	8,777 0 0

For taking down and rebuilding wall at Norwood Cemetery. Mr. E. l'Anson, architect. No quantities supplied :—

Lathey Bros.	£399 0 0
Piper	344 0 0
McLachlan & Sons	290 0 0

For alterations to premises, Buckingham Palace-road, for Mr. Gorringe. Mr. Walford, architect. Quantities supplied :—

Adamson & Sons	£4,375 0 0
Dove Bros.	4,240 0 0
McLachlan & Sons	4,140 0 0
Patrick & Sons	4,069 0 0
Hall, Beddall, & Co.	3,751 0 0

For building House of Retreat, Lloyd-square, Clerkenwell. Mr. Newton, architect. Quantities by Messrs. Palmer & Ruault :—

Chappell	£9,003 0 0
Patrick & Sons	8,955 0 0
Booth	8,850 0 0
Bangs & Co.	8,830 0 0
Brass	8,710 0 0
Dove Bros.	8,510 0 0
Higgs & Hill	8,420 0 0
McLachlan & Sons	8,392 0 0
Tyerman	8,077 0 0
Perry & Co.	7,547 0 0

For alterations and additions to 4, Farnley-road, Catford-bridge, for Mr. W. Elkerton. Mr. N. W. Hopton, architect :—

Eldridge & Gee (accepted).

For rebuilding 141, Southwark Park-road, for Mr. G. Kirby :—

Eldridge & Gee (accepted).

For repairs and additions to premises, 72, Great Prescott-street, for Mr. Friedlander. Mr. J. Hudson, architect. Quantities not supplied :—

Wyard	£337 0 0
Halett	319 0 0
Calnan & Co.	279 0 0
Rives	213 0 0

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All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Builder.

VOL. XLI. No. 2099. SATURDAY, AUGUST 6, 1881.

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Pompeii and Herculaneum.

IN the voluminous correspondence of Horace Walpole will be found an interesting letter, dated June 14th, 1740, N.S., sent home from Naples almost at the moment that the first excavations of Herculaneum made known to the world the treasures that were buried beneath the lava and the ashes of Vesuvius. In this letter, addressed to Richard West, the grandson of Dr. Burnett, the botanist, Walpole writes:—"This underground city is perhaps one of the noblest curiosities that has ever been discovered. It was found out by chance, about a year and a half ago." The truth of this prophecy has singularly been fulfilled. A few years only elapsed from that date, during which time Pompeii and its treasures were unearthed, until the artistic world of Europe was made as familiar almost then as we are now, with the wonders of the buried cities of the Campania, through the great works of Gell and Hamilton, the "Antichità d' Ercolano" and its French translation, and the exquisitely-rendered engravings of that master of illustrated publications, Piranesi, and his industrious assistants. All interested in Pompeii will remember the superb work of Lieut.-Col. Cockburn, "Pompeii," published as far back as 1819, and the letter-press accompanying the drawings in which,—one of these, representing the eruption of Vesuvius, was from a sketch by the late John Martin,—was from the pen of an earnest student, who still lives, loved and respected, among us,—Professor Donaldson.*

What has since those days been done in excavating Pompeii has been made known to the world from time to time in these columns, but notwithstanding the industry and care that have been bestowed during the last few years on the excavations, it will be found that but little has been recovered beyond repetitions of the wonders that were revealed during the first years of the discovery. In revisiting the Museo Borbonico after many years, the artist will find but little more than many additions to the antiquarian portions of the museum. Exceptions, of course, there are, but nothing equal in any case to the famous series so long known as the *Dansatrice*, although among the newly-found bronzes, perhaps the small drunken Faun, discovered within the last few months, is, in our estimation, likely to rank high among the noblest existing works of antiquity, the bronzes of the Greek artists. Archæologically and architecturally this discovery is most interesting, as the house in which this great Greek work was discovered was one of those of the latest erection in Pompeii, and unique in its architecture. Ill-constructed arches had been introduced, springing direct from the columns of the *peristyle*,* and the walls are miserably decorated.

It is very near where this bronze was so recently discovered that those who remember Pompeii in the old days will be reminded of its entrancing beauty and interest before the Government had taken upon itself the care of the classic city, and before it was determined—as it was necessary to do—to protect the crumbling walls by aid of brick-supports and over-hanging tiles, a sad necessity which has destroyed cruelly the picturesqueness of the outline in nearly all the familiar points. We remember some years since, not many years before the death of the late accomplished Frederick Cockerell, that he passed some time at Pompeii in sketching with his careful hand and thoroughly well-instructed mind the ruins of the city; these sketches, wherever they may be, should be preserved.

For the moment the excavations now being proceeded with are retarded by the obstinacy of the owner of a farm that has quietly existed for some centuries over what we may be quite certain is a very interesting portion of the buried city; the work is retarded, fortunately, we may say, because from what we have lately seen at Pompeii it is only at about this spot that the old picturesqueness of the Roman ruins can be seen as they were some years since. The rest of the city, with its wonderful interest, is now better kept, in better order, cleaner and better drained, than perhaps any other city in Italy; its houses all duly numbered, the streets distinctly marked, the roads and by-ways in perfect order, with a thorough system of police, scarcely a blade of grass allowed to grow in its now crowded streets, crowded by strangers from all parts of the world, all of whom enter this ancient Roman city by a patent turnstile which turns not before each visitor has deposited his two francs towards the continuation of the excavations. By this means the Government of Italy obtains yearly the very handsome sum of about 30,000 francs, with every prospect of this revenue increasing greatly year by year.

Those who have known Naples for some time find the pleasure of a visit to Pompeii is greatly destroyed by the modern system of entering through a turnstile, and when one is not provided with a special permission to wander about at leisure, the conduct over the ruins, even by the civil Government official who is tailed off to each party of visitors, would, we suspect, be to Mr. Arthur Sketchley or Mr. Barnard exceedingly provocative of merriment; for notwithstanding the attention of the custodians, the extraordinary variety of strangers that have to be trotted round in the course of the day gives rise to the most amusing episodes that sadly interfere with the serious object of a visit to Pompeii. Indeed, during a recent visit, we observed the possibility of Pompeii being made at times almost as great an aid to those lovers of social amenities, that large class of people who visit the Continent with the idea of increasing their visiting-list at home, as Mentone, Nice, or any other of the fashionable resorts. The time has certainly come when it is exceedingly risky to visit Pompeii in one's ordinary travelling costume, unless one is utterly regardless of that nice attention to the fitness of "get-up" that marks a correct sense of the exact hour of the day.

Notwithstanding the change in the system by which one now visits the ruined town, and notwithstanding the large element of destruction afforded by the numbers of strangers who literally invade, especially at certain seasons, the deserted streets, the old features possess none the less interest, and the visit to Pompeii and the insight it gives us into the life of our classic forefathers remains unquestionably one of the most vivid impressions that one bears away from a tour in Italy. One has seen before reaching Naples many museums and, above all, many towns, but they have become too much modernised to impress any but the most imaginative; but in Pompeii we find a city of the ancients almost untouched. The streets and pavements are the same they trod 2,000 years ago, and the deeply-worn wheel-marks in the well-paved stone streets speak of the busy traffic of a city not so very unlike our own great centres of population. After one or more visits to the superb museum in Naples, with its marvellous collection of works of art and scarcely less artistic domestic utensils, furniture, and what not, the existence in the houses that one is shown becomes realisable, and as the still plainly legible election programmes and notices of apartments to let conspicuously painted on the street front of many of the houses meet the visitor at every turn, as the theatres and the baths, the shops and the market-places, the temples and the tombs, follow each other, he gains in a few short moments a clearer insight into the life of these past generations so strikingly like and yet so different from our own, than the years of school teaching and familiarity with classic authors have been able to give. Here he sees the scattered relics of the art of these days in their original places, and can picture with more or less accuracy the surroundings that are wanting.

With the large space of Pompeii so far excavated, it can be understood how impatiently certain students look upon the slowness of the advance made. Considerably more than half of the known area of the city remains still buried, and a century and a half has been passed in unearthing the portion with which we are now familiar. If we mistake not, the present director of the excavations has calculated that at least another seventy to eighty years are necessary,—continuing the explorations at the

* Pompeii: Illustrated with Views, &c. The descriptive letter-press to each plate by T. L. Donaldson. London: Murray. 1819 and 1827. Two vols. folio. The work is of the same form as Stuart's "Athens."

* It is this very interesting feature to which Mr. Russell Forbes alluded in our columns not long since. See *Builder*, July 9, 1881, p. 44.

existing rate,—to unearth the whole city. In the mean time, there are not wanting partisans who sadly deplore the activity of the excavations on the somewhat sentimental ground that we are robbing our descendants of the pleasure that we have so largely experienced in the progress of the works during the last two generations. Certainly those who come after us cannot hope to see the city as we do; for those who remember Pompeii before the days of Signor Fiorelli, and the energy he introduced into the work, will tell one how sadly the beauty of the general effect has suffered, in spite of the learned director's efforts to arrest the injuries of exposure to the air and light.

There is, again, another race of students who take a higher ground, and who would wish the excavations of Pompeii to give way to a more systematic exploration of Herculaneum, as a field of far greater profit; who argue,—and certainly with truth,—that from what we know of Pompeii we may judge of what remains; that further research will tend far more to satisfy the archæologist and antiquary than the artist, while the buried houses of Herculaneum hide in their gloom and obscurity treasures of classic art of far greater interest than any that are likely to be found at Pompeii, with the character and tastes of whose inhabitants we are now more or less familiar. Certainly these earnest students are justified by what the very unsystematic excavations of Herculaneum have so far revealed. The choicest bronzes of the Museo Borbonico came from Herculaneum, the excavations of which remain yet scarcely commenced for want of funds to overcome the great difficulties met with. Our small knowledge of Herculaneum has shown us that its inhabitants were superior in their tastes to their neighbours at Pompeii, which, let it always be remembered, was a town of second or even third order, and in which it is now so easy to trace the almost painfully evident decline of the great art of the Greeks. For our part, we would much prefer, even if the excavations of Herculaneum involved much more time owing to the nature of the lava, than those of Pompeii, the inquiry in that direction than in the more popular city of Pompeii, because we have a stronger hope that in Herculaneum more treasures of an artistic kind are likely to be discovered. Especially, we are likely to find more works of art in bronze, that material in which all great artists have worked so successfully, and which time under almost all conditions has treated with so much tenderness that it is from the study of the bronzes of antiquity that we come nearest to a perfect knowledge of the art of the classic masters.

The bronzes discovered at Herculaneum have preserved almost precisely the tone and colour, the very surface,—the *patina*, as experts understand it,—that were seen by the great art-lovers eighteen centuries ago, a fact due to their preservation in the lava, which has in so many cases altogether left uninjured the surface of the bronze, while the chemical action of the cinders and boiling water poured down on Pompeii in the great eruption has not only corroded the surface of the bronzes there found,—so much so in many cases as almost to obliterate the form,—but by the corrosion has added a fictitious beauty, what one may almost call meretricious, in the fascinating tints of tender blue and green gradating into the richest tones of olive and purple.* The recently-discovered Faun,—to which we have referred,—is a splendid instance of this lovely colour caused by the conditions to which the bronze has been submitted: perhaps, beautiful as is this figure, it owes not a little of its charm to its present brilliant colour, which is, of course, altogether absent in any photographic copy, and which we find grossly exaggerated in most of those modern imitations which the French and other manufacturers have put into the market.

But apart from the fact that the bronzes found at Herculaneum have not, as we have above remarked, been submitted to this corrosive action, their artistic merit has been acknowledged to be of an exceptional nature, and yet a century and more has elapsed since the bronzes from Herculaneum, which form so conspicuous a feature in the Museo Borbonico, were brought to light. It will be seen that the artists who prefer that the energies and funds of the existing excavations should be directed towards Herculaneum have not merely conjecture on their side.

We gladly take this opportunity of mentioning the recent publication at Naples of a monthly review termed *Pompeii*, the aim of which, while amply suggested by the name, may be said to be somewhat more than a mere chronicle of the progress made in excavating Pompeii. In the programme attached to the first number of this publication, the director, Sig. Aug. Mele, set forth the intention of his journal to popularise and render industrially useful the science of archæology, at present too exclusively a subject of interest to a privileged few. By robbing it of the severity which is usually attached to its study, it is unquestionable that much may be done to spread in productive quarters the teachings that archæology regarded and pursued in the right spirit is capable of affording. This is to be more particularly the aim of the new publication; to render practical the archæological researches into the art of the classics, and in the several parts into which the publication is divided, "Industrial Archæology" is to take a large and important share. By the aid of careful illustrations,—in which the new photographic processes have been brought into requisition to reproduce the original drawings of the artists employed, a number of suggestive forms taken from the classic models found in Pompeii,—so rich in such models,—will be published to guide the modern designer and producer.

The field of suggestive ornament thus open to the editors is scarcely likely to be exhausted within a reasonable period. To all who are familiar with the treasures of what we should now call "industrial art," collected at the Museo Borbonico, the wealth of material will be remembered. In literally every direction, in every utensil and object for daily use, a due consideration to its artistic ornament seems to have been a *sine qud non* with the ancients; the rarest damascened silver work inlaid into bronze decorates the simple bed-head, the chair, and the litter; the keys found are in many instances richly damascened with silver, while not a vase or dish is to be found in the whole collection but what gives evidence of the minutest artistic attention. The distinction between the artisan and the artist was then well understood and clearly defined; in the case of a vase, for instance, if we mistake not, it was customary for the body of the vase to be the work of the artisan; its handles, and their mode of attachment, were left to the artist.

We have a strong belief that a renewed acquaintance with the treasures of classic art will be found to serve as a wholesome antidote to the recurring introduction of new fashionable "styles" and the sentimentalism of a certain kind of art about which we hear so much, and yet of which we so often find our friends expressing their weariness and impatience.

* This chemical action of the hot volcanic water on the works discovered in Pompeii, and which is entirely absent in those discovered at Herculaneum, enables even the uninitiated, when once informed of this fact, to judge from which city may have come the bronzes that are to be found in the museums of the world. Those from Herculaneum are black; those from Pompeii oxidised green. When these latter are of recent discovery, the oxidisation is of a beautiful deep blue colour, which, however, on exposure to the air slowly turns to green. It is needless to say that in the fabrications this blue is basely imitated, and never changes.

SOUTH KENSINGTON PRIZE DRAWINGS.

The annual exhibition of drawings and designs for which prizes have been awarded by the Department of Science and Art has been arranged this year in the south galleries (upper floor), adjoining the Horticultural Gardens. The drawings are not grouped so systematically as they might be, some classes of work being a good deal scattered. This applies especially to the architectural drawings, which seem to be hung in any corner where room can be made for them, instead of being grouped as one class.

It is, however, to these that we naturally look first, to see if any improvement has shown itself in this branch of the work of the Department, which has usually been very indifferent. There seems to be a little better work than in previous years, but that is not saying much. The gold medal for architecture is awarded to Mr. Herbert G. Smith, of Nottingham, for a design for a cathedral, which is illustrated by several elaborate drawings and a plan. The drawings show great industry and painstaking draughtsmanship, but they are certainly not remarkable as an illustration of modern Gothic design. The design is overdone with detail, wiry in effect, and wanting in real architectural solidity and dignity. No silver medal appears to have been given for architectural design. A bronze medal is awarded to Mr. Richard, or Richards, of Cardiff, for a design for a colonial town-hall. There are good points in the plan of this; the design is simply draughtsmanship, the repetition of thirteenth-century detail of French type. Mr. Price, of Nottingham, has a bronze medal for a cathedral design, which is "gim-crack" to a degree, and quite below the mark of what would pass as good at the Institute or the Architectural Association. There are a few very neatly-drawn designs for houses, each an imitation of certain accepted styles; some of them have the merit of being accompanied by plans. But the conclusion from looking at the architectural designs certainly is that the Department does not contrive to draw much architectural talent into its competitions. There are one or two careful bits of illustrative work; Mr. Pope's drawings from measurement of that curious piece of Gothic eccentricity, Cartmel Church, Lancashire, with its stumpy centre tower, with the bell-stage set diagonally on the substructure; and there are several tinted elevations from actual measurement of part of Greenwich Hospital, which speak well for the accuracy of the draughtsmen who measured and drew the building, for though by different hands, they are so precisely similar in appearance, and even in manner of shading, as to suggest at first the idea that they are multiplied copies of the same drawing. Mr. Woodhouse (South Kensington) takes a gold medal for studies and measured drawings of church porches,—a medal which seems rather easily won.

The drawings from casts of ornament are, in the best specimens, as good as work of this class could possibly be. The monochrome drawing of a piece of Roman ornament, shaded in sepia, by Mr. Marshall, of Chesterfield, for which the silver medal has been awarded, is a beautiful specimen of architectural detail-drawing; and we were much pleased also by the fine bold drawing in oil monochrome, by Mr. Stephenson, of Bradford (bronze medal), of a piece of acanthus scroll ornament, showing that the author fully understands the value of broad masses of light and shade on ornamental work of this class.

Turning now to the most important and difficult branch of all,—the drawing of the nude figure from the life, we find the gold medal for drawing awarded to Mr. Alfred Hitchens, of the South Kensington School, for a chalk drawing from a male figure holding a small sword, and in the attitude of a warrior disposed to conquer or die. The same model, in the same pose, is the subject of several other studies; the life-studies of this class appearing to come chiefly from South Kensington itself, or from Lambeth. We may, in the first instance, remark on the poor character of the models which these two schools seem able to procure, a point which we have noticed before. There is certainly nothing very inspiring, from an artistic point of view, in producing realistic copies of a figure which may be that of a most worthy and respectable man in his occupation, but which has certainly no form or comeliness that we should desire a repetition of his thin and scraggy outward semblance. We notice the same drawback in the other life-studies; short-legged and stumpy women, men of what is vulgarly called "pot-bellied" development, and so on. The practice in drawing is the same, in a sense, no doubt, but certainly the interest in drawing is not the same, nor the education of the eye and taste; and since it is unquestionable that better models than these are "in the market," we should have thought central schools like South Kensington and Lambeth might have afforded to procure them. Passing over this, we may say that the gold medal seems rightly awarded to this figure, which shows considerable freedom and mastery of drawing, and which we like rather the better that it is not overshaded and stippled like some of the others. At the same time, we have a most decided opinion that the lower leg, below the knee, is too long, especially in the right leg, unless the model was very abnormally proportioned; a comparison of the proportions with Professor Marshall's standard of the figure certainly bears out the opinion. The silver medal is awarded to Mr. Pearce, of Lambeth, for a rather weak study which has been overworked in the mere mechanical portion of shading and finishing. We have before expressed the opinion that both in the antique and occasionally in the life department, a good deal too much time is expended on this elaborate

surface finishing, which does not teach much. Miss Mary Drew and Miss Helen Jackson, both of Lambeth, take bronze medals for good drawings of the female figure, that of the latter especially, a back view study of the full-length figure, is a very good drawing. Miss Kate Evans (bronze medal) has a "time sketch" in crayon of a female head from life; but we are not told what the "time" was, which is certainly an element in judging of the merit of the result. The gold medal figure for oil-painting from the nude is better than any of these, and the result much more pleasing, the artist, Mr. Breakspeare, of Birmingham, having had the good fortune to have a fine figure with an expressive head to work from, to which he has done great justice both in drawing and colouring, and this may fairly be said to be the finest and most pleasing work in the collection. Miss Ellen Robertson, of South Kensington (bronze medal), has a good oil-painting of a head with a red fez, from life. The oil figure studies are not numerous, nor on the whole very noticeable, except the gold medal one. The figure studies from the antique are numerous and mostly very good, but too much care and time is bestowed on mere finish in shading. The authorities, however, do not seem to take this much into account in the awards, as the gold medal has been given, and rightly given, for a drawing by Miss Mary Surenne, of Edinburgh, which is less highly and smoothly finished than many of the others, but is more broad in style, and more correct and careful in the drawing of the extremities, than others in the same class of work.

The gold medal for sculpture has been awarded to Mr. Drury. This is called an honorary award, but we are not aware in what respect the recipients of honorary awards stand on a different footing from the rest. This is a seated figure, nude, of a man in the act of turning round, and half moving away as if startled by something. The extremities are roughly finished,—perhaps are not intended to be otherwise; but the general attitude and action of the figure show much energy and movement, and the arms are very well and freely modelled. The sculpture exhibits are not numerous. A silver medal is given for a cast of a caryatid figure for one end of a chimneypiece, which is very good, and well suited to its position; this is by Mr. Mark Rogers, of Lambeth.

Still-life studies in oil and water-colour are, as usual, numerous, and with a high average of merit. The gold medal for oil painting in this class is awarded to Mr. R. S. Morrison, of Liverpool, that for water-colour to Mr. Frank Suddards, of Bradford Grammar School; the latter shows some admirable work. But we prefer to turn to some of the examples of ornamental design, which deal with subjects more directly connected with our own. The gold medal for the Owen Jones competition is given to a design (for a carpet) by Mr. Gideon Fidler, of Salisbury, which is delicate and good in colour, but very deficient in design, consisting only of flower forms geometrically arranged, with no connexion or growth in the design, and the border, with its festoons hanging outwards all round, is very poor in taste. Owen Jones, we feel convinced, would have approved much more of the silver medal design, by Mr. J. H. Lamb, of Kidderminster, which is slightly raw in appearance in the colour as shown in the drawing, but is a very fine, rich, and original design of the true Owen Jones type. The gold medal for wall decoration is awarded to Miss Liberty, of Nottingham, for a good design in rather sombre colours. There are other designs very good in this class, but we do not impugn the award. The lace designs are many of them charming; we have always found them among the best things in the collection. The designs by Miss Mary Joyce, of Dover, for which the gold medal has been awarded, are very good, though we can hardly say they are superior to some others that are exhibited. Miss Joyce's designs, as well as a majority of those exhibited, are founded on realistic foliage. We doubt whether forms that are a little more abstract are not really better suited for lace. There are, at any rate, two very good ones, one of a rather Renaissance type, a curtain by Mr. Lawrence Kirk, of Nottingham (silver medal), which is very refined and well carried out, in the border especially; and another with a touch of Moorish feeling (the name of the author we omitted to note), which is very good; and there are other admirable specimens.

Among the remaining works are good designs for painted china plates by Miss Edith Robinson and Miss Alma Hodge especially; wall papers, which are very good, but which we cannot give space to particularise; a clever bit of original design for wrought ironwork by Mr. Albrow, formed from long reedy plant forms twined together, a trifle too naturalistic, but very suggestive and clever; some clever designs for mosaic floors, including an elaborate study by Mr. Stevenson for a floor founded on Celtic forms of ornament; an inlaid table-top design by Mr. Hayes, of Renaissance type of ornament, very good; and many other little bits of work which would well deserve praise if we had space to particularise them. In short, the department of decorative design seems in a very prosperous and encouraging condition; and if there is a certain amount of weak and uninteresting, or merely imitative work, there is hardly anything that is in bad or vulgar taste; and the mere fact that we can say this shows what an advance has been made in this class of design of late years. We should like to see a larger proportion of life figure studies of a finer type, and of original conceptions in figure subjects.

"SUGGESTIONS IN DESIGN."

The work published under this title* is an amplification of one published by the same author, under the *nom de plume* of "Luke Limner," in 1852–3; a good many of the sketches in the present work we remember noticing in the original one. The latter, we may frankly say, left on us the impression of a work showing some cleverness with a good deal of eccentricity, and with little indication of any serious aim. The present volume adds to the previously published "Suggestions" a considerable number of new ones, and a long and elaborate essay on ornament, dealing in a good many chapters with the respective characteristics of various styles of ornament, from the pen of Mr. J. K. Colling, whose own works, both in literature and in architectural design, have shown that he understands the principles of ornament. There is thus evidence of something like a serious intention in the work as now issued.

In his Introduction, Mr. Colling suggests, not without some truth, that civilisation has stunted what might have been the average power of drawing by the substitution of writing to express ideas, so that the mode of delineation generally distinguished as "drawing" has become in the scheme of education a secondary subject, not by any means to be taught as a matter of course, but only in exceptional cases, or left to be acquired by individual effort. Considering that writing expresses more complicated ideas, and expresses them with more completeness and certainty in general than drawing ever could, it cannot be doubted that writing is the more urgent necessity of the two for the conduct of life. But it is well to remember that in some ages and countries much less cultured than our own, a higher general power of drawing was attained than is possessed among us now, simply owing to the fact that it was a recognised method of communicating ideas, and as such was generally learned and practised. There is no doubt that if drawing were made as essential a part of primary education as writing now is, and if failure to acquire any command over it were regarded as a failure to be rather ashamed of, as it is in the case of writing in schools, there would be an astonishingly larger percentage of persons who could draw fairly than there is to be found among us at present. As it is, it is never expected that any one, because he is an educated man, should therefore be able to draw even the simplest object, or should evince even the most rudimentary notions of perspective. If he does so, it is a feather in his cap, and he is a kind of marked man among members of ordinary society; if he does not possess the least vestige of the power no one expects, or feels entitled to expect, it of him. Now, as it is perfectly certain that the vast majority of people can learn to draw if they are taught, it seems absurd that we should have this state of incapacity to handle a pencil so prevalent among us, and that we should see an otherwise cultivated and clever man so hopelessly at a loss if, on some unwonted occasion, he attempts to express with a pencil his recollection of the form or construction of some object which he wishes to describe. Nothing is more ludicrously painful than the hopeless "dash at it" which such a man makes with a pencil when he ventures to attempt the use of one; scribbling at random on the paper in search of the lines which would express what he wants, but which he cannot stumble on. A very little direct education in the matter would probably have taught most of these bewildered ones, if not to originate design, at any rate to know how to reproduce a form on paper correctly; and when the time comes when drawing is recognised as a proper branch of liberal education, probably even those who advocate it may be surprised to find how much can be done by the majority when they are once persuaded that the art, up to a certain point at least, is as easily acquired as a good many other accomplishments which are not considered extraordinary or out-of-the-way achievements for people of average talents. We have been saying this for many years, and a belief in the truth of it is slowly growing.

This, however, is by the way, Mr. Colling's remark in his Introduction having set us off on a subject we are at all times eager to recommend to public consideration. Turning to Mr. Colling's "principles of design," which are stated in a tabular form in the next chapter, we find ourselves in agreement with nearly all of them, but not always with the reasons given for them or with the comments added to them. There are some, however, which are to be noted because they are not so often insisted on in theory as others, and are constantly broken in practice. For instance, that "ornament in relief should not be added to or overlaid upon the construction. . . . . For example, wreaths and festoons are frequently placed so as to hang over arches, mouldings, and other enrichments. They are thus separate from and added upon the construction, and therefore, never aid the beauty of a work." This has been long recognised in theory in regard to the addition of useless architectural features, but the very architects who would avoid adding a sham buttress or a sham turret with the idea of ornament, do not scruple to overlay a building with impertinent ornaments which have no relation whatever to the constructive design of the building, and this fault is just at present absolutely rampant among us. Again, "all ornament should be taken or worked out of the solid material, not added upon it. . . . . In wall surface, the carved enrichments should be taken out of the wall, not added to it;" a maxim the truth of which will be intuitively felt by every one who has a grain of innate perception of the fitness of things, but which is frequently ignored by people who are supposed to represent artistic culture, and who, therefore, might be expected to know better. In illustration of the axiom that "all ornament should be subordinate to the subject ornamented," Mr. Colling gives the very apt illustration of the class of carved sandal-wood boxes so familiar to students of Indian art, in which, as he says, the form of the box is not in any way altered by the vast amount of ornament carved upon it. But when the author repeats the axiom, before laid down so strongly by Owen Jones, that "all ornament should be founded on a geometrical basis," and adds that "this is a natural law which may be found in nature by study and observation," we must differ from him. It is found in nature, undoubtedly, but by no means with that frequency and regularity which would justify us in speaking of it as a natural law. And, in fact, the implied necessity of going to nature to justify everything we do in ornament argues a mistaken view of the subject. The principle which is followed out in the geometrical spacing of ornament is one which has its root in metaphysics, not in natural forms at all. Ornament is the arrangement and treatment of forms which may or may not be derived from external forms in nature, according to laws which are very deeply seated in our conceptions, but which are based on metaphysics, on the abstract proportions and relations of numbers and geometry, not upon the habits of nature as illustrated in her visible and palpable growths. Besides, in laying down such a rule as this, although we hold it to be in the main a perfectly sound one, there should, at least, have been some hint of the fact that there are schools of ornament which have come in for much admiration of late, in which geometrical spacing is

* Suggestions in Design, being a Comprehensive Series of Original Sketches in Various Styles of Ornament, arranged for Application in the Decorative and Constructive Arts. By John Leighton, F.S.A. With descriptive and historical letterpress by James K. Colling, F.R.I.B.A. Blackie & Son: London, Glasgow, and Edinburgh (no date).

palpably and almost studiously ignored. We are of the opinion, which we have several times before expressed, that Japanese ornament, the principal representative of this non-geometrical school, is much over-rated at present; but still it is far too important a fact in ornament to be ignored. (It is not ignored in the illustrations, but it is, apparently, in the "principles.") Besides, without going to anything so lawless as Chinese and Japanese ornament, we find even in Indian ornament, in embroidered stuffs especially, the most beautiful floral combinations which are sufficiently conventionalised to come under the head of ornament, but which, nevertheless, show little if any adherence to geometrical spacing. Again, when it is said that decoration should not be shaded to imitate work in relief, though we entirely agree that it should not, there ought to have been some recognition, by way of a note, of the fact that a large school of painted ornament in the Renaissance period, having some remarkable merits of its own, is worthy of admiration in spite of its undoubted impurity of taste in this respect. Then, in saying that some colours in different tones may be used one upon another, as light and dark chocolate, it is superfluous in any case, and not quite correct, to instance as an example of this in nature the differing tones of the fronts and backs of some leaves, &c. We do not go to natural facts such as these for authority for the arrangement of colours in decoration, any more than we go to natural sound for an authority for the combination of musical sounds. It is a question half of reasoning, half of the education of the eye, and combinations of colours may be very harmonious and very pleasing in effect in decoration, of which we do not find any examples in nature. Both the design and colouring of ornament, in fact, though in both we may receive and adopt hints from nature, are in reality matters of art, and of thought, and artistic perception,—not of imitation of nature. "The primary colours,—red, yellow, and blue," —ought hardly now to be referred to without a hint that the most recent theory has altered the conception and nomenclature of primary colours, nor is it quite safe to say that, in ornament, these so-called primaries should "always" be used sparingly, and in small quantities. This looks like a repetition of the doctrine of Owen Jones, who was very positive on this matter. It is a rule that generally may be followed with advantage, but there are and have been brilliant exceptions to it, producing very bold and fine results. Look at the masses of red in Pompeian decoration, for instance.

In giving an analysis of the various schools of decoration, Mr. Colling looks at his subject very much from an architectural point of view, and connects the changes in taste in regard to ornament very closely with the architectural style of each age and country. This is reasonable to a great extent, no doubt, and a very natural way for an architect to look at it, but still ornament, even when connected with architecture, has an independent life, as we are reminded in finding, as we sometimes do, ornaments of such very similar type in connexion with perfectly distinct and differing architectural styles. The analysis of the styles of ornament contains no new suggestions, as far as we observe, nor, we must say, is it presented in such a manner, speaking from a literary point of view, as to bring out the interest of the subject very fully; but it offers a useful *resumé* of the leading characteristics of the different styles of ornament. We observe that in speaking of Moorish ornament Mr. Colling says that the designers of this school used the primary colours on upper portions of objects, placing blue in the shade, and gold on objects exposed to light. Blue in the shade is certainly not an invariable rule, for there are specimens of Moorish ornament in which the strap work separating the interspaces, and standing in relief above them, is blue.

A chapter is given on floral decoration, which Mr. Colling made a special study of a good many years ago, and on which he speaks with the authority of one who thoroughly understands his subject. This is the most useful of all the literary portion of the book. But we must say a few words as to the practically illustrative portion of the work. The reader must not rashly suppose that because he sees the words "Greek," "Roman," &c., at the heads of the pages, the examples given are *bonâ-fide* specimens of the ornamental art of the nation indicated. They are specimens of design by the author, following the principles of the various schools of ornament named, and, in fact, embodying suggestions in regard to the further development of the types most characteristic of each class of work. This, it will be seen, is a very ambitious motive to adopt, and, at the same time, it is one of which we can hardly see the object. If the author were a young designer of ornament, working to bring himself into notice professionally, we could understand the object of the publication; but that is not the case, as far as we know. The value of the suggestions must lie, therefore, in their "suggestiveness,"—strictly speaking, in their power of setting other designers thinking on the possible development of existing types. And we fear their value in this way is not very great, and that most people who are capable at all of working out suggestions of this kind to good purpose, and to the production of anything really beautiful and original, would be more likely to do so by reverting to the original types and starting fair for themselves than by following Mr. Leighton's rather eccentric suggestions. We should be very glad to speak more cordially of the book, for it represents a great deal of work, and there is a good deal of originality of a rather queer sort scattered about the pages; but "there's where it is,"—it is mostly more or less queer, and we hardly know in many cases whether to think the author is joking or not. The author does not catch the real spirit of the styles he professes to suggest upon in some cases; certainly not in the pages called "Gothic." The book is rather amusing to turn over, and here and there we may see a suggestion which it would be worth while to turn to account in a rather better way than the author has done. But in the main we fear we must describe them as designs evincing a certain cleverness with a want of refined taste, which occasionally merges into vulgarity, artistically speaking. It must be admitted that to carry out such a scheme as this at all so as to make it of any real value would be very difficult, and would require very high powers and very cultivated taste, and these Mr. Leighton can hardly be said to possess, if we are to take these designs as a fair indication of the extent of his talent. We are disposed to think the work will be chiefly used as a sort of pattern-book by that class of ornamentalists in various departments who look out for forms ready to their hands.

PROGRESS AND PROSPECTS OF ELECTRIC RAILWAYS.

The electric railway, we hear from Berlin, is there proving to be so great a success, that it is already in contemplation to apply the same mode of moving trains to the St. Gothard Tunnel, and to the Metropolitan Railway.

With regard to the St. Gothard Tunnel, it may be presumed that the coast is tolerably clear, and that if it can be shown that electric propulsion is, all things considered, likely to prove the best and the cheapest, Messrs. Siemens, on the one hand, and the directors on the other, will thrash the matter thoroughly out.

With regard to the Metropolitan Railway, the case is different. There all the arrangements are made, and are in excellent working order. More than 400,000*l.* have been expended on working stock. Not an interval of five minutes during eighteen hours out of the twenty-four passes without a train running over the rails. Before, then, any question can be raised as to change in system here, two things are requisite. First, the electric system must be shown to be as reliable and as manageable as the locomotive system; secondly, it must be shown to be considerably cheaper.

We are not advancing this statement with the view of throwing cold water on an invention which, if fully successful, will be a success of a very high order. We are only desiring to direct into the groove of practical inquiry that energy that may otherwise be wasted in vague and profitless speculation.

As to the first point, the practical working of the line, we have nothing at the present time to say. Details will, no doubt, be forthcoming, and if they prove satisfactory, experiments will in due course follow, made on some branch line or short portion of railway, where positive results can be obtained without interfering with actual traffic. We mean, of course, in this country.

What we wish to discuss is the limit of possible advantage, or the reverse, in a pecuniary sense, to be derived from the substitution of the electric motor power for the heavy locomotives which now propel the trains of the various subterranean railways through the metropolis.

On this highly-important subject we should be able to speak with more precision if the official returns of the English railways furnished the details of work actually done in the conveyance of traffic, which are necessary in order to inform the shareholders of what part of their business does, and what does not, pay. But notwithstanding the persistent refusal of this information, we are able, by working from the details given by the directors of foreign and colonial lines, at all events to lay down certain limits within a trifle of exactitude.

The average cost of moving 100 tons of loaded train for one mile on the railways of the United Kingdom in 1879 we estimate at 20·76 pence, out of which 5d. was the cost of locomotive power alone. From the data furnished by the Blackwall Railway we arrive at the conclusion that out of this 5d. per 100 tons taken one mile, 4d. was expended in moving the locomotives, and 1d. in moving the train. This 4d. per 100 tons per mile, or approximately per train mile, is therefore the limit within which any possible saving must be confined.

On the Metropolitan lines, however, the cost of locomotive power is greatly increased by the frequent stoppages, the high speed which it is necessary to get up between the stations, and the tearing action of the brakes, alike on the engines, the trains, and the rails. We think it will be found that it would not cost more for locomotive power and maintenance to run a metropolitan train for twenty-four miles straight on end without stopping, than to run the usual stopping train from Moorgate-street to Praed-street. Thus while, owing to the good loading and the consequent low tare, the Metropolitan lines are worked at a lower percentage on their receipts than any other in the country, they cost more per mile per 100 tons than any other. The great weight of the engines, which is a necessary consequence of the high speed and numerous stoppages on the Metropolitan lines, is such as to bear a far higher proportion to the weight of the carriages than would be otherwise needful. An estimate which we made on the best data accessible in 1875 gives a cost of 45·7 pence per 100 tons per mile, or about 2¼ times the average of the English lines. For locomotive power, maintenance, and repairs, alone, the cost was 17·9 pence against 11d. on the average of the United Kingdom.

For maintenance and repairs, on the average of the United Kingdom, as aforesaid, the cost is 6·6d. per 100 ton miles of load conveyed. This is only 1·2d. per unit more than we arrived at for the Metropolitan line. We thus have a cost of 11·3d., for locomotive power and excess of charge of repairs, on which saving would be effected if it became possible to substitute the cheapest mode of applying power hitherto indicated for the locomotive. And if we take the resistance cost (or lowest ascertained cost), at 1d., there is a margin of 10·3d. per 100 ton miles out of which saving is conceivable. If we roughly allow the Metropolitan and Metropolitan District trains to average 100 tons each, load and all, a saving of 10d. per train mile would amount to more than 70,000*l.* per annum, or to an addition of 14¼ per cent. on the net profits of the two lines.

By the test of reduction to £. s. d., therefore, the conceivable saving to be effected by the replacement of the locomotive by electric propulsion is one of a magnitude well worth the attention of mechanical men, as well as of the engineers and managers of railways. Attention, of course, will be first given to those lines in which it is desirable to escape from the nuisance caused by the products of combustion. Through a long tunnel, if the passage of the locomotive could be avoided by any means that did not either reduce the certitude or increase the cost of the transit, a considerable advantage would be assured. As to the Metropolitan lines, the special cost of the sudden starting, high speed, and sudden stopping of the trains is such that the advantage of doing without a locomotive would be considerably more than on ordinary railways. There is this to be urged in favour of experiment with a view to decide these points that we have named as open, that just where the advantages of superseding the locomotives would be the greatest, the margin of possible saving would also be the greatest. That so much, or that any, saving is yet shown to be possible we do not say, for we do not know. But there is a great presumption in favour of prompt and exhaustive inquiry.

THE LATE MR. SAMUEL SHARPE.

The announcement of the death of Mr. Samuel Sharpe suggests to us many personal recollections of the laborious old Egyptologist. The comfortable old-fashioned residence long occupied by Mr. Sharpe at Highbury dwells in our recollection as one of those English homes of which our country has so much reason to be proud. Mr. Sharpe's long connexion with the old bank with which the poet, Samuel Rogers, was associated, and his immediate relationship by marriage with the family,—his wife was the sister of Rogers,—and Mr. Sharpe's great love, not alone of literature but also of art, possessing, as he did, a very thorough conventional acquaintance with its history and traditions, made his house a well-adorned receptacle of cherished memorials, not like the house of his brother-in-law in St. James's-place, not containing such famous treasures of art as that well-remembered house, but smaller objects, not necessarily of less interest because of less value, but such objects as the affectionate regard for beauty and historical interest give invariably to more than usually interesting surroundings.

Notwithstanding Mr. Sharpe's age,—he died at eighty-three, having outlived most of his beloved acquaintances, — he has left many friends to lament his loss, not alone in England, but abroad and in America, where, indeed, in certain circles his name is perhaps better known than even here. Mr. Sharpe's literary productions were numerous; his "History of Egypt" was published now more than forty years ago. His studies were almost invariably connected with Biblical literature and history, and in all instances involved an amount of laborious inquiry that his methodical habits acquired in business made comparatively easy to him.* His revised edition of the New Testament, translated from the original Hebrew, preceded by some time the recent much-talked-of edition, and to students is worthy more attention than it has so far received. Mr. Sharpe's munificent donations to the London University and School made him one of the strongest pillars of that institution, as he also was of the Unitarian denomination. His private charities and genial character made him beloved by all who knew him.

THE WATER SUPPLY DIFFICULTY.

The unusual drought of July, 1881, has been due to the concurrent causes of a very slight rainfall, and a very high evaporative power. What the combined efforts of the two have been over torrential districts (that is to say, over impervious soils, which afford no storage for rainfall), is illustrated by the portentous statement that the River Graveney, draining an area of about 8¼ square miles, chiefly of impermeable London clay, which, on the 10th of October last yielded, on an average of twenty-four hours, 9,507 cubic feet of water per minute, yields at the present time only 4 ft. per minute! We hesitate even to quote such a statement, and only do so on the responsibility of such a well-known writer on sanitary engineering as Mr. Baldwin Latham.

Mr. Latham, however, is of opinion that there is no immediate danger of a failure in water supply in the great geological water-bearing strata of the country. It is rather early days, considering the unprecedented rainfall of the last decade, to talk about running short of water after a fine July, chequered as the weather has been by heavy thunder showers in many parts of England. But Mr. Latham says that the springs are falling at a much more rapid rate than at the same time last year; and that all streams deriving their supply from surface sources are at an extremely low point. In the red sandstone formation in the central parts of England the water is abundant, but in the oolite formation round Northampton there is a deficiency. Important facts of this nature should not be left to the detection of private professional men. The mere statement is enough to show how deeply we may hereafter suffer from the absence of a scientific department which should watch and give account of the state of the natural and ever-varying water stores on which the welfare of the country depends.

Another matter of great importance in a sanitary point of view is brought forward by Mr. Latham, as to which we shall be glad to receive the testimony of medical authorities. It is the statement that "there is the strongest evidence to show that diarrhœa is produced by the use of water at a temperature of 62°." As a simple statement, we apprehend that the above sentence, as it stands, is incapable of defence. But that it may include, or point to, a truth, seems to us to be indicated by the experience of Mr. Aitken, who opposes the statement of Mr. Latham. We doubt very much whether there is so large a use of water made for drinking purposes as is assumed; that is to say of water as drawn from the cistern. Between the use of beer and other artificial beverages on the one hand, and that of boiled water on the other, we should think that the drinking of simple water at 62° was the exception rather than the rule. However that may be, it is possible that, although the temperature of the water drunk is indifferent to the consumer, the rise of the temperature of masses of water to a given height may be accompanied by an indication of fermentation, confervoid growth, or some other induced condition unfavourable to health. And this, no doubt, is intimately connected with the character of the gathering grounds. At the Bombay Waterworks, says Mr. Aitken, "no men or animals are allowed to live on the gathering grounds, and there is no diarrhœa attendant on the consumption of the water." Nor is it a mere matter of expression with which we have to do. Mr. Latham holds that in those districts of the country which take their supply direct from wells, the water of which is of a low temperature at this season of the year, diarrhœa does not become epidemic. Mr. Aitken, on the contrary, holds that the prevalence of diarrhœa in a part of London supplied by the Kent Waterworks is due to the use of impure water from wells. Our own view, on the first aspect of the case, is that temperature, as such, is wholly unimportant; as, for instance, if boiling water be added to pure ice till a temperature of 62° is obtained, we should expect the water to be perfectly wholesome, though tepid to the palate. On the other hand, that impurities contained in either well or river water may develop a poisonous activity with a given rise of temperature is quite conceivable, and any good observations on that point will form a valuable addition to our sanitary science.

As to the remarks which we made with reference to the extra stress thrown upon some of the metropolitan water companies by the hot weather, they have received a very full confirmation from a letter written by Messrs. Joseph Quick & Son, of 29, Great George-street, Westminster, who write as having been for many years officially connected with the management of an important portion of the London water supply. During the year ending the 30th of June, 1881, the average daily supply of London has risen to 145,732,116 gallons. But during the month of June, the supply actually reached 162,305,736 gallons per day, or nearly 20 per cent. above the yearly average for 1877. As compared with the daily supply of last December, the supply in June shows an increase of 27,594,892 gallons, and the supply of one of the West-end companies on the 20th of July reached the extravagant and wasteful amount of 45 gallons per head of the population of the district for that day.

These facts do not more thoroughly substantiate the remarks we made on the subject than do the experience and candour of the writers support the opinions we have so often expressed as to the points where the main evils in the present system are to be detected. "The public have yet to learn," say Messrs. Quick, "that not only the suppliers, but also the recipients of the water, have essential duties to perform in connexion with the supply." The Parliamentary powers of the companies are not such as to allow of such adequate inspection on their parts as should prevent either waste or negligent and unsanitary pollution of the water in the house-cisterns; which, as a rule, are to be found in those very parts of the houses from which they ought to be as far as possible removed. "Things must, therefore, take their course until a metropolitan water authority is created, armed with sufficient power to act vigorously in the organisation of domestic and other water supplies, and compelled to exert its authority stringently, in order that the entire population may realise the full advantages of the supply, and no one be allowed to prejudice his neighbour's water rights by abusing his own."

The last sentence of this instructive letter might almost have been copied from our own columns. "The recent accident to the main of the Grand Junction Company which resulted in so much inconvenience to the tenants affords an apt illustration of the disadvantage of the present system, and of the advantages which would result from unity of management, and amalgamation of the various companies' works; for under the latter arrangement connexions could be made between the various works, and the mains of one district would be available for the supply of another in cases of emergency."

THE TRADE IN INFERNAL MACHINES.

Amid the unmitigated detestation which has been excited by the discovery of the long-laid plans of murder which have been brought to light from the holds of the *Malta* and the *Bavarian*, there is at least one ground of satisfaction. So far as is yet known, no British workman has been found ready, for any bribe, to lend his honest skill to the service of wholesale murder. That in so dense a population, where engineers and men of mechanical knowledge are relatively so numerous, and when trade, including their trade, is so slack, this is, indeed, matter for no small congratulation. Considerations of personal safety, indeed, may have induced the cowardly purchasers of these infernal machines to procure them in a foreign market, rather than to attempt to tamper with, or even to outwit, a needy English mechanic. But this supposition very little alters the aspect of the case. Whether the sneaking conspirators against society tried and failed to procure tools for their nefarious designs on English soil, or whether they were afraid to try, comes to much the same thing, as far as the credit of the English mechanic is concerned. Long, long may it remain so!

It can scarcely, we fear, be doubted that the events of the last eighteen months have but too much familiarised the public of these kingdoms with the accounts of deeds of murder, arson, and mutilation. The reprobation which is felt for such crimes is not less in any upright mind. The kind of horror which each new instance elicits may be less marked, but only so because the sense of surprise arising from utter novelty is dimmed. And while this is the case more or less with the best of us, what is likely to be the effect on the more ignorant and dangerous classes? No ugly phenomenon is more certain than the fact that crime, and more especially prodigious crime, tends to produce crime. It is as with some noxious weeds, which fill the neglected soil with their self-sown seedlings. One of the great arguments against public executions was the manner in which the visible exercise of violence against human life brutalised the spectators. The worse, rather than the better, elements of our nature are galvanised into abnormal exercise by sights of violence. And it is, in the same way, although (as Horace long ago pointed out in a less vivid manner), that the recounted details of crime tend to dull the sense of horror.

How the intelligence was brought to the ears of the Home Office, those who best know will be the last to tell. It is a matter for satisfaction that, as far as the *Malta* and the *Bavarian* are concerned, the news was given in time. But none of us ought to forget that the cunning of the murderers, shown by the actual despatch of two cargoes of barrels of cement, each containing a deadly consignment, marked by an inconspicuous sign, is hardly likely to have been detected in a first essay. It will be well to ascertain at Liverpool, at London, and at our other ports, whether consignments of cement, or of any articles out of the usual course of trade, have of late been received from America. As to the search that should be made for the consignees, it is needless for us to insist upon that.

The discovery of this diabolical plot, and more than a plot, as it involves the carrying out of the murderous design through the two distinct stages of the construction of the machines, and of their despatch to Liverpool, leads us to repeat the warning which we gave on the occasion of the less deliberately-prepared outrage at the Mansion House. It is this. In times of public danger,—and that we live in such times who can deny?—it is the duty of every good citizen, of every honest man, of every observant lad, to act as a self-constituted detective on the part of society. As a rule, it is almost impossible for

* Only as lately as to the *Athenæum* of July 16 last, Mr. Sharpe had contributed an interesting letter claiming for the Egyptian astronomer Ichonuphys the invention more than 300 years before the Christian era of the Leap-year.

any great mischief to be prepared without some sign. Something unusual is almost certain to occur: something to betray to the experienced eye an irregularity, an incongruity,—a need for explanation. The despatch of an article of the low value of cement from the United States to Liverpool was a case of this kind. To nine people out of ten no ground of suspicion would hence arise. But to the cement maker or seller, to the builder, the architect, the shipper, the carrier, the question would naturally occur,—"How is it that cement is consigned to Liverpool from the United States?" And with one or more of these specially informed people the consignment was sure to come in contact. "Who," they might ask, "is the consignee? What has he to do with American cement?"

This, of course, is easy to say now. But the need of vigilance cannot be too much insisted on. And as encouraging the watchful it is that we call attention to the unconscious warnings that treason is so wont to give. A spider's web saved the Bruce. The keenness of observation and inference that argued from the presence of the web that the cave was empty, was at fault in that memorable instance, as is usually the case when slight indications are relied on with the result of saving trouble. On the other hand, when a true and anxious vigilance is awake, no hint so slight but that its careful pursuit may lead to the saving of valuable life,—to the safety of a vessel or of a public building.

Since we wrote the above, it has been stated in the papers that "cement" had been received from America at Liverpool before the arrival of the *Malta* and of the *Bavarian*, and landed without examination. The strong effort which has been made to show that these deadly consignments were only intended as a scare, should be read by the light of that statement. Vigilance is imperatively demanded. The consignments which have actually passed the Custom House ought easily to be traceable by the police.

New York papers of the 29th of July state that a reporter of the press claims to have discovered that the infernal machines seized at Liverpool were made at Peoria (Illinois), and accuses the director of the Association of United Irishmen residing in Peoria of being connected with the conspiracy.

THE ABBEY YARD, WESTMINSTER.

Those, if such there be anywhere, who are contented with the present squalid and indecent state of the churchyard of St. Margaret's, Westminster, and of the dreary swamp (in wet weather), half paved with dishonoured gravestones, which form the foreground to the prospect of Westminster Abbey, as viewed from the north, will not be found among our habitual readers. That an effort is being made to remove this discreditable eyesore all persons of taste will rejoice. Our first suggestion must be not to overdo it. As to this, the very modest sum now asked from the public, 2,000*l.*, to place alongside an equal contribution already promised, is to some extent a guarantee against too much decoration. The great points to be borne in mind are, walls that shall protect without disfiguring, the area included, and sweep of fine turf, relieved, but not overshadowed, by shrubs, and sparkling, here and there, with flowers. We very much doubt whether evergreens should be planted in the area. Amid the dense impurities of the London air, vegetation that springs new from the soil in spring, and that fades before the alternating frost of winter, has a great advantage over permanent shrubs and trees, that are ever adding to the incrustation produced by the smoke and other products of combustion, on their trunks and limbs, and that never shake off the sickly paint. This, of course, is mostly the case with those very trees of which the appearance is the most picturesque in the winter. It is also the case with our forest trees,—the elm, the beech, the oak. It is true that they assert their own chartered rights to display lovely and tender foliage in the opening year. It is true that the leaves do not become wholly black before they would otherwise become brown. But the trunks and branches do. Large trees are not at home in London, nor likely to make themselves permanent guests, until we lessen the smoke. Even in the beautiful grounds of Chiswick House, where an area of real park yet resists the flood of cottage building that surges round the ducal boundary, the old cedars and pines are fading. The highest botanical authority in the country is under the apprehension that the decay cannot be arrested, and that trees on which Linnæus looked with admiration are yielding to the slow poison of the London atmosphere.

For trees, then, if trees must be had to relieve a broad sweep of turf with a bold hedging of shrubs, we recommend the landscape gardener of Westminster to study the best forms of the larch. This tree shares with the pine the advantage of bearing needle-like leaves, less likely to contract atmospheric contamination than the broader, softer, and more destructible foliage of our deciduous forest trees. And as it sheds its spines in the winter, it is likely to preserve greater foliage and vigour than any of the evergreen gymnosperms.

It is to be regretted for many reasons that the culture of the yew is now so much neglected. The yew is indigenous to the chalk downs of England. Its slow growth renders it so unproductive as a timber tree, that its encouragement, when England depended on the bow for defence, was made the subject of legislative action. Hence the presence of the yew in so many churchyards. With regard to the influences of London smoke on the yew, we cannot speak so definitely as we could wish. That the tree becomes frightfully black when growing near large centres of smoke, we well know. That it may preserve its vitality, in spite of its griminess, is possible. The juniper is another indigenous evergreen of extreme beauty. But we imagine that the juniper refuses to live in towns. The most graceful of this group of shrubs, the tamarisk, certainly does. We commend to the expert the question of larch, yew, or juniper for plantation in this venerable God's acre. We hope by next year to see level and well-shorn turf, and small beds of brightly-flowering plants,—no carpeting or formal "bedding out,"—covering a site so rich in proud memories, and now such a disgrace to the metropolis.

THE "SEBASTIAN DEL PIOMBO" OF THE NATIONAL GALLERY.

We spoke not long since* of our confidence that, in the hands of the present Director of the National Gallery, the "Sebastian del Piombo" would not be likely in the course of its restoration to receive the smallest injury. We were delighted, on visiting the Gallery the other day, to find our confidence fully justified, the grand old picture revealing more than ever its brilliant power and beauty. The "Raising of Lazarus" is not the only picture in our national collection that has gained much by the attention bestowed on it during the careful custodianship of Mr. Burton, and it is impossible, when we see the admirable condition of so many of our pictures and the care and thought bestowed upon them, to resist a comparison with the state of many of the great treasures of the national collections abroad. It may be that there exists a conviction in the minds of Continental custodians that it is dangerous to meddle in any way with treasures such as they possess, and we cannot but sympathise to some extent with this fear. At all events that appears to be the only excuse for the look of decay, of decomposition even, that appears in progress on the surface of several pictures in the collection of the Louvre, notably in the rare and famous picture the "Fête Champêtre," by Giorgione, in the "*Salon Carré*." This picture presents a crumbling and slightly shrivelled appearance, the very reverse of what some people object to in the condition of our pictures, of being over-varnished.

There exists, it cannot be denied, a thoughtless, and, in some measure, a species of traditionary, system of decrying and abusing all restoration. Restoration in the case of old pictures, as of our great monuments, is absolutely necessary to preserve them from certain destruction in a more or less distant future; restoration, that is, of a preservative nature. It is to the care of the Louvre authorities that we owe the preservation, the very existence almost, of the "Marriage of Cana" by Paul Veronese. This picture, one of the first Napoleon's spoils from the Italian campaign, was in too dilapidated a condition at the time of the restitution of the rest of the Paris treasures to their respective countries, to make it worth while for the Austrians to transport it back to Venice. The huge canvas was, in fact, what the French understand by *hors de service*, and for forty years it remained in this state. Some years since the Louvre authorities boldly undertook the task of re-lining the ragged picture, and now the "Marriage of Cana" shines out, as it will for many a generation to come, the most brilliant item of the jewel-case of the French national collection. This we owe, as we do in many other cases, to intelligent restoration conducted under the eye of competent directors.

* See p. 38, *ante*.

IMPROVEMENTS AT IPSWICH.

NEW LOCK GATES, POST-OFFICE, AND MUSEUM AND SCHOOL OF ART.

Ipswich was *en fête* on Wednesday in last week on the occasion of the opening of the new lock-gates, the new Post-office, and the new Museum and School of Art.

The Lock Gates.—The Ipswich Wet Dock, to which the new locks are constructed to give improved access, dates its existence from the commencement of the reign of our present Sovereign, the first Ipswich Dock Act, under which Dock Commissioners were elected, and powers given them to make a dock, having received the royal assent on June 30th, 1837, during the early days of her Majesty's reign. It is now about ten years since the desirability of constructing a larger entrance began to be considered. The subject first came up at the general meetings of the Commission till the General Committee of Management were instructed to give their attention to it. At the July meeting of the Commissioners in 1872 the committee first reported in favour of a new lock entrance, which they suggested should be from 250 ft. to 300 ft. in length, 50 ft. to 55 ft. wide, and with a depth of 25 ft., subject to the advice of an engineer. They recommended that Mr. J. F. Bateman, C.E., F.R.S., should be consulted. Their report was adopted, and the chairman of the committee (then Mr. J. C. Cobbold), Mr. G. Mason, and Mr. R. C. Ransome, were appointed a sub-committee to confer with Mr. Bateman. In the following October Mr. Bateman submitted a comprehensive report, in which, after reviewing the past history of the port, and, considering its then condition, he sketched out a plan of works which he was of opinion would convert the dock and harbour of Ipswich into a first-class port. He proposed a new lock 300 ft. long between the gates, 50 ft. wide, and with a depth of 23 ft. 6 in. at high water spring tides, which is the work now completed, and in addition he proposed, acting upon a suggestion from Mr. George Mason, an embankment, with weir and sluices, across the southern end of the New Cut, which would give an additional dock area of nearly 20 acres, and, with a swing-bridge over the lock entrance, afford an opportunity for increased railway communication by means of the present line to the Griffin Wharf. He also suggested improvements in the channel of the river, and his total estimate, including 10 per cent. for contingencies, was 109,560*l.* A portion of these works, it was clear, could not be constructed at once, for a great deal of the sewage of the town was daily passing into that portion of the Cut which it was proposed to dam up, and Mr. Bateman's proposals having been referred to the Committee of Management, that body recommended, in November, 1872, that if 60,000*l.* could be raised, it was expedient to apply to Parliament for powers to construct a new entrance lock. Opposition to the scheme caused it to remain in abeyance until September, 1875, when Mr. Thomas Miller, C.E., the Commissioners' resident engineer, suggested a modification of Mr. Bateman's plans by placing the proposed dam across the Cut above the present lock-gates, with gates to connect St. Peter's Dock with the dock, and, after consulting Mr. Bateman, the committee adopted Mr. Miller's proposal, and recommended application to Parliament for powers to carry out the whole scheme so modified. This report was adopted, after three hours' discussion, by a majority of one,—twenty to nineteen, and the usual Parliamentary notices were given. At the July meeting in 1876 the committee recommended the construction of the lock entrance and other works, the Corporation being asked to guarantee the payment of the interest. The report was adopted by a large majority,—thirty-one to eight, and the Corporation subsequently agreed, under conditions, to give the guarantee asked for. Application was made to Parliament in the ensuing session, and the Bill met with no serious opposition, but when it came before the

House of Lords the Chairman of Committees, Lord Redesdale, refused to sanction the clause containing the Corporation guarantee, and that part of the Bill had to be abandoned. That, however, was not allowed to extinguish the enterprise which has now been carried so far towards completion. The Bill empowered the borrowing of 80,000*l.*, secured upon rates to be imposed on all goods imported or exported, of which 50,000*l.* has been raised, to be repaid within eighty years. That portion of the works, the completion of which was celebrated on the 27th ult., consists of the lock entrance, and the works necessary to enable it to be used. The lock, as we have already said, is 300 ft. long between the gates, and it is 403 ft. over all from pier to pier; its width is 50 ft., and at high water on an ordinary spring tide there is a depth over the cill of the gates of 23 ft. 6 in. The approach from the river to the lock, for about a quarter of a mile, has been dredged to a depth of 22 ft. at high water spring tide, and will be further deepened in course of time, but the full benefit of the increased depth at which the cill of the new lock is laid will not be felt until the river for a distance of about three miles down has been dredged to a corresponding depth. At present the upper part of the river is adapted to vessels drawing 18 ft. of water, but at Butterman's Bay, where larger vessels have been in the habit of lightering, and where heavy moorings and buoys have been laid down for their accommodation, there is a depth at low water of 22 ft. A deepening of the dock is also in progress from the new entrance upwards, so as to give 20 ft. of water at neap tides, which is a considerable increase, for the depth of 17 ft., recommended by Mr. Palmer, has only been attained over a small portion of the dock within the last seven years. This deepening will be gradually extended throughout the whole length of the dock, so as to admit of the safe discharge of the largest vessels within working distance of the quays. A new dredger, the *Lady Nancy* which is capable of dredging to a depth of 26 ft., has been purchased, and, along with the Commissioners' old dredger, is engaged with double gangs of men in carrying on these works as fast as possible. The contractors for the new entrance have been Messrs. Henry Lee & Son, of Westminster, whose accepted tender was 45,000*l.*, and we are informed that the extras are comparatively small. The first pile of the dam within which the works were constructed was driven on the 6th of June, 1879, and the date fixed for completion was the 1st of June, 1881, but the contractors obtained an extension of time. The work was practically completed on the 23rd of June, when the water was let in and the gates were tested and found to be perfectly water-tight. The total quantity of soil excavated amounted to 35,000 cubic yards, and when this had been removed there was about 17,000 yards of concrete laid, and about 2,400 yards of brickwork, or, roughly speaking, about a million bricks. The quantity of stonework was also considerable,—about 1,700 cubic feet of Cornish granite, which was used for the cills, hollow quoins, and other important parts of the work, and 18,000 ft. of Bramley Fall stone. Considerable difficulties (says the *Suffolk Chronicle*, from which journal we condense these particulars), were met with in regard to these foundations. There was an immense influx of water from the gravelly stratum overlying the chalk, as well as from occasional chalk springs. For many months it was necessary to keep a centrifugal pump in constant operation, and while the work was going on in the lower trenches the water lifted and daily discharged into the dock beyond the dam was no less than 5,000,000 gallons. Besides the difficulty arising from so large a flow of water, there was a further difficulty from the nature of the chalk, which was found almost throughout at a few feet above the intended foundation level. The chalk was so much comminuted that it became very little better than whitewash, and would frequently prove insufficient to support the weight of the men working in it. The contractors adopted the expedient of covering the worst part with bags of concrete, which pressed out the water so as to allow the chalk to reconsolidate and support the concrete in mass which was laid above. At other parts clean gravel was used for a similar purpose. As soon as these difficulties were surmounted the walls were rapidly erected. They have been built of concrete in mass and faced with hard brick: the floor of the lock chamber, which is in the form of a shallow invert, was laid in concrete. The works were so designed that the whole of the excavated material should be absorbed in the making of concrete and in the backing up of the quay walls, and this balance would have been effected but for the occurrence of the soft chalk, and the commissioners have supplied extra gravel to make up the deficiency. The framework of the gates, that is the three lower ribs, the top ribs, and the heel and mitre posts, are of greenheart. The remaining portion of the gates is of Baltic fir, so much of it as is below water being covered with creosoted boarding to protect it against the sea worm *teredo*. Each gate is provided with two sluices, and there are hand-power crabs for opening and closing them. Narrow bridges are provided for the crossing of foot-passengers along their tops. Provision has been made for the putting of a third pair of gates, closing in the opposite direction, against the river, for the purpose, in conjunction with the proposed dam across the New Cut, of shutting out abnormally high tides such as occasionally flood the quays and lower parts of the town, but for the present these will not be constructed, nor will the swing bridge across the lock, for which foundations have been laid, and which, when the dam across the New Cut is constructed, will enable a railway to be carried from the Griffin wharf branch of the Great Eastern line round the south end of the dock. Mr. Bateman's designs also included the construction of a timber jetty at the southern end of the lock entrance to protect the works and give warping facilities, but there is a diversity of opinion as to the necessity of this, and it will probably stand over till experience decides the point. In order to admit of the safe approach of vessels from the river, seven heavy moorings are being laid down at the entrance to Cliff Bight, with large buoys. Such are the works which Messrs. Lee & Son have for the past two years been carrying out, their representative at Ipswich having been Mr. Bispham. The works have been throughout under the superintendence of Mr. Thomas Miller, the resident engineer of the Commissioners.

The New Post Office.—Of this new building, which includes, besides the post-office proper, a set of offices occupied by the School Board and other public bodies, we gave a view and plans little more than a year ago.* The architect is Mr. John Johnson, of Queen Victoria-street, London, whose plans were selected out of twenty-two competing designs by Mr. Chas. Barry. The building has been erected by Messrs. D. C. Jones & Co., of Gloucester, Mr. G. J. Farrow being clerk of the works. The style of the building is Italian, and the Cornhill and King-street fronts are in Portland stone, the other two sides of the building being in white brick. In the Cornhill front, which consists of ground and first floors, there is a bold portico supported by eight columns, and surmounted by four figures in a sitting posture, representing Industry, Electricity, Steam, and Commerce, each figure being accompanied by appropriate emblems, which indicate with more or less distinctness the character it is designed to sustain. The public entrance to the post-office and also the letter-box for the reception of letters are beneath this portico. The opinion prevails locally that the one defect in the design is the number and steepness of the steps which lead up to the boxes. They are six in number, and much steeper than the steps up to the Town-hall. Between the windows of the first-floor, in front, are pilasters, above which are four ornamental terminals, and, in the centre, a handsomely-carved representation of the royal arms, supported by the recumbent figures of Genius and Science, which certainly very aptly represent the services which Sir Rowland Hill and Professor Wheatstone have rendered to our postal and telegraph system. In the carved heads of the first-floor windows of this front there are heads of Vulcan, Minerva, Mercury, Ceres, and Pluto, and the arches of the ground-floor windows at the angles on each side of the portico have similar carved keystones representing Jupiter and Neptune. On the King-street side of the building the windows on the ground-floor have carved jambs, cills, and heads, and the wall-space below them, which, owing to the fall in the ground, is considerable, is relieved with highly ornamented carved panels. The keystones of the window arches are carved with characteristic heads to represent Europe, Asia, Africa, America, and Australia. The first-floor windows are plainer in character, but there is a richly-carved frieze in the entablature above. The carving was the work of Mr. Baird, of London, and the sculpture is by Mr. F. W. Woodington.

The Museum and Schools of Art.—These buildings occupy the ground which was for many years kept vacant with the idea of building a church in it for a portion of St. Margaret's parish,—the site having been generously offered to the Museum Committee by its owner, the Rev. E. Hollond, when the project for a church was finally abandoned, at the price at which he originally purchased it. A more eligible site could hardly have been obtained, unless by the purchase of valuable property in the centre of the town, and the buildings, which have been erected from the designs of Mr. Horace Cheston, A.R.I.B.A., of Great Winchester-street, London, are well suited for the purposes for which they were intended. The plan of the structure is arranged in three blocks, the central block being recessed, and a terrace placed in the recess, from which there are separate entrances to each block, the central doorway opening into the main entrance-hall, and the two side doorways at the end of the terrace into paved corridors. The style of the building is a free treatment of the English Renaissance of the Stuart period, and the front elevation is relieved with ornamental panels in terra cotta, as well as with piers and pilasters of moulded and rubbed brickwork. The panels beneath the first-floor windows display festoons of fruit and flowers, and these run round three sides of the building; there are also small panels above the pilasters, filled in with representations of various fossils illustrating the different geological periods, these having been designed by Dr. J. E. Taylor, the curator, and executed, as was all the terra-cotta work, by Messrs. Doulton, of Lambeth. Other panels in the north and south gables are filled in with conventional dragons and foliage, and with portrait heads of Newton and Hogarth. In the panels in the centre gable are symbols of Science and Art, and these words are emphasised in arabesque panels over the windows within the terrace on each side of the main doorway. The central or main building and the southern wing are devoted to the Museum and Public Library; the northern wing is occupied by the Science and Art Schools. Entering by the main entrance, the visitor finds himself in a spacious entrance-hall, 33 ft. by 18 ft., whence he may advance to the central-hall of the Museum, ascend the handsome staircase to the first floor, or proceed by the corridors to the public library in the south wing, or to the rooms of the science school in the north wing. The central museum is a handsome room lighted from the ceiling, with a floor space of 2,350 square feet, being 71 ft. 9 in. long by 33 ft. wide. There is a broad gallery round the hall, 14 ft. from the floor, which thus doubles the accommodation for wall cases. This gallery is supported by substantial iron columns, to which an appearance of lightness is given by their being painted in two shades of green, and by the use of ornamental brackets. The upper room in the south wing, to which access is gained either from the landing or by glazed doors from the gallery of the central hall, is also a fine room. It extends the whole length of the wing, 103 ft., and is 25 ft. wide, and it is, therefore, the largest room in the building. It is 22 ft. 6 in. from floor to ceiling, and is flooded with light from the south and east sides. The ground-floor of the south wing is divided between the public library and a room for use by the curator and for committee meetings. The library is a spacious room, 76 ft. by 25 ft., and 16 ft. high, with a richly-panelled ceiling, and moulded and dentilled cornices. The north wing, devoted to the Science and Art Schools, is cut up into smaller rooms. The science school is on the ground-floor; a science class-room, 40 ft. by 20 ft., and a science master's-room, 18 ft. by 12 ft. 6 in., as well as a laboratory, are provided, and this wing also includes porter's-room, general cloak-room, lavatory, store-rooms, &c. The Art School is upon the first floor, the art class-room being 72 ft. by 25 ft., divided by movable partitions, special arrangements being made for the lighting in accordance with the requirements of the Science and Art Department. The work has been carried out by Messrs. J. B. & F. Bennett, and Mr. R. T. Orr has acted as clerk of the works. An interesting paper on the history of the Museum was read during the proceedings by Dr. Taylor, the Curator.

* See *Builder*, vol. xxxviii., pp. 735, 737.

ANCIENT CHURCHES IN BEDFORD.

ROYAL ARCHÆOLOGICAL INSTITUTE.

As mentioned by us last week, the Royal Archæological Institute has been holding its annual congress in Bedford, which has now been visited by the Institute for the first time. After the luncheon which followed the address of the President of the meeting (Mr. Magniac, M.P.), a considerable number of the visitors proceeded to St. Paul's Church, under the guidance of Mr. J. Day. After spending half an hour here a perambulation was made to the site of the Castle, through the premises of Mr. Wells, who had laid bare a considerable length of the Castle wall for the inspection of the visitors. Thence a visit was made to the "Mound,"—now the Swan bowling-green,—and then to St. Mary's Church, where the rector, Rev. Canon Brereton, acted as guide, and Mr. M. Bloxam also offered a few remarks. The next spot visited was the monastery of the Grey Friars in Priory-street. Several of the visitors also gave opinions respecting different portions of these interesting remains, after the inspection of which the company made their way to St. Peter's Church. Here Mr. St. Aubyn, the architect under whom the recent additions were made to the church, by the aid of a series of drawings, greatly interested his auditors, and under his direction inspection was made of the discoveries effected during the work. The last object in the perambulation was the old George Hotel, in the High-street.

The sectional meetings commenced directly after eight o'clock, in the Bedford Rooms, when Mr. R. S. Ferguson presided over the Antiquarian Section, and a paper was read by Mr. M. H. Bloxam on "Chaucer's Monument in Westminster Abbey." The paper was full of interesting facts, and showed that Mr. Bloxam's researches had been of a most laborious character.

Afterwards the Architectural Section met under the presidency of Mr. Bloxam, and the following paper was read by Mr. J. Day on

St. Paul's Church.

The very earliest records of a church in Bedford are to be found in Domesday Book, where it is stated that "In King Edward the Confessor's time (1041-1064) Bedford was rated at half a hundred, and it still contributes at that rate towards expeditions either by land or sea. The land of this town has never been computed by hides, except one hide which in King Edward's time belonged to the Church of St. Paul's in Alms, and it still properly so belongs; but Bishop Remigius took it away from the Alms land of St. Paul's unjustly, so the Jury say." In King Edward's time (1041) Osmund's land was worth ten shillings, and Ansfrid's three shillings; at the time of the Conquest (1066), valued at the same, and also at the compilation of Domesday (1086) the same. This evidence establishes the fact that there was a Saxon church in Bedford dedicated to St. Paul. The late Mr. Wyatt was always of opinion that there was a Saxon church here which was destroyed by fire, and he thought many of the wrought stones found in the old steeple when it was taken down in 1864 belonged to the Saxon church; he had an idea also that they retained traces of fire. It is quite certain, however, that some fragments of Norman work, no doubt portions of the arch of the north transept of the Norman church, were found; for when the work of demolition had reached within 10 ft. or 12 ft. of the ground, these stones were discovered, together with the Norman respond, which had never been taken down, but simply encased by the Early English builders with their own work. This is sufficient to prove that the Norman church was not wholly destroyed in the reign of King John. These stones are now preserved in the churchyard. In excavating the ground for the new north transept, also, the workmen came upon some of the old foundations, as they termed them, which proved to be a portion of the walling of an earlier building, and appeared to be either Saxon or very early Norman work. From the character of the moulded stones now preserved, I should think the Norman church was of considerable architectural beauty, and the date of the erection very early in the twelfth century, if not previous to that. Doubtless it was of the orthodox cruciform plan, with central tower, nave, transepts, and choir terminating with an apse. History records that it was a collegiate church, and that between 1148 and 1170 the prebendaries of St. Paul's were changed into black or regular canons and removed to Newenham, in the parish of Goldington, by Simon de Beauchamp, in accordance with the wishes of his mother Roisia, wife of Paganus de Beauchamp. Simon de Beauchamp was buried here in 1208, and the slab which covered his grave is still to be seen in the chancel of the present church. Leland says of it:—"Simon de Beauchamp lyeth afore the High Altar of St. Paul's Church in Bedeford, with this Epitaphie in bras, and set on a flat marble stone—'Under this stone lyeth Simon de Beauchamp, Founder of Newenham." This, which was the earliest known English brass, disappeared long ago. In 1878-79 the north and south walls of the church were opened up with the present arches, and a clearstory added, and in taking down the south wall, two portions of figures were discovered built in the old wall. It is conjectured one is a portion of the effigy of one of the Beauchamps, probably William de Beauchamp, to whom King Henry granted the site of the castle after its demolition. The figure was no doubt recumbent in a recess in this wall. In the history of Bedford Castle we read that in the reign of King John, A.D. 1216, the Collegate Church of St. Paul was pulled down to rebuild and fortify the castle. It is quite certain, however, that the church was not entirely demolished, but that sufficient material for the fortification having been obtained, some considerable portions of the walls were left standing, more especially the walls of the tower and other solid portions, and so most of the monuments and tombs would remain untouched through their being covered with small stones and rubbish. The church was in ruins for from eight to ten years, for we learn from the history of the castle that King Henry III., after he had reduced the castle and ordered it to be destroyed granted a portion of the old stones to the monks of Newenham for the reparation or rebuilding of St. Paul's Church. This brings us now to the history of the present building, which is the church referred to as being rebuilt in the thirteenth century after the demolition of the castle. I have no doubt it was rebuilt upon the Norman foundations; in fact, the old tower walls were not pulled down to the ground, nor scarcely any of the walls of the other parts of the church, and when rebuilt the old Norman arches of the tower were taken out by the Early English builders, the jambs cut away so as to widen the openings, the arches were then sprung from the jambs, the opening into the north transept on the north side of the tower was contracted on one side and the respond of the Norman arch built in, and it remained until this old Early English steeple was pulled down a few years ago. As I said just now, the Early English church was built on the foundations of the Norman church; at the same time also the additional nave, together with the south chancel, or what is now called the archdeacon's court, was also added to the plan. This necessitated the re-erection of the south transept to connect the south chancel with the new south nave. The old Norman north transept was not rebuilt; nearly all the walls of the present church are therefore Early English. I have reason to believe that the Norman and Early English chancels were somewhat longer than the present chancel, for one can plainly see that a portion of the piscina has really been built in with the present east end, and just above can be seen one of the corbel stones which no doubt received the jack-leg or wall piece of a former roof; this shows that the chancel must have extended beyond the line of the present east end; the windows north and south of the altar also are unusually near to the east end. Possibly the lady-chapel may have been eastward also of the high altar. I am not at all inclined to think that the Early English church was equal in any respect to the Norman church, neither do I think it was used wholly at that time nor at any subsequent period until this last restoration. The addition by the Early English builders of the south nave and chancel made a kind of a double church of it, but for what purpose this was done can only be a matter of conjecture. I should say in all probability it was built for and used as the chapel of the Trinity Brethren, one of the religious orders in Bedford at that time. From the immense length of the nave and chancel, with a central tower intervening resting upon immensely solid masonry with very low arches, I cannot imagine how the whole of the church could be used: a separate service must have been held in the chancel. From what I have seen lately, during the alterations in the chancel, I should say the south wall of the chancel was nearly all Norman work, for in carrying up the walls of the clearstory I found a considerable difference both in the thickness of the wall and quality of the masonry. I am quite certain, therefore, that in this case the Norman wall was not pulled down entirely; subsequently (probably in the latter part of the fourteenth or early in the fifteenth century) this wall was pierced with two openings, the responds and arches of which were something similar to those of the nave, the caps and bases being of a much later date. I think it was to make room for these openings that the effigy of the Beauchamps was removed and built in the wall as near to the place it was taken from as possible, as it was found in the respond of the westernmost arch. No very material alterations were made to the church in the fourteenth century beyond the insertion, in the north and south walls of the nave, of four-light windows similar to that which now remains in the north wall, together with the insertion of the south and west doorways, the rebuilding of the west end entirely, together with the strengthening of the buttresses, which, previously to the insertion of the four-light windows, were very slight. The upper stages of these Early English buttresses are now visible, those of the latter period being simply added on to the earlier ones. The north and south windows in the chancel were also inserted at the time, the chancel remaining the same length as in the Early English time. It was not until late in the fifteenth century that any further extensive alterations were made in this building, but at that time the character of the church was materially altered; the clearstory was added to the two naves, which necessitated heightening the piers and lifting the arches. The north and south porches, with the parvise over the south porch, were also added, the chancel contracted to the line of the present east end, and the vestry with the sacristan's room over was also built. The windows in the nave were filled up, and the three-light Perpendicular ones inserted, together with the two west windows. Upon a minute examination of the south porch, much interesting work may be seen. I refer to the handsome groined and canopied niches, containing figures of St. Peter and St. Paul; the detail of the embattled parapet is also very good. The doorway is the depressed four-centred arch of the fifteenth century within a square head with a hood-mould over; the west spandrel is filled in with a portcullis and the east with a shield, and what is apparently a ragged staff, which has the peculiarity of being minus the usual Bear of the Earls of Warwick. It is quite possible that Thomas de Beauchamp had something to do with the building at that time. The chancel walls and the walls of the south aisles were also raised in the fifteenth century; the chancel has the original fifteenth-century roof, which was repaired in 1848. At the same time, also, the nave roofs were entirely renewed, the figures and enrichments being all that remain of the original roofs of the two naves. At the time the clearstory was added to the chancel the roof was not taken off, but raised bodily with screw jacks, and underpinned until the proper height was attained and then re-leaded and made good; the present roofs of the nave are an exact copy of the original. It is worthy of notice that although the two roofs are apparently similar to each other, yet upon minute examination they will be found to differ materially, for one has tie-beams and principals alternately and the other has all tie-beams. There were some interesting old fifteenth century parcloses in the openings between the two chancels, but I am afraid these were destroyed in 1848 to make room for more modern screens. I am happy to say, however, that the old rood-screen is still in existence, although sadly mutilated, but there is enough of it left to enable one to thoroughly restore it. Mr. George Wells has kindly undertaken to store it for the churchwardens until funds can be obtained for its restoration. The stone pulpit standing at the north-east angle of the Archdeacon's Court is the ancient fifteenth-century one, and was, I believe, originally fixed against the easternmost pier of the nave arcade; Lysons speaks of it as "being ornamented with gilt tracery upon a blue ground." This is the pulpit in which John Wesley preached his celebrated sermon, "The Great Assize." The church, one can plainly see, did not escape the mutilation which took place in the Commonwealth, but suffered as much, or I may say more, than many others. In 1864,

however, the new incumbent, the Rev. W. G. Fitzgerald, found it necessary to do something towards improving the services, and an attempt was made to restore the church, a committee was formed, and subscriptions were obtained for thoroughly restoring and enlarging the church. Whilst the committee were deliberating upon the propriety of either pulling down the old church and building a new one entirely, or restoring the old one by rebuilding the steeple and otherwise enlarging the fabric, their proceedings were watched very narrowly by the general public, who felt that such an ancient landmark as St. Paul's steeple ought not to be pulled down and lost sight of for ever if it was possible to conserve it. A memorial, therefore, was drawn up, praying the committee to seek further advice before committing themselves to any scheme. This memorial was most numerously signed by the inhabitants of both town and county, and acting upon the suggestions contained therein, the committee at a subsequent meeting passed a resolution that Mr. G. E. Street should be requested to report and advise upon the matter. In his report, dated June, 1865, he states:—"The questions which arise in connexion with the restoration and enlargement of St. Paul's, Bedford, are in many respects so delicate and embarrassing that I confess to having considerable difficulty and some reluctance in reporting upon it." After advising a strictly conservative feeling in whatever was undertaken, he proceeds to say "that he never saw so long a church which was in its old state so practically useless for a large congregation; the particular division of the nave proper, being divided in the centre, produces the effect of two small churches," and he goes on to say that the only possible remedy would be some such modification of the structure as would allow of full use of the whole of the area enclosed within the external walls; this he recommends should be accomplished by the removal of the old steeple from its central position and placing it northwards; this course, although, as he states, is "attended by very weighty objections on architectural and antiquarian grounds," and the condition of the lower part of the steeple he reports as being so bad that it must ere long be either very extensively repaired or removed; he recommends, therefore, that the opportunity should then be taken to rebuild it in a more convenient position, but only on one condition, viz., "that all the wrought stones be marked, and the whole rebuilt stone for stone with no alteration of design"; the report was accompanied by a rough plan. Mr. Street felt very strongly that his advice should be taken, and if they did not concur with him he thought it would be most unfortunate if the building was touched at all; he stated that it would be best to suffer the inconvenience which our forefathers had endured for centuries, using only a portion of the old church, which he goes on to say was full of interest and architectural value, and advocated careful restoration and deprecated any departure from the old work. I have quoted largely from Mr. Street's report to show that the committee had the best advice that could be obtained, which, however, for some reason or other they did not follow, for they decided to rebuild the steeple on the old site. The result you have seen, and can best judge how far you think they have been successful.

Mr. G. Hurst at the same meeting read a paper on

St. Mary's Church.

The church of St. Mary, on the south side of the river Ouse at Bedford, is interesting on account of its high antiquity, and although portions of it have been modernised at various times, still there is sufficient remaining to show that it dates back to the Anglo-Saxon period. It formerly consisted of a nave, central tower, transepts, and a chancel. The aisles are of more recent construction; the tower is of good Norman character. It has on each side of the second stage a window of two narrow arched openings divided by a shaft, the whole enclosed within a large arch of semicircular form. On each face of the upper stage are the outlines of two small Norman lights of well-wrought ashlar, now closed, but between them Perpendicular windows of two lights have been inserted. The original plain Norman parapet has been replaced by the more modern embattlement. The north transept has long since disappeared, but the south one well merits attention, being clearly of Anglo-Saxon construction, with the exception of an arched outline similar to those in the upper stage of the tower, which was doubtless inserted when the tower was erected. With this exception, the masonry is of a much ruder character, is composed of mixed materials, and contains a considerable quantity of the green sandstone. A portion of it is of herring-bone workmanship. The presence of sandstone would indicate that it was erected with the materials of a still older building, probably Roman, as these stones must have been brought from the neighbourhood of Sandy, where the Romans had an important station, and which would not have been done had they been aware of the limestone quarries of the neighbourhood. The west end wall of the nave is original. Until the middle of the sixteenth century, opposite the west end of St. Mary's, and nearly abutting upon it, stood another church, called St. Peter's Dunstable, probably connected in some way formerly with Dunstable Priory. The site of this building was the now open space called St. Mary's-square, but it extended one-third into the present roadway, as, in laying down some gas-pipes a few years since, the eastern foundations were discovered, so the road between the two churches could scarcely be of sufficient width for more than a single cart. The services were conducted in each church on alternate weeks, and the books and ornaments removed from the one to the other. St. Peter's Church was of Early English architecture, and, accordingly, of more recent construction than the other edifice. The churchyard must have extended a considerable way westward, and have occupied a large space, now built over, as is indicated by the occasional exhumation of human bones whenever a cellar or foundation is required. After the destruction of the church, the north aisle of St. Mary's was built with part of the materials in the year 1546. The spandrels of the doorway contains, as an ornament, the carved cross-keys which distinguished the demolished church. There must have been a good deal of pinching upon the old churchyard, as is proved by the quantity of human bones discovered when any alterations have been made in the adjacent buildings. Boswell, in his picturesque views of the antiquities of England and Wales, states that the parapet of the bridge was erected in the reign of Queen Mary out of the ruins of St. Dunstan's Church which stood on the south side of the bridge. This is a corroboration of what many suppose, that the church was originally dedicated to St. Dunstan, and was subsequently re-dedicated to St. Peter on being annexed to Dunstable Priory. When the north aisle of St. Mary's was constructed, to throw it open to the church the nave wall was pierced with three arches, but being small, the parishioners had their sight obstructed, and to remedy this defect the whole of the north wall of the nave was, in the year 1840, pulled down, and the present colonnade was substituted. In the year 1853 the south aisle was added. In consequence of a rent in the south-west angle of the tower, the architect declined to pull down the whole of the nave wall, but left sufficient to serve as a buttress for its support. The western wall of the south transept from the aisle was pierced, and an arch made to correspond with that on the north aisle, thereby making a communication with the transept. A great part of the south wall of the nave had in former years been removed to insert three large Early English windows; but when the entire wall was removed to subjoin the aisle in 1853, it was found chiefly composed of herring-bone work of the native stone, and very ancient. Up to the commencement of the present century the nave had a wooden roof covered with lead. Repairs being required, the work, under church-warden management of the period, and there being no resident incumbent, was protracted for a very long time; and the roof left partly open. The lead was appropriated by some of the managers, and the present drawing-room ceiling was constructed. According to what has been related of this transaction it was hardly creditable to some of the leading parishioners. On the south side of the altar are deposited two stone coffins of the thirteenth century, the lids even with the floor; they were found buried in some other part of the church when alterations were in progress, and were removed to this position. On the north side is another coffin of about the same date, discovered under the floor of St. Leonard's Hospital when that venerable building was taken down to make way for an extension of the North-Western railway station. This establishment was founded previously to the year 1302 by the townsmen of Bedford for "six Freres Chapleynis, wearing a religious habit," and according to Dugdale was a hospital for Lazars. The coffin was sold by auction with the old materials of the hospital, and remained for some years afterwards, with its contents, disregarded in a carpenter's yard, whose effects being afterwards sold, this, by the good taste of the auctioneer, was preserved from a second desecration, and purchased by him privately and presented to the Bedfordshire Archæological Society, who obtained permission to place it in its present position. The coffin was cut from one stone, and tapers from head to foot, with a rounded excavation for the head. A floriated cross with a circular head, but considerably mutilated, ornaments the centre of the lid. The remains contained in the coffin, when first discovered, were found to be an entire skeleton, and probably of one of the early masters of the Hospital, as with them was a pewter paten . .

The President, on behalf of the members, thanked Mr. Day and Mr. Hurst for their papers.

Dr. Goldsmith asked what special period in architecture herring-bone masonry marked.

The President.—From the Roman period up to the fourteenth century.

On Wednesday, the 27th, there was an excursion, viâ Bletchley, to Leighton Buzzard, Stukeley, Wing, Eddlesborough, and Dunstable. On Thursday there was an excursion to Cople, Sandy, and Risinghoe Castle.

Among other papers read during the week were "Recent Memorials of Bunyan," by the Rev. J. Brown, B.A.; "The Grey Friars' Priory, Bedford," by the Rev. Canon Warmoll; "The Connexion of John Bunyan with Elstow," by the Rev. J. Copner; "The Brasses of Bedfordshire," by the Rev. H. Addington; "The Earthworks of Yeldon," by the Rev. R. S. Baker; and "The Treatment of Ancient Architectural Remains," by Mr. J. T. Micklethwaite, F.S.A.

BUILDERS' MACHINERY AT THE ROYAL AGRICULTURAL SOCIETY'S SHOW, DERBY.

A NUMBER of the agricultural engineering firms exhibited saw-benches, &c. Several of these were well made, but they were almost entirely of light and crude design, and certainly cannot be compared with the productions of the engineers who make this class of machinery a speciality.

Messrs. A. H. Bateman & Co. (Limited), East Greenwich, exhibited a band-saw sharpening-machine, made by Bichon & Co., Paris. It is of ingenious construction, and should, if well handled, be of service where a number of machines are employed.

A portable balanced crane, which should be of considerable use in a timber merchant's or contractor's yard, was shown by Messrs. S. E. Ransome & Co., of London. The crane is self-contained, and is so arranged that the angle of the jib can be readily extended or diminished, as required. If the load on the jib should tend to over-balance the crane, by means of a handle and screw the radius of the jib can be lessened, till the back end of the travelling-carriage is of sufficient weight to counter-balance it. Being mounted on a pair of high wheels, it can, with a load of 10 cwt., be easily moved from place to place by one man. By extending the front of the jib-carriage framing, and carving it downwards, the crane is prevented from toppling over, even should the load be too heavy.

Messrs. Allchin & Son, of Northampton, exhibited a rack saw-bench and a band-sawing machine; these were marked at low prices, but were of crude construction. The rack saw-bench was made chiefly of wood, the centre frame of oak, and the ends of red deal. The saw-spindle was of iron, and arranged to run in conical bearings. From our experience we do not recommend this form of bearings for saw spindles, as little or nothing is gained from their use, and they are much more difficult to keep in order. The travelling-table was of pitch-pine, and fitted with a hand-power rack-feed. The main frame of the band-sawing machine was of wood, with a cast-iron column bolted to it. Altogether these machines would do credit to a settler who may have rigged them up in the backwoods of America, but they are hardly what we should look for as the products of an English engineer, and are in striking contrast to the traction engine exhibited by the same firm, which shows good design and workmanship.

Messrs. Priestman Bros., of Hull, exhibited

one of their patent steam excavators and dredgers. This was filled and discharged by one man, and being arranged with rotary and traversing motion, should be of immense service in large dock or other contracts, or in lifting sand, shingle, or grain. At this stand, too, was exhibited a capital form of patent disengaging gear for hoisting or lowering goods or discharging cargoes of almost any material; this disengaging hook is so arranged that as long as the weight bears on it the load is held, but immediately it touches the ground or vessel, the hook becomes disengaged and is immediately withdrawn by a duplicate chain. A Keatle's Patent Boiler arranged with an inserted fire-box, which formed a water space, was also shown at this stand.

Messrs. Richard Garrett & Sons, of Leiston, exhibited a portable saw-bench, specially designed for forest use, but, except that it was mounted on extra large wheels to facilitate transport, it does not possess any special feature of interest. Several compound portable engines of excellent design and workmanship were also shown at this stand.

Messrs. Aveling & Porter, of Rochester, exhibited an improved form of tipping-wagon, which appeared to be well adapted for contractors' use: it was arranged to tip sideways, and the body of the wagon was readily canted by means of a hand-wheel and spindle, which worked a pair of chains. The body of the wagon was lined with sheet iron, it being found in practice that the load will more readily leave the smooth iron surface than it will one of wood.

A considerable number of more or less well-known brickmaking-machines were exhibited by Messrs. Bradley & Craven, Abell, Pinfold, Whittaker, Fawcett, and Bennett & Sayer. The machine shown by Messrs. Bennett & Sayer, of Derby, was designed for the plastic process, and embodied in its construction several improvements, including marine type multiple collar, thrust bearing at pug end, improved internal bearing, and end knife. The steam brick-press, shown by the same makers, was fitted with a top spring box and adjustable brick die-box, for taking up wear. The cutting-off table was Murray's patent.

Several engines were exhibited especially well adapted for driving sawing and wood-working machinery, where the load is often very severe, and varies constantly. In this case, to secure economy in working, especially sensitive governor gear should be employed, so that when a heavy machine, — a circular saw-bench for instance,—is thrown out of gear, the steam may be immediately controlled and prevented from entering the cylinder, and being used to waste. Messrs. E. R. & F. Turner, of Ipswich, showed engines fitted with Hartnell's Patent Automatic Expansion Governor. This form of expansion gear presents several features of interest. The principle utilised in its construction is that of centrifugal force, which, acting on a pair of weights suspended on pins, tends to throw them outwards. They are, however, governed and restrained in their action by spiral springs. The weights in flying out carry with them a quadrant or curved lever, which is arranged in such a way that it automatically acts on the slide-valve eccentric, and diminishes its stroke, thus lessening the stroke of the slide-valve, and reducing in proportion the supply of steam. Another advantage in this expansion gear is that instead of cutting off the steam by the ordinary throttle-valve, and thus diminishing its pressure before it enters the cylinder, it allows the steam to enter the cylinder at its full boiler pressure, but varies the cut-off of the stroke as the load on the engine may require, the full benefit from the expansive force of the steam being thus utilised.

Messrs. Shanks & Son, of Arbroath, exhibited a newly-designed horizontal high-pressure engine, of the girder type. It was arranged with a stroke of double the diameter of the cylinder. We may here say we are in favour of a long stroke and early cut-off for driving wood-working machinery, as ample time is given for the steam to expand, and more value is thus obtained from it. An equilibrium governor, with stop and throttle valve combined, was also fitted, and an outside bearing provided for the crank shaft. The girder framing of the engine, although strong, was, to our mind, somewhat inelegant in design.

Messrs. Ruston, Proctor, & Co., of Lincoln, exhibited a well-designed and strongly-proportioned horizontal engine, well adapted for the heavy duty of a saw-mill.

A number of stone-breaking machines were shown in operation, but most of them are too well known to need description.

A goodly array of centrifugal, rotary, direct-acting, and other pumps more or less adapted for contractors' purposes were exhibited.

Several centrifugal pumps were shown working by Messrs. Williamson, Bros., of Kendal, in conjunction with their vortex turbine water-wheel; they were of simple construction, and throw a considerable volume of water. When used for low lifts,—say not above 20 ft.—for drainage, irrigation, and such like purposes, this form of pump has much to commend it, bearing in mind its low first cost, and little liability to disarrangement.

Messrs. Evans & Co., of Wolverhampton, had a large exhibit of pumps, including a sample of their hydraulic rams, a form of pump somewhat neglected, but admirably adapted for supplying water to mansions, &c. The principle on which the ram works is that a larger volume of water having a certain fall will force, under certain conditions, a smaller volume of water to a higher point than it is itself. Very high or very low falls of water can be utilised, but both of these extremes should, if possible, be avoided, as in the case of a very high fall the friction caused by the force of the water, and consequent wear and tear on the working parts of the ram, is very great. In the case of a very low fall, the quantity of water raised is, of course, correspondingly small. The ram under notice is simply and strongly designed. The "beat," "delivery," and "snifting" valves are of gun metal, and the joints are faced.

Messrs. J. Rollins & Co., Limited, of London, exhibited several of the Douglas American hydraulic rams.

The general arrangement of the Show was excellent.

THE MARIENKAPELLE, WURZBURG.

The church called the Marienkapelle, or St. Mary's Chapel, at Wurzburg, probably because it stands upon the site of a smaller structure bearing that dedication, is a fine example of a German hall church, and offers several points worthy of study, if not of imitation.

Kugler gives 1377 as the date of the commencement of this building, which makes it the exact contemporary of the Karlshofer Church at Prague and the choir of St. Sebald, Nuremberg. Like most ancient churches, however, it appears to have been many years in course of construction. The sculpture of the doorways and the statues of the apostles round the columns were not executed until quite the end of the fifteenth century. Although both Kugler and the excellent Hand-book for the Maine, by Hänle & Spruner (Wurzburg, 1843), give the date 1377 as that of the commencement of the building, neither gives the date of its completion. As, however, it is shown in the ancient views of Wurzburg, that, for instance, in the Nuremberg Chronicle, 1482, it was certainly finished before the close of the fifteenth century, except perhaps the sculpture, which is known to have been executed by the celebrated Wurzburg sculptor, Tilman Riemenschneider.

The plan of the church is remarkably simple. It consists alone of a nave and aisles of the same height, under a single external roof. The nave is prolonged beyond the aisles, and forms a chancel. A tower and spire are attached to the north-west angle, and there is an original sacristy north of the choir. Internally the building is a vaulted hall, divided into a nave and aisles by tall and very slender octagonal piers, without capitals. Attached to the cardinal faces of the octagonal piers are corbels carrying very finely executed statues. The organ-loft is original, and is vaulted beneath. There is no ancient furniture. What at present exists is modern Gothic.

What particularly strikes one about this church is its simplicity of plan and arrangement, and the absence of anything that could cut up the design. The consequence is that although it is surrounded by houses four stories high, it looks large and impressive; in fact, it looks larger than it really is, for the whole church is only about 140 ft. long.

These "hall churches" seem to offer an excellent suggestion for ecclesiastical buildings in London and the great manufacturing towns. The pretty little Northamptonshire churches, which are over and over again reproduced in our large towns, look absurd when surrounded by immense factories or Belgravian mansions, and if Gothic architecture is to retain its hold upon the age, some much bolder and larger treatment must be found than that usually displayed in our urban churches; and it seems to us that the hall churches of Germany and the great brick single-span churches of the South of France offer suggestions as to the kind of treatment architects might do well to study.

The little shops round the Marienkapelle at Wurzburg are not, as people often suppose, a modern introduction; on the contrary, they are represented in a painting of the church executed at the very beginning of the sixteenth century. A great deal has been written about houses and shops built up against churches, and, of course, there are practical objections to the system,—danger from fire, for example,—yet there can be no doubt that many Mediæval churches were erected with the absolute understanding that they would be built up against.

The upper portion of the spire of the Marienkapelle at Wurzburg is quite modern, and not very satisfactory, though it is more or less a copy of an ancient original, *i.e.*, St. Mary's at Esslingen.

NEW OFFICES FOR THE LONDON AND LANCASHIRE LIFE ASSURANCE COMPANY.

The building, of which we gave a short notice on the 11th of June last,* and which we this week illustrate, is now finished. The style of the architecture is French Renaissance of an early type. The internal finishings have been carefully designed in character with the architecture, the ground-floor screens, desks, and counters being in two kinds of mahogany, with rosewood mouldings; the staircase leading from the ground-floor to the board-room on the first floor is also in mahogany. The entrance-doors are of teak, the central panels being carved with medallions symbolical of Life and Fire. The ceiling is in fibrous plaster, with rib mouldings interlacing, and fan-ribbed vaults springing from the central columns. This portion of the work was executed by Messrs. G. Jackson & Sons, of Rathbone-place. The public space is paved with mosaic. The screens on the first floor are in black walnut, those on the second floor being in grey walnut, and the upper floors pitch pine.

The offices on the upper floors are approached from Sun-court by an easy staircase of Craigleith stone. The lavatories and water-closets are lined with tiles in colours, the floors also being of the same material.

The peculiarity of the site as intersected by the gateway necessitated, to some extent, a departure from the usual practice in designing the upper portion of the front by making single columns only possible at the ends.

Mr. T. Chatfeild Clarke, of Bishopsgate-street Within, is the architect; and Messrs. Colls & Sons are the builders.

The desks and screens on the ground-floor have been executed by Mr. W. H. Lascelles; the marble mosaic is by Messrs. Burke & Co.; and the carving by Mr. F. G. Anstey, who also made the specially-designed chimney-pieces with which the fireplaces are fitted throughout.

Art at the Crystal Palace.—The several scholarships and art prizes pertaining to the Ladies' Division of the Crystal Palace School of Art, Science, and Literature, have been awarded:—The Committee of Artists, Mr. H. Stacy Marks, R.A.; Mr. Alfred D. Fripp, of the R.S.P.W.C.; and Mr. W. F. Woodington, A.R.A., adjudged the silver medal for Mr. E. Goodall's pupils to Miss Mary E. Grose, of Forest-hill, for two picturesque studies in the Italian and Renaissance vestibules; and the certificate to Miss Catherine Maltilda Banks, of London, for a picture of the "Pompeian Court." Miss Beatrice A. Brown, of Honor Oak Park, who had the scholarship last year, took the certificate among Mr. F. Smallfield's students for painting from the life; and the same student obtained the certificate among Mr. O. Von Glehn's pupils for drawing from the life. The medal for drawing from the antique and from the life was gained by Miss Edith Mary Chambers, of Sydenham. For sculpture, Mrs. Cottingham, of Norwood, got the certificate; and to this lady, among the winners of the certificates, the scholarship in art for 1881-82 was adjudged.

* See vol. xl., p. 744.



Whiteman & Bass, *Photo Lith.* [illegible]

Wyman & Sons, Printers, Gt Queen St.

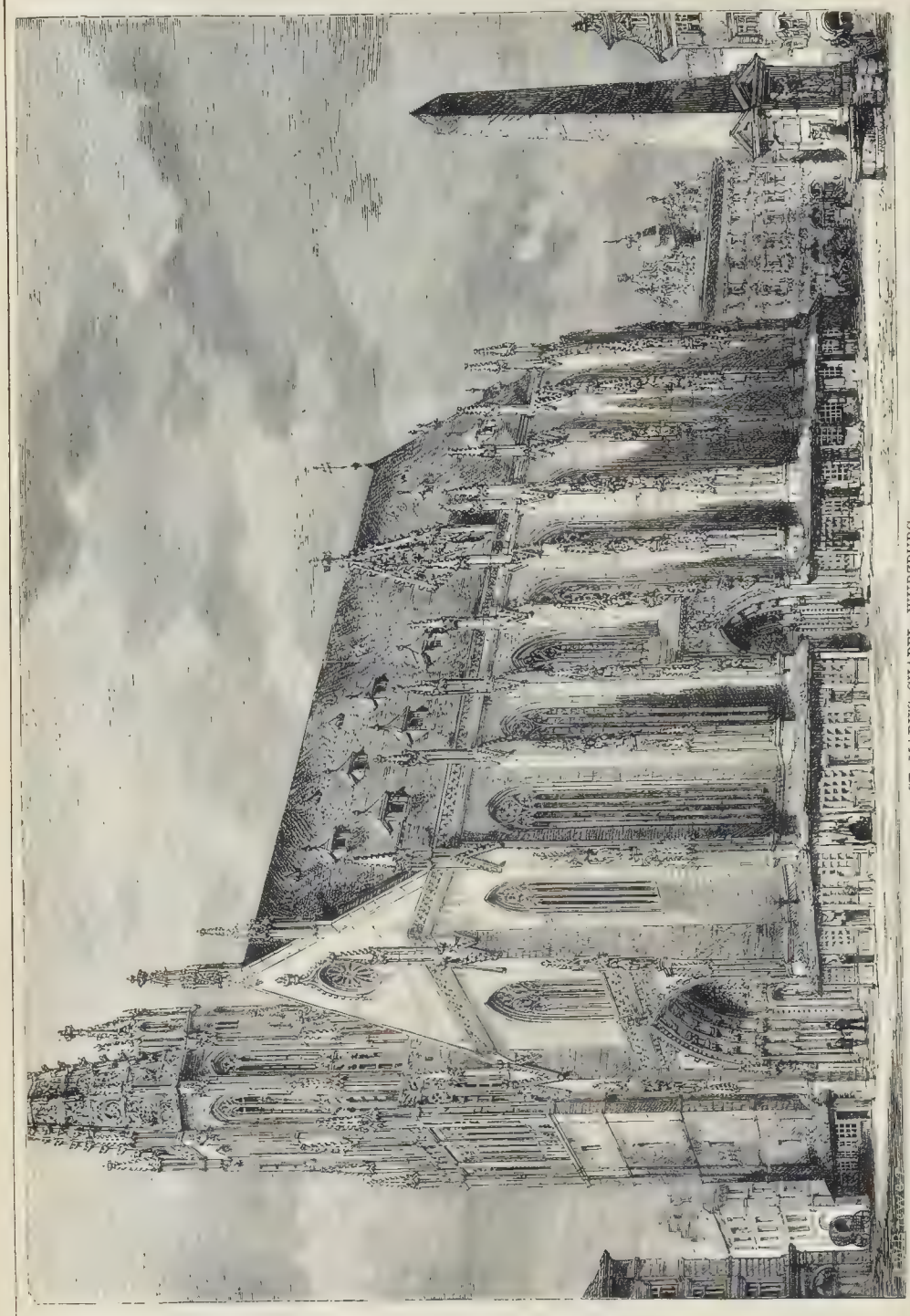
ST. KATHARINE'S TRAINING COLLEGE, TOTTENHAM.—MR. ARTHUR W. BLOMFIELD, M.A., ARCHITECT.





Wyman & Sons Printers

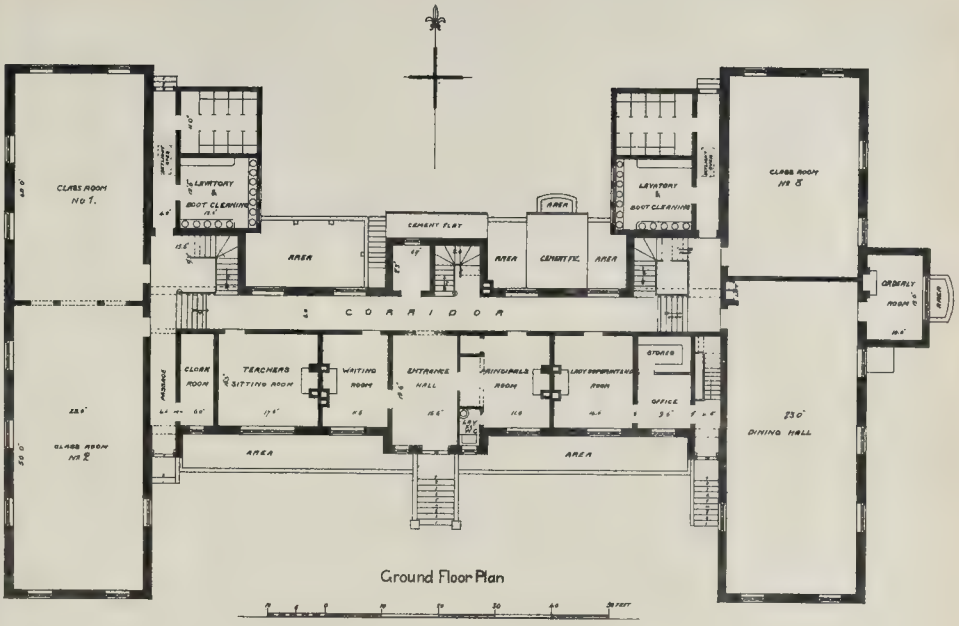
THE LONDON AND LANCASHIRE LIFE ASSURANCE COMPANY'S NEW OFFICES, CORNHILL.—Mr. T. Chatfeild Clarke, Architect.



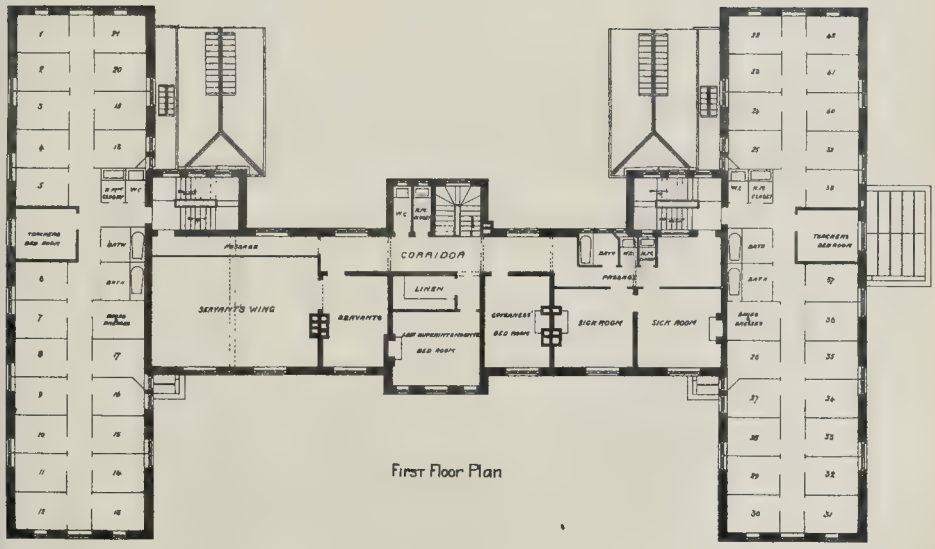
ST. MARY'S CHAPEL, WURZBURG.



STATUETTE OF MINERVA, RECENTLY FOUND IN ATHENS.



Ground Floor Plan



First Floor Plan

Whiteman & Bass *Photo-Litho*

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ST. KATHARINE'S TRAINING COLLEGE, TOTTENHAM.

STATUETTE OF MINERVA RECENTLY FOUND IN ATHENS.

We give a view of this statuette, found a few months ago in Athens. We have already published a description of it, and commented on the misconceptions about it which at first prevailed, but may here recapitulate the chief points.

The statuette is of Pentelican marble, and, inclusive of the socle (which is 6 centimètres high), it stands 96 centimètres, or 37·79 in. high. All the archæologists of Athens agree in the opinion that, as to form, it is a diminutive copy (made probably in the first century of the Christian era) of the chryselephantine, or gold and ivory, statue of Athene, produced by Phidias for the Parthenon. On the front of the helmet there is a sphinx in repose, flanked on either side by a griffin; on the right and left of each of the griffins is an eagle's wing. The sphinx has a crest, and the griffins have smaller crests. (These details are not all shown in our view.) When the statuette was discovered, the head of the sphinx was found to have been broken off, as also had the griffins and the eagles' wings, but, with the exceptions of the griffins' heads, all the fragments were recovered. The profile is good, though the parts about the mouth are somewhat coarsely executed. On the helmet of the statuette some red lines are reported to be visible, and it is further stated that the hair, passing down from under the helmet, over the brow and on to the breast, shows traces of yellow colour, and that the eyebrows are reddish-brown and the pupils of the eyes blue,—the right eye still preserving the colour very clearly. The *chiton*, or under-robe, reaches down to the feet, while the *himation*, or outer cloak, is gathered up by a girdle that ends in two snakes' heads. Worn over the shoulders, and extending half-way down the back and bosom, is some scale armour. The back part of this shows no ornamentation, but in the centre of the front portion is a head of Medusa, showing traces of red colour. The left arm of the statuette, which appears to be somewhat disproportionately long, holds a shield which rests upon the ground. In the middle of the external face of the shield is a Medusa's head, with traces of red colour. Between the shield and the figure is a serpent, which rears its head nearly as high as the top of the shield. The serpent's head is yellow, other portions of the reptile being coloured red. The right arm of the figure, which was broken off at the elbow when found, rests on a nondescript kind of column, which was likewise broken when discovered. In the right hand is held a small winged figure of Nike (Victory) looking away from the statue. The figure of Nike has the drapery thrown over the left arm. This figure was broken into a number of pieces, all of which, however, have been recovered, except the head, for which the municipality of Athens have offered a reward of 500 francs.

Professor C. T. Newton, of the British Museum, in one of his lectures on "Greek Art in the Age of Pericles,"—the whole of which were reported by us in the early months of the present year,—referred at some length to this statuette as throwing light on Phidias's chryselephantine statue of Athene in the Parthenon, of which, he thought there could be no doubt, it was a rough copy,—a dull, cold, lifeless, Roman copy,—made for votive purposes. That the statuette was meant to be a representation of the famous work of Phidias, Mr. Newton observed, there was evidence in the writings of Pausanias, who mentioned that the left hand (*i.e.*, the same hand that supported the shield) of the chryselephantine statue held a spear. The probability was, he thought, that in the chryselephantine statue the goddess was represented as holding the spear between the thumb and forefinger of the left hand, while the remaining three fingers of the hand grasped the top edge of the shield. The disposition of the fingers of the left hand of the statuette is, as will be seen, different to that suggested by Mr. Newton as having existed in Phidias's great work. With regard to the column,—architecturally of a very debased type,—which has been introduced into the statuette as a support for the right arm of the goddess,—the arm which holds up the Victory,—Mr. Newton observed that there was no evidence given by ancient writers of the existence of any such column in connexion with the great chryselephantine statue, and, although in one or two ancient reliefs representing the statue a column was introduced to support the arm, there was, he thought, no valid ground for assuming that Phidias's great work included such a column. In his opinion, the column in the statuette was introduced with the simple view of strengthening the arm of the figure, which, being of marble, would be extremely liable to be broken off without some such support. The statuette, said Mr. Newton, was doubtless only intended to recall to the worshippers of the goddess the main features of her famous chryselephantine statue. How the arm of the latter was made, unaided by a column or some such support, to sustain the weight of the statue of Victory which she held in her hand, he was unable to say. The weight of the Victory held by the chryselephantine statue must have been considerable, and from the way in which the arm was held out, the leverage exerted must have been very great. Probably a bar of copper extended throughout the whole length of the arm of the statue.

ST. KATHARINE'S TRAINING COLLEGE FOR SCHOOL MISTRESSES, TOTTENHAM.

This institution has been established by the Society for the Promotion of Christian Knowledge, and is intended for the training of schoolmistresses for Church schools. Accommodation is provided for 100 students, a lady superintendent, governesses, and the necessary servants of the establishments.

Lecture-rooms and class-rooms are provided, and a sitting-room for the principal, who will ultimately have a residence close to the college.

Large schools for girls and infants, and a higher-grade school for girls, have been erected on the east side, connected with the main building by a covered way.

The whole of the buildings are of stock-brick, relieved with bands and string-courses of red. Lascelles's patent concrete is used in the chimney-shafts and in other positions instead of stone. The roofs are covered with Broseley tiles.

The contractors were Messrs. Dove Bros., and Mr. W. Overton was clerk of the works. Mr. A. Blomfield, M.A., was the architect.

At the last distribution of prizes, the Rev. E. Hobson (principal) dwelt on the fact that the buildings were found to admirably answer the purposes for which they were designed, and that in every department of the institution, and in almost every detail of every department, they found the requirements of the residents completely satisfied.

SANITARY PLUMBING.

SOIL-PIPE AND WASTE-PIPE CONNEXIONS, DRAIN VENTILATION, AND FLUSHING.

Mr. S. Stevens Hellyer delivered his sixth and concluding lecture* on "The Science and Art of Sanitary Plumbing," on Thursday, the 28th ult., in the Hall of the Society of Arts, Professor Henry Robinson, of King's College, in the chair. The subjects treated of were the connexions of branch pipes with main pipes and traps; waste or overflow pipes from safes; cistern wastes; disconnexion of drains from sewers and cesspools; drain ventilation; and the value of good water flushing. The lecturer commenced by observing that what he had to say might appear too full of detail, but if ever we were to arrive at perfection in sanitary plumbing, we must pay great attention to all its details. A general and roughly-carried out sanitary arrangement might do very well for temporary encampments, but places which were to be used as our homes, and the homes of our children, must have every hole and corner lighted and ventilated; every water-closet, sink, bath, and lavatory, constructed on sanitary principles; every trap self-cleansing; every waste-pipe, soil-pipe, and drain wholesome; in short, if there was to be no harbouring of filth in any part of the drainage system, it must be perfect in all its details.

Connexions of Branches with Main Pipes.—All branches, whether for conveying dirty water, soil, or sewage, should be connected to their main pipes in such a way that the discharges through them shall pass into the main pipe in the direction of its outfall, and in such a manner as not to foul any part of the pipe, be it a waste-pipe, soil-pipe, or drain, where it would not be cleansed by the flush of water following such discharges. In fixing a range of water-closets on a floor, the branches from them were often made to enter the chief branch on its upper side, and in such a manner that the discharges through any of the minor branches nearest the main stack would foul the chief branch, where it could not get cleansed again until a water-closet more remote from the main stack were used, which might not be for some hours afterwards, and perhaps not for some days. The excrement thus carried back and deposited would thus have time to dry and corrode before a flush of water was sent into the pipe from the adjoining closet to send such filth away. Therefore, all minor branches into a main branch having only a slight fall, should be made to enter at the side obliquely, and never at right angles to or on the top of the main branch. The junction should be kept well up from the bottom or bed of the main branch pipe, to prevent any matter flowing into the minor branches when travelling through the pipe. It was also an evil to continue on the chief branch pipe for ventilation above the highest of the minor branches, for the discharges from the latter would splash and flow up towards the open end of the chief branch pipe, especially if more than one water-closet was discharged at one time, and as there would be no water-traffic through that part of the main branch, it would not only become foul, but would be liable to stoppage,—at any rate, sufficiently so to prevent proper ventilation. No ventilating-pipe should be taken from a waste-pipe, soil-pipe, or drain, at a point which could be closed up by a stoppage or back-flow in the pipe,—*i.e.*, the ventilating-pipe should always be connected to the waste-pipe, soil-pipe, or drain in such a way as to make it difficult for discharges sent through such pipings to reach the mouth of the ventilating-pipe to choke it, and the connexion should be so made that if anything splashed up into the ventilating-pipe it should readily fall back, or drain itself out again. How often did one see a range of lavatory basins fitted up with the branch wastes from them entering the top of the main branch at right angles! When a basin near the main waste in such an arrangement was emptied through a minor branch into the main branch, the contents of the basin would flow both ways, and the suds would hang about the pipe and corrode upon it unless the basin farthest from the main waste were immediately used. Another evil attending such an arrangement was that there would be a constant circulation of the vitiated air in the main branch from basin to basin, and such bad air, arising from stale soap-suds and other matter adhering to the sides of the pipe, would be breathed by the persons bending over the basins to wash their hands; for in the "tip-up" basins the impure air would easily come up between the basin and the "receiver," and in plug-basins (though the plug might be in its place) the air would easily escape through the overflow arm. Another error often made in the arrangement of lavatory wastes, where a range of basins discharged into one trap, was in taking the main branch into the heel of the trap in such a way that about two-thirds of the length of the main branch always was full of water. When that was the case, how was it possible to change the "standing water" of the trap and the waste-pipe with a flush of water sent through either of the basins? The body of water standing in the trap and piping might become very offensive from the use of scented soap and the washings-down of the lavatory top, and it would prevent the waste-pipe from being cleansed, for no flush of water could be sent through the pipe with any cleansing force. When a waste-pipe from one "fitting" was branched into the trap fixed under another fitting, the connexion should be so made that no air could travel from one fitting to the other, as it easily could under arrangements sometimes adopted. If one trap must be made to receive the waste-pipes from more than one basin, sink, bath, or urinal, when fixed adjoining each other, the ends of such pipes should be taken into the trap under the normal level of the standing water. But, even that arrangement, though it might do for certain places, was imperfect in principle and faulty in detail, and therefore should never be carried out in fixing sanitary fittings near a living-room or bedroom. In dressing-rooms it was common to find the lavatory-waste connected with the bath-waste, but it was impossible to keep such arrangements absolutely sweet. When two or more waste-pipes discharge into one trap, with

* For reports of the previous lectures see the *Builder*, vol. xl., pp. 651, 711, 775; and current vol., pp. 27, 87.

their ends under the water-line, the filth carried down one pipe floated up into one or more of the other pipes, and collected and lodged there. Though the matter sent up in that way might only be small in one usage, it became large from repeated usage. The lavatory would most likely be in constant use, but the bath might not be used more than two or three times a week, and when used the discharges from it would not wash out the dried filth, for that would have collected upon the sides of the dip, and of the bath-waste, above the discharging orifice. Besides, in such arrangements, a large trap was often used, with small branch-wastes into it from the adjoining fittings, so that the trap could not get properly cleaned out by a flush of water sent into it through such pipes. In such cases, filth collected very quickly in the dip or inlet part of the trap. When, on the other hand, each fitting had its own trap, the water flushes through it could be made to cleanse every part of it, provided that the water-way from the fitting into the trap was of the same bore, and that the trap was of a self-cleansing form,—*i.e.*, a round-pipe trap.

Waste-pipes and Overflow-pipes from Water-closet and Bath Safes.—It was still the practice with many country plumbers, where they fixed safes under water-closets, to connect the waste-pipe of the safe with the water-closet trap, and to fix the pipe of too small a size to be of any value in any great overflow of the water-closet. But, supposing the pipe to be large enough to take away any overflow from the closet or leaky supply valve, its connexion with the trap of the water-closet, where the stoppage which had caused the overflow had occurred, would prevent the water getting away, and the safe would be of no good in preventing the water from overflowing and doing damage. But the chief evil in such an arrangement was that excremental matter would flow up into the safe and waste-pipe from time to time, fouling the pipe where it would have no chance of being cleaned out again, and every usage of the closet would cause a disturbance of the water standing in the pipe, and make it smell. The evil was much aggravated when the pipe was connected to the cheek or heel of the water-closet trap with its orifice partly above the level of the standing water, for soil-pipe air would then readily escape through the waste-pipe of the safe into the house. The system of fixing a separate trap under the safe, and taking the waste-pipe from it into the soil-pipe, was radically wrong, though it might, with a "weeping" pipe to charge it, be an improvement on the method last mentioned. But, in a tier of water-closets, such traps often got syphoned, and then they became inlets for bad air to the house, and might continue for hours, and even days, unsealed, and all the time the air from the soil-pipe would be escaping into the house, for the water-closet with which they were connected might not be used for days together to recharge them. The only safe way of fixing safe-wastes was to connect a 2 in. or 1½ in. lead waste-pipe to the safe, and carry it through the external wall, leaving its end open for ventilation, except where birds were likely to build in it or where the frosty air could blow through it to freeze the service-pipe to the water-closet or the water-closet itself. There was very little fear of that when the ends of such pipes faced the south, and when the service-pipes were protected; but where the ends of overflow-pipes were open to the north or north-east, the air whistled up the pipe and froze the basin water,—perhaps breaking the basin and bursting the pipe. It was, therefore, better to solder a brass or copper-hinged flap on the ends of such pipes to shut out the frost and to prevent birds building in them. When, however, such pipes could be left open, they helped to change the air in the room, with a few perforations in the water-closet seat. Of course, where that was done the space between the top of the basin and the seat must be packed with india-rubber to prevent any draught coming to the occupant; and when there was any frost in the air, a piece of board could be placed over the mouth of the overflow-pipe, but that needed personal attention. The mouth of the overflow-pipe should be enlarged and soldered to the safe, and the "outlet" end should be kept at least a foot below the level of the safe, so that the weight of the overflowing water might well open the hinged flap where the latter was used. Overflow-pipes to safes under baths or slate or galvanised iron cisterns should be treated in the same way as overflow-pipes to water-closet safes,—*i.e.*, a pipe of sufficient size to take off the supply of water to such fittings should be fixed to the safe, and carried through the external wall to discharge, with an open end outside; and, to prevent such wipes becoming inlets to the house for bad air, the ends should be kept well away from all ventilating-pipes to waste-pipes and drains, and from places where any bad air could reach them. Where stop-cocks were used for supplying a bath with water, or where any supply-valve by leaking dropped its water into a safe, provision should be made in the connexion of the bath-waste with the safe for taking off such leakage, for if it were allowed to run down the overflow-pipe in frosty weather, the word "safe" would be a misnomer, for the dropping water would freeze up the outlet of the overflow-pipe, and then, if an overflow took place, it would soon flow over the safe on to the ceiling.

Cistern Wastes.—Waste-pipes from cisterns should never be connected with any other kind of pipe. As described for overflow-pipes from cistern safes, waste or overflow-pipes from cisterns should discharge into the open air, well away from all places where any impure air could reach them, for when they discharged over a gully or any other drain trap, they acted as air-pipes from such traps. Any drain air passing through the trap (caused by the water in the trap having evaporated or by the disturbing action of discharges into the trap) would pass through the waste or overflow pipe to the water in the cistern, and contaminate it. It was also a great evil to discharge a waste or overflow pipe from a cistern into a rainwater-pipe with which might be connected a sink or lavatory waste, for such rainwater-pipe was sure in time to become foul, and the bad air arising from it would readily escape through the cistern-waste to the water in the cistern. It was all very well to blame water companies for not supplying pure water, but when no great trouble was taken for keeping the water pure,—should it ever come into the cisterns pure,—we could not very well be angry with the water companies. The other day he was called in to examine the sanitary arrangements of a house which had recently been overhauled and reconstructed. He found about four-fifths of the work well done, but among one or two things imperfectly done was a cistern-waste. The pipe had been disconnected from the water-closet-trap and continued and made to discharge over a rainwater head. The cistern itself was on the attic-floor, and placed in a corner of the servant's bed-room. He was not then considering the position of cisterns, so he would say nothing about that, except that the water stored in such a quarter must get contaminated. The waste-pipe acted also as an overflow-pipe, and being thus open at both ends, there was nothing to prevent the foul air from the four or five lengths of rainwater pipe over which the waste-pipe discharged, passing to the water in the cistern. The combined sink-waste and rainwater-pipe emptied itself into a large gully-trap in the back area of the house, and as such traps, as was shown in a previous lecture, were non-cleansing, every time the water was disturbed a bad smell was emitted, which partly escaped through the window just over the trap into the house, and partly found its way up the four or five lengths of foul waste-piping, and thence through the cistern-waste, to contaminate the water in the cistern and the air in the servant's bedroom. A branch waste from a sink on the third floor was taken into the combined sink-waste and rainwater-pipe, but the branch was trapped, showing that the plumber or director of the work had an idea of such piping becoming foul; but the mystery was why he carried such a pipe as a cistern-waste into it. Cistern-wastes, he repeated, should discharge themselves well away from all traps and ventilating-pipes. When they could not be made to discharge into a roof-gutter, or on to a flat or yard, and when the only place that could be found was a rainwater-head, the standing pipe in the cistern should be treated as a plug, by soldering over its top, and an overflow-pipe to the cistern should be fixed to the cistern as described for the cistern-safe, care being taken that such pipe was of sufficient size to take off the full supply of water to the cistern. If the workman erred in this matter he should err on the side of largeness.

Disconnexion of Drains from Sewers and Cesspools, and Drain Ventilation.—No drain was properly connected with the sewer (or cesspool, as the case might be) which would allow the sewer or cesspool air to get into the drain unless it was very largely mixed with the atmosphere. Every drain should be trapped off from the sewer by an efficient and self-cleansing trap, and, immediately on the house-side of such trap an air induct pipe should be fixed to the drain; or, better still, if circumstances would admit of it, a large air-shaft should be built from the bed of the drain to the surface-lead of the ground, for the upper part of the drain at such point to be well open to the air. Where the drainage of the house had been carried out on the principles laid down in these lectures, there was no risk in opening a well-ventilated drain to the air, provided the trap used for such purposes was a self-cleansing one, having a good water-seal (to allow for evaporation), and provided, also, that it was only of such a size as to admit of the whole of its standing water being changed by a flush of water sent through the drain. But to fix such an arrangement—say, for instance, in the area of a London house,—and to connect it to an old brick drain, saturated with sewage matter, and of such a size that no amount of water that could be sent into it would flush it; or to fix it even to a pipe-drain too large to be flushed out, and, therefore, too large to be kept wholesome, was to run a great risk of getting intolerable stinks at such openings. It required good experience in such matters to treat open drains successfully; but to fix a 9 in. trap where a 6 in. would be ample, or to fix a 6 in. where a 4 in. would suffice, was to run a risk of getting bad smells into the house if the latter was near such openings, for the contents of the trap would under such circumstances only rarely be entirely changed. Where the outlet end of the drain into such traps could not be left open to the atmosphere, —for various reasons, as, for instance, being an old drain which could not be properly flushed out, or because the opening would come directly under or near a window, or close to an opening into the house, or under a covered way where any bad air emitted from the trap or drain would get pent up, to enter the house directly a window or door near the place was opened,—then, in such cases, the opening over the top of the air-shaft or trap should be sealed up, and an air-induct pipe taken into it for the admission of fresh air into the drain from a point well removed from the house. Where the end of such induct-pipe could not be kept well away from the windows, doors, or passenger traffic, a mica-valve should be fixed over its mouth to prevent, as much as possible, any drain-air escaping through it; or, the induct-pipe could go up to the roof, but in the latter case the pipe should be kept lower than the up-cast pipe of the drain, so as to obtain better results from it. Though the plumber might have nothing to do with fixing such a trap for disconnecting the drain from the sewer, he had generally to do with the ventilating pipes of the drain, for in most cases he was called upon to fix them, especially when they were of lead; and as no drain was properly ventilated unless the air in it was changed, and as that could not be done without an inlet as well as an outlet, the plumber's knowledge of drainage matters ought to extend as far as the sewer. Not that he should be required to plan the drainage of a house, but his knowledge of sanitary matters should be such as to lead him to carry out every part of his work in an intelligent manner. If sewer air were allowed to pass freely into the drain, the whole atmosphere surrounding the upper portion of the house,—where the plumber terminated the ventilating-pipes of the drain,—would become contaminated, and such vitiated air would often get sucked into the house. If such smells were sufficiently pronounced to call special attention to them, they might get set down to imperfect plumbing; at any rate, there would not be great wisdom in making the plumbing sanitarily perfect, and leaving the drains imperfect, for if a man was to be made ill by breathing polluted air, it might as well come from defective plumbing as from defective drainage. He supposed that at the present time the larger proportion of the house drains of the United Kingdom were unventilated, and the other portion only imperfectly ventilated. In the scheme of house drainage of which he exhibited a model, he had disconnected each stack of soil and waste pipe, thereby localising each of them; and that each pipe, as well as the drain, might be perfectly ventilated, he had given each its own inlet and outlet; in fact, he had treated them in the model as they ought to be treated in practice so as to secure

a perfect ventilation throughout the whole system. In fixing ventilating-pipes for upcasts to drains, care should be taken to keep them well above and well out of the way of all openings into the house, as explained under the head of soil-pipe ventilation in the previous lecture, so that the bad air coming out of such pipes might not get into a house through a chimney, skylight, dormer-window, or any other opening. It would really be amusing, were it not for the serious consequences likely to arise, to take note of the ill-considered positions in which such pipes were terminated. Sometimes they were seen placed where no wind could reach them at all; at other times they were left so that the smallest wind might blow the air emitted from them right into a window; and in other places, by crossing and re-crossing the roof, they were carried up some tall chimney-stack and terminated at a point so situated that the slightest downward pressure of the atmosphere pressed the bad air from such pipes down the chimneys into sleeping or other apartments! No ventilating-pipe from a drain should be fixed inside a house if it was at all practicable to fix it outside. To prevent the possibility of drain-air escaping into a house from a ventilating-pipe through a leaky joint, broken pipe, nail-hole, or any other defect, such pipes should be fixed outside the house. When such pipes were of lead, and were wanted to stand for a century or centuries, as leaden rain-water pipes would, they should be kept out of the power of the sun as much as possible, for with soldered joints the pipe would have no freedom for expansion or contraction, as in leaden rain-water pipes with slip socket joints.

Value of Good Water-Flushing. — If water carriage was to be the system of removal, water must be used freely. If the slops and sullage of a house were to be effectually removed, whatever else might be limited in a house, water must not be. To make water the cleansing power of waste-pipes, soil-pipes, and drains, and then to limit its use, would be to leave the filth lodging, decomposing, and corroding in the pipes. How we should ridicule a vestry board which sent a street scavenger to clean Regent-street, say, with one sweep of his broom, to begin at one end and push it right through the centre of the street to the other end. And yet such a swept track as that represented the treatment a soil-pipe often got. The pipe was befouled all over by an offensive excremental discharge sent into it, but the water used for washing out the pipe was only sufficient, in many cases, to cleanse a channel down its sides. A pailful of slops, collected from chamber utensils, was thrown down a water-closet in a body sufficiently large to foul the whole of the soil-pipe belonging to the closet, and, at the same time, a water-waste preventing valve was opened for two gallons of water to pass into the closet to cleanse it; but the water, squirting into the water-closet as if it came from a boy's syringe, was of little value for cleansing the pipe, as it did not cover the whole of the parts fouled, and the parts unwashed became coated over with excremental matter, corroding up the pipe and making it unwholesome. The real cause of pipes stopping up was the want of good water flushing. It would be possible to stop up a 6-in. pipe to a water-closet or urinal with a bad supply of water to it, quicker than a 3½-in. one with a good supply of water. No waste-pipe, soil-pipe, or drain could be kept wholesome unless adequate flushes of water were sent through it immediately after discharging dirty water or excremental matter into it; and before such discharges were sent through the traps they ought to be largely diluted with water, — especially in such cases as the contents from chamber-utensils. Measure water into slop-sinks and water-closets by the table-spoonful, and whatever else might be clean and wholesome about the house, such fittings with their belongings would not be. He knew that it was possible to utilise two gallons of water, — the quantity allowed for water-closets by the London water companies in accordance with the Metropolis Water Act of 1871,—in such a way that it should pass into a closet with greater cleansing power than twice that quantity badly supplied, but that was not the point now in question. He contended that two gallons of water were insufficient for keeping a water-closet and its belongings wholesome, and he was speaking to a body of practical men whose opinion on the matter he should be glad to hear. Were there ten men in the room who considered a two-gallon water-flush sufficient to cleanse a water-closet, basin, trap, soil-pipe, and drain after usage? ("No.") They must knock at the door of Parliament, and send in a message stating that a large body of practical plumbers found from experience that two gallons of water were insufficient to keep a "house of commons" wholesome, and that, if more water could not be allowed, such places must be abolished. Even when plenty of water could be had, however, the flush was often interfered with by bad appliances. The supply-valves, instead of being equal to flushing-out a 4 in. or 4½ in. soil-pipe, were often only of sufficient size to cleanse a 1½ in. or 1¼ in. pipe; or perhaps the boiler-screw or cistern connexion was of smaller diameter than the service-pipe, and the water was, so to speak, "wire-drawn" through it. Having called attention to Mr. Rogers Field's flushing-tank as a valuable means of flushing-out the drains of a house automatically, the lecturer went on to say that the question of flushing was a very important one, for though ventilating-pipes from drains and soil-pipes might be carried up above the roof, the stink coming from them, where the drainage pipes were not thoroughly flushed, would be so great that the whole of the atmosphere surrounding our dwellings would at times become largely charged with the bad air emitted from such pipes, and though such bad air would no doubt get largely diluted before it was breathed, in great cities,—at any rate, in a huge city like London,—it would pass at times pretty freely into houses. When the drainage of London houses was properly ventilated,—*i.e.*, when every waste-pipe, soil-pipe, and drain had its ventilating-pipe, the number of such pipes would be enormous,—hundreds of thousands. How important, therefore, was it that the stink coming out of such pipes should be minimised by efficient flushing. Having dwelt on some other points, including the supply of water to urinals, the arrest of grease before it passed into the drains, precautions to be taken against pipe-freezing, the storage of water (recommending, by preference, slate cisterns for water intended for dietetic and potable purposes), and the construction and finishing of water-closet rooms, the lecturer made the following observations as to a

Suggested Code of Rules for House Sanitation. —Various opinions were now before the public as to the best method of draining a house. Several had been referred to during the lectures, and he would simply say, in concluding his remarks on "the science and art of sanitary plumbing," that it was about time that the opinions of sanitarians on such matters should be consolidated. The principles of house drainage were so far determined upon that there ought to be no great difficulty in framing a good sanitary code as a general basis to work from. He would have the boundary lines of such a code marked out with silken cords rather than with iron bands; for, like all new things, sanitary knowledge should have room to grow. He believed it would be just as easy for a tailor to make a suit of clothes to suit all climates as it would be to lay down a code of sanitary rules to suit all cases. If he had to draw up such a code of rules he should make them read somewhat as follows, viz.:—

1. That pure water shall be supplied to every house for dietetic purposes, and where this water cannot be drawn direct from a constant supply, it shall be stored in cisterns easily accessible for cleansing purposes; and such cisterns shall be so placed that no vitiated air can reach them, either from the house, water-closets, or ventilating-pipes,—from waste-pipes, soil-pipes, or drains.

2. That no draw-off cock to any sink or "fitting," other than a water-closet, shall be supplied from a cistern fitted in a water-closet, or standing in a place where any contaminated air can reach it, or from a cistern or service-pipe which also supplies a water-closet.

3. That every drain shall be trapped off from the sewer by a self-cleansing intercepting sewer trap, fixed in every case outside the house; and where the mouths or inlets of such traps cannot be left open to the atmosphere, air-inlet pipes should be taken into the drain immediately on the house side of such traps.

4. No drain shall enter the walls of a detached or semi-detached house.

5. In a line of houses, as in terraces and streets, where it is impossible for the drain to reach the soil-pipes without coming inside the house, such drain shall be of cast-iron, heavy water-main strength, and this pipe shall be "Barffed" or coated with solution, and laid in a brick trench, or fixed on the face of the basement walls, and its joints well caulked with lead. The drain shall be so ventilated that not a foot of it shall be without a free circulation of air through it.

6. Every drain from a house shall be so ventilated that no stagnant air shall remain in any part of it; and where this cannot be done by air-shafts, ventilating-pipes shall be fixed, and the drain divided into sections, and its branch drains, when of great lengths, localised, so as to ensure ventilation in the entire system of drainage.

7. All soil-pipes, where practicable, shall be fixed outside the house, with their discharging ends exposed to the atmosphere,—either directly by emptying into open traps, or indirectly by foot ventilation; and such pipes shall be carried up to the highest points of the roof full size, for proper ventilation, having their terminals well removed from all openings into the roof or house.

8. All dirty-water wastes from sinks, baths, lavatories, &c., shall discharge themselves with open ends into intercepting traps fixed outside the house, and such pipes shall be continued up through the roof full size for ventilation.

9. All clean water wastes,—from cisterns, cistern-safes, &c., shall be kept separate from other wastes, and shall discharge with open ends into the atmosphere, well away from all drain traps or places where any bad air can reach them.

10. All wastes or overflow-pipes from safes under water-closets, baths, &c., shall be kept separate from other waste-pipes, and shall be made to discharge in the open air.

11. Every sanitary "fitting" fixed inside a house where foul matter, or contaminated water, is passed into it, or from it, shall have its waste-pipe trapped off from the house, and such trapping shall be made immediately under such "fitting."

12. All traps fixed inside the house shall be self-cleansing; and no trap which fouls itself or is not easily flushed out shall be used on the drainage outside the house.

13. All traps to water-closets, slop-sinks, sinks, baths, lavatories, &c., which can have their water syphoned out by the use of any fitting upon a pipe in connexion with them, or by the use of themselves, shall be ventilated, to prevent such syphonage, and also to allow of the branch pipes being ventilated.

14. No sanitary fitting shall be fixed which will not allow a good flush of water to be sent through it to cleanse it and its belongings, to prevent any pipe from it,—be it a waste-pipe, soil-pipe, or drain,—from getting unwholesome.

15. Every house shall be provided with proper and efficient means for flushing-out the whole of its drainage.

16. The walls inside water-closet seats, the floor, and the walls of water-closets, should be made air-tight to prevent any odours in them passing to any room adjoining through a crevice, crack, or opening.

17. The rooms of water-closets should be well ventilated, so that a constant change of air may take place in them.

In conclusion, Mr. Hellyer observed that whatever charge might be laid against journeymen plumbers, want of interest in their trade could not be alleged against them, for he questioned if the members of any other branch of the great building trades would have come out night after night, during the hot time of summer, to listen to dry lectures. Lying in their strong arms, slumbering in their hardened muscles, resting in their well-trained fingers and educated hands, was, in a large measure, the health of this leviathan city. The plumber's part in making a house, a town, a city, healthy, was enormous. He believed that if plumbing work was done on the principles laid down in his lectures, this huge city, teeming though it was with human beings, would become the healthiest, as it was now the greatest, city in the world. Let the plumbers of to-day seek to do their work in the very best way possible, so that their successors in a future age might say,—"How well the plumbers of the latter part of the nineteenth century did their work!"

The chairman addressed a few observations to the meeting. He said he considered Mr. Hellyer's lectures to be of the greatest possible value and interest, not only to the craftsmen of the plumbing trade, but to the public at large. Those who had watched the progress of sanitary reform knew that it was only by repeated efforts that reforms were initiated and the apathy of the people with regard to them aroused. He thoroughly endorsed what Mr. Hellyer had said as to the necessity of knocking at the door of Parliament, and he, for his own part, had urged the appointment of a responsible Minister of Health. Health was of at least as much importance as trade and other matters which engrossed the attention of separate Ministers. During the last few years the importance of house sanitation had been increasingly recognised, and he thought the time had come when legislation on matters of health should, on all vital points, cease to be permissive. In America, where great attention had been paid to the subject of late, a Bill had been passed, called the Plumbers' Bill, making it penal for any work of a sanitary nature in a house to be done badly. He thought a similar measure was much needed in England (loud cries of "No, no," from one or two persons in the meeting). He was sorry if he had trodden upon anybody's corns, but such was his opinion. In conclusion, the chairman announced that the National Health Society had arranged to hold a meeting for the discussion of Mr. Hellyer's lectures on Monday, August 15, when Mr. Ernest Hart is expected to preside. It is desired that all who may wish to take part in the discussion should send their names to the secretary of the society, No. 44, Berners-street, W.

A vote of thanks to Mr. Hellyer for his lectures concluded the proceedings.

The lecture was repeated on Friday, the 29th ult., Mr. H. H. Collins, F.R.I.B.A., in the chair.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

The annual meeting of this association has been held this year at Chepstow.

The Rev. W. Bazeley read the report of the Council. There were at present 433 annual members and seventy-two life members, giving a total of 505 members. During the past year thirty-three new members had been elected, whilst the society had lost twenty-two members by death or resignation. The income of the society, including last year's balance, amounted to 240*l.* 12s. 2d. The expenditure amounted to 126*l.* 13s. 7d., leaving a balance of 113*l.* 18s. 7d. Besides this balance the society had a funded balance of 412*l.* The report referred with regret to the death of the late Professor Rolleston, who had rendered great assistance to the society, and then related the proceedings of the year. The council recommended the re-election of the various officers, with the following additions or alterations:—Mr. W. C. Lacy, vice-president (Gloucester); Mr. W. Leigh, vice-president (Stroud); Mr. H. Deane, local secretary for Stroud district; and the Rev. A. Loxley, local secretary for Fairford. The council had to report the resignation of their treasurer, Mr. Christopher Thomas, through pressure of other engagements. The council had reluctantly accepted his resignation, and had expressed to him its cordial thanks for the services he had rendered to the society, and for the interest which he continued to take in its welfare. It had also requested him to accept the office of vice-president at Bristol, now vacant. Mr. Gillet, of Gloucester, was nominated as treasurer, in the place of Mr. Thomas. The following members of the council retired, but were eligible for re-election:—Sir John Maclean, Rev. Dr. Caldicott, Rev. Prebendary Scarth, and Messrs. Adlam, Crawshay, and Lang.

On the motion of Mr. W. J. Stanton, M.P., seconded by the Rev. J. B. Green, the report was adopted.

The Rev. Fielding Palmer proposed, and Major Cowburn seconded, the re-election of the members of the Council, which was carried unanimously.

On the motion of Sir Wm. Guise, a vote of thanks was passed to the outgoing president.

Mr. J. E. Doringtон thanked the members, and introduced his successor, Sir John Maclean, who was received with applause.

Sir John Maclean then delivered his inaugural address. He referred to the interest attaching to the study of archæology, and to the fact that it was becoming more and more popular. The study of archæology might be divided into two eras, the pre-historic and the historic. The former was divided into three periods, known as —first, the stone age; second, the bronze age; and third, the iron age. He then alluded to the discoveries made in the last thirty years in the elucidation of the history, the state of art, and the degree of culture of the ancient empires, especially to the discoveries of Layard, Rawlinson, Smith, Wood, Schliemann, and others. He afterwards referred to the ancient remains of our own country. Gloucester was particularly rich in them. The long barrows almost wholly found on the Cotteswold hills showed that these high lands were somewhat thickly populated at a very early period. He also gave some interesting particulars concerning the Forest of Dean. He was not aware that it contained any pre-historic remains of a definite character. That the Romans occupied the district between the Severn and the Wye was clearly established by the roads by which the district was traversed, by the coins and other articles found in the old iron workings and elsewhere, and by the remarkable remains which still existed at Lydney Park. He dwelt upon the importance of the greatest care being exercised in the restoration of our ancient parish churches, adding that the manner in which some of them had been "restored" made one sick at heart.

After luncheon at the Beaufort Arms Hotel, the members repaired to Chepstow Castle, where Mr. G. T. Clark, of Dowlais, gave an interesting description of its history. Chepstow Church was also inspected, and afterwards there was a carriage excursion to Beachley and Sedbury-park, at the latter place Offa's Dyke being inspected and the president making some remarks upon it. After this the members partook of tea at the residence of Mr. S. S. Marling. Returning to Chepstow, they dined together at the Beaufort Arms.

The members met in the evening at the hotel, under the presidency of Sir John Maclean, who read some "Notes on a Hiding-place found at English Bicknor." He said that in the week preceding Christmas, 1880, some men, whilst levelling down a rocky bank in a steep field on the glebe at English Bicknor, discovered a cavern, which had evidently been fitted up with considerable care as a place of concealment. It was oval in form, 6 ft. high, 6 ft. in length, and 4 ft. or 5 ft. in breadth. The entrance was low and narrow, allowing just sufficient room for a man to creep in. The cave was quite concealed, and it was evidently a carefully-prepared place of retreat. A number of relics were found. It was supposed that they were of the date of Charles I., and that the cave was the hiding-place of some unfortunate Royalist in the time of the Civil War.

The Rev. W. Bazeley (one of the general secretaries) read a paper contributed by the Right Rev. E. Twells, D.D., on "The Cistercian Order."

The Rev. John James followed with a paper describing a leaden tablet lent by Mr. Charles Bathurst, of Lydney Park, for the temporary local museum of the present meeting. The speaker, reading and translating the Latin inscription on the tablet, said it was one of the most curious of the Anglo-Roman remains which had been discovered on the heights of Lydney camp. The ring to which it referred had been recovered and identified at Silchester.

The Rev. R. Hall read a paper on "Local Names in the Forest District."

Sir William Guise being appealed to to make some remarks on the paper, said there was no subject so full of pitfalls as nomenclature, and none into which philosophers tumbled head over heels so soon as nomenclature, and he declined to follow them.

On the second day, a large party assembled at the Beaufort Arms Hotel in order to proceed to various places of interest in the locality. Breaks and carriages were provided, and about eighty ladies and gentlemen joined in the excursion. The party proceeded *viâ* Tidenham Chase, —a most picturesque bit of country,—to St. Briavels. Here a stoppage was made, and under the guidance of the Rev. W. T. Allen, they inspected the church and castle. The church is a handsome structure, and immediately opposite it are the remains of the castle. The annals of Giraldus state that the Castle of St. Briavels was built in the reign of Henry I. (1100-1135) by Milo-Fitz-Walter, Earl of Hereford, to check the inroads of the Welsh,—who were particularly active in harassing their neighbours in those days,—and to confirm the authority of the Norman kings in this region. Houses have been built round close up to the edge of the old moat. A bit of the latter still remains, the pent stock and *batardeau* forming a roadside pool by the gateway. It is fed by two natural springs from the high ground above. The castle stands, or rather did stand, on a sharp shoulder, not on the summit of the hill. It is built of the Old Red Sandstone brought from the common, which is distant about a mile. The double tower of the gateway entrance is still inhabited, but the remainder of the building is in ruins, and unless something is done to preserve them the walls will very soon be level with the ground. There is a fine old kitchen on the right, inside the gate. The chimney is 9 ft. wide, and there is an iron plate there bearing the arms of Elizabeth. The walls are 9 ft. thick. The original dog-wheel, inside which the dogs ran to turn the spit, still remains. The roof of the twin tower is no longer weather-proof, and its few remaining rooms will soon cease to be habitable; the tower itself will soon rank with the things that have been unless speedily cared for. Having spent a pleasant hour here the party proceeded to Tintern, stopping for a brief period at St. Margaret's Grove in order to inspect a portion of Offa's Dyke. Tintern was reached about half-past one, and the excursionists paid a visit to the abbey. Thanks to the care bestowed upon it by the Duke of Beaufort, the remains are more carefully preserved than is the case with most of these ancient monuments. Mr. T. Blowhill gave an interesting description of the venerable pile. On the return journey to Chepstow, the party visited Piercefield Park, and were entertained to tea by Mrs. Clay.

At the evening *conversazione*, Mr. W. C. Heane contributed a paper on "The Grange in the parish of Flaxley." He said the Grange estate, and a farm adjoining it called Saint White's, were parcels of the possessions of Flaxley Abbey. They were in the parish of Flaxley, but formed an outlying part of it, being separated from the mother parish by the parish of Littledean and part of the Forest. The Grange itself was a three-storied house of Tudor, or, perhaps, Jacobean, architecture. Nowhere on its walls could a date be seen, nor had he found any mention of the building of it. It gave one the idea of not having been completed, but as if it had been intended to build the house to form three sides of a square with a quadrangle in the rear, and that the third side or wing was never built. There was a tradition that part of the house was burnt down, but he could find no evidence of this. It was fast becoming a ruin, as no care had been taken to keep the roof in repair. In 1866, when his father left it, a few hundred pounds would have put the old place in perfect repair, but that was not done.

Mr. T. Henry Middleton contributed "Notes on the Church of Mitcheldean." No part of the existing church, with the exception of the font, appeared to be earlier than the beginning of the fourteenth century. The earlier portion, which belongs to the Decorated period, consists of a somewhat narrow nave, with a south aisle, at the west end of which stands a tower and spire, and opening into the tower on the south side there is a small porch. On the north there were originally two Decorated aisles, but the northernmost of these was rebuilt during the Perpendicular period, probably to gain increased width, when Robert Gryndour founded his chantry here. The eastern part of the chancel is modern, and a vestry has been added to the north-east. A number of modern windows have been inserted of various styles, in some cases not in accordance with the date of the work around them. On the whole, the church is a fine and interesting one, in spite of the loss of its fittings and the thorough "restoration" it has undergone. The earliest feature of the former church is the font, which is Norman, and tub-shaped. The upper half has been lost, and the remaining half is turned upside down, and has the basin cut in what should be the base.

Mrs. Baguall Oakeley contributed a paper "On some Roman Coins found in the Forest of Dean," and the President read a paper on the "Outlines of the History of the Manors and Advowsons of Mitcheldean and Abbenhall."

The concluding meeting was held on the morning of the third day, at the Beaufort Arms Hotel, the President, Sir John Maclean, in the chair.

Sir Wm. Guise proposed that the next annual meeting be held at Stow-on-the-Wold, and that the selection of the President be left to the Council. He said the district he had named had lately been opened up by railway communication, and he believed that there was less known of that portion of the Cotswolds than of any other part, although it embraced one of the most interesting and beautiful parts of Gloucestershire.

Mr. J. F. Nicholls seconded the motion, and remarked that it was a corner of the county of which very little was known, so that it would be very interesting to go there.

The motion was carried *nem. con.*

Mr. Gambier Parry proposed a vote of thanks to the President. He said they all deeply felt the sudden loss of Mr. Granville Somerset, who was to have taken the chair at that meeting, for those who knew him entertained respect, affection, and even reverence for him. They were greatly indebted to Sir John Maclean for accepting the post, and for the ready and efficient support he had given to the society.

The President, in reply, said it was very gratifying to find that his labours had met with their approbation, but the success of the association was more particularly due to the President of the Council, to whom he proposed a vote of thanks.

Sir William Guise, in reply, said he took great interest in the society from the beginning, and it was with great satisfaction and pride that he saw the position they had achieved. He concluded by proposing a vote of thanks to Mr. Palmer Hallett and the Rev. W. Bazeley, the general secretaries, who replied.

At half-past ten the members started on an excursion to Lydney and the Forest of Dean. Some of them journeyed to Lydney Park by road, conveyances being provided for them, whilst the greater number proceeded by rail to Lydney Junction. Here they alighted, and were met by Mr. Lamb, who acted as guide. They first visited the parish church, a fine old building in the Early English style, with chancel, nave,

and aisles, and a square tower, with a finely-proportioned steeple. There are many interesting archæological features in the church. Passing through the village,—or, perhaps, it ought to be termed a town,—the cross in the centre of the cross roads was noted. From the top of the pyramid of steps on which the cross rests the priests in the old time used to preach. The party then proceeded to Lydney Park, the seat of Mr. Charles Bathurst, where the Rev. Prebendary Scarth described the Roman camp, villa, and temple at Lydney. The party subsequently proceeded to the Speech House, where Mr. J. Bellows, of Gloucester, read an interesting paper on "Ancient British Life in the Forest."

NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.

The National Association of Master Builders of Great Britain held their seventh half-yearly meeting at the rooms of the London Master Builders' Association, 27A, King-street, Covent Garden, London, on Tuesday, the 26th ult., when representatives were present from the local associations of the principal towns in the kingdom.

The report and audited accounts for the past half-year were read and adopted. Mr. Clay, the late president, was presented with an illuminated address expressing the thanks of the Association for his past services as president.

The occasion, being important, was embraced by the London builders as a fitting opportunity to entertain their provincial brethren. A numerous gathering dined at the Criterion in the evening. Mr. Stanley G. Bird (the president) occupied the chair, and amongst those present were Mr. R. Neil, jun., Mr. B. Hannen, Mr. Ex-Sheriff Burt, Mr. T. Clay, Mr. G. Plucknett, Mr. W. H. Cowlin, Mr. E. Hughes, Mr. J. Whitcher, Major Waller, Mr. J. Leslie, Mr. C. W. Barker, Mr. J. B. Simpson, Mr. L. J. Maton, Mr. A. Bird, Mr. J. T. McLachlan, Mr. W. C. E. Creswick, Mr. W. Knox, Mr. W. Clules, Mr. Bennett, Mr. Beanland, Mr. Malone, Mr. J. H. Colls, Mr. J. T. Chappell, Mr. W. A. Colls, Mr. H. G. Smith, Mr. A. J. Mansfield, Mr. A. R. Smith, Mr. R. Gurney Hoare, Mr. J. McLachlan, Mr. J. Bradney, Mr. T. E. Phillips, Mr. W. Bird, Mr. C. Bird, Mr. Bonnar, Mr. C. J. Bennett, Mr. A. Thorn, Mr. T. Patrick, Mr. H. Kelly, Mr. E. Kelly, Mr. S. E. Haward, Mr. J. Clemence, Mr. J. Wall, Mr. Barfield, Mr. T. Hook, Major Brutton, Mr. G. S. Pritchard, Mr. R. D. Lown, Mr. H. Dove, Mr. Callaghan, Mr. Nightingale, Mr. J. C. Hannen, Mr. W. Southern, Mr. Kirk, Mr. Randall, Mr. Doulton, Mr. Marsden, Mr. Edwards, Mr. Chambers, Mr. H. Burman, Mr. Little, Mr. Dove, Mr. Collingridge, Mr. Stedman, Mr. Duffield, Mr. Webster, Mr. Adamson, Mr. F. J. Dove, and Mr. E. S. Henshaw.

The loyal toasts were given from the chair, and duly honoured.

Mr. E. Hughes proposed "The Army, Navy, and Reserve Forces," Major Brutton (secretary of the Builders' Benevolent Institution) and Major Waller responding.

Mr. Plucknett gave the toast of the evening, "Success to the National Association of Master Builders of Great Britain, and the health of the President," which was received with cheers. He said that, considering the short period of the society's existence, the results that had been attained were extremely gratifying. Many of the leading builders of the country had already joined them, and he felt sure that motives of self-interest, if no other motives, would induce all the great building firms to enrol themselves in the list of members. He himself looked forward to the time when, through the operations of this Society, strikes and lock-outs would be things of the past. With the toast he desired to couple the name of their president, Mr. Stanley G. Bird, who had worked zealously for the objects of the Association, and without whose courage and perseverance at the commencement he doubted whether it would ever have come into existence.

Mr. Bird, who was heartily cheered, said he felt himself justified in declaring that the Association of Master Builders had already rendered to the trade services of a most important character. He doubted, however, whether it was possible yet to foretell the happy period when strikes should be an end; on the contrary, he believed that with a return of prosperous times their troubles would commence again. At that time, however, the trade generally would understand the immense advantage of being able to refer their difficulties to such an institution as this. Alluding to specific objects that had already been attained through the instrumentality of the Association, he mentioned a new form of contract, and the establishment (arising out of the Employers' Liability Act) of the Builders' Accident Insurance Company.

Mr. Hannen gave "The Local Associations of Master Builders," insisting upon the advantages rendered by these institutions.

Mr. R. Neil and Mr. W. H. Cowlin replied.

Mr. Clay responded for "The Visitors."

PROPOSED ARCHÆOLOGICAL CONGRESS AT MALVERN.

In 1848 the British Archæological Association held its fifth annual congress at Worcester, and in August, 1875, its thirty-second annual meeting at Evesham, in the same county; notwithstanding these two visits, the ground that it is now proposed to explore in the neighbourhood of Great Malvern contains many objects of archæological interest probably but little known to the members and visitors who will attend this, the thirty-eighth annual meeting of the Association.

Malvern has been described, justly enough, by Horace Walpole and others, as one of the most beautiful and picturesque localities in Great Britain. It embodies in itself and immediate neighbourhood events and episodes connected with many remarkable epochs of our history, and notably with the great civil struggles of the Wars of the Roses and the later deadly conflicts at Edge Hill and the city of Worcester, contests fraught with consequences of the deepest import for the then future glory of our country, the study of which presents features of unusual interest to the archæologist and historian. The council of the British Archæological Association gladly availed themselves of the encouragement offered by the late lamented Mr. Chance and other leading inhabitants, to hold their thirty-eighth annual congress at Malvern, through their hon. congress secretary, Mr. George R. Wright, F.S.A., who, with a view to carrying it to a successful issue, has been making all requisite arrangements, in conjunction with an influential local committee, of which the hon. secretaries are Messrs. W. Tyrrell and Edward Nevinson.

The opening day at Malvern, Monday, August 22nd (after the inaugural address of the President, the Very Rev. the Lord Alwyne Compton, D.D., Dean of Worcester, at 3 p.m.), will be chiefly dedicated to an examination of the Priory church, founded *circa* 1080. This portion of the once much larger edifice, and which has been used as the parish church of Malvern since the days of Queen Elizabeth, presents, in its mixed styles of Early Norman and Late Perpendicular work, many features of interest and beauty, and as far as its famous painted-glass windows are concerned, is considered to be unrivalled by any other ecclesiastical edifice in the world. In the evening there will be a public dinner at the Imperial Hotel, to which ladies are specially invited.

In addition to the week's work at Malvern, it is intended to visit Worcester on the following Monday and Tuesday, August 29th and 30th, and thus again pay a tribute of respect to the new beautifully restored cathedral, and to the many other objects of antiquarian interest to be found within the time-honoured walls and neighbourhood of the city of Worcester.

The Mayor and Corporation of Worcester have, with characteristic kindness, already offered every facility to the Association for the purposed visit to their city; and the Worcester Diocesan Architectural and Archæological Society have also signified their wish to co-operate with the Association, both at the Malvern meeting and at their own ancient city.

On Wednesday, August 31st, it is proposed to go to Cheltenham for the purpose of examining some of the MSS., rare books, and pictures, at Thirlestane House, which were collected by the late Sir Thomas Phillipps, bart. These, by the kindness of the Rev. J. E. Fenwick, M.A., will be placed before the members and visitors, and explained to them by Mr. E. Maunde Thompson, V.P., F.S.A., keeper of the MSS. British Museum. Afterwards visits will be made to Leckhampton Church, Prestbury, and Bishop's Cleeve.

During the Congress week at Malvern, excursions will be made by carriages and railway to Birtsmorton Court, a moated manor-house of the fourteenth century: the adjoining church; "Payne's" Place, where Margaret of Anjou took shelter; Tewkesbury battle-field; the restored Abbey Church and old houses at Tewkesbury; Severn-end Manor House, Brockeridge-common, Ripple Church Twining, Bredon Church and Tithe Barn and Bredon Hill (king and queen stones and camp), Bosbury and Ledbury Churches, Wall's Hill Camp, Much Marcle and Kempley Church, the latter having some good frescoes on its walls, discovered a few years since; Kidderminster Church, Warshill (close to Habbersley), Bewdley, Ribbesford, Areley Kings for Manor House, &c.; Redstone Hermitage and Astley Church, thence to Moor Hall, by the invitation of Mr. John Brinton, M.P., who will take charge of and conduct the party on the Kiddermiuster day; Little Malvern, Herefordshire Beacon, and Midsummer Camp, an ancient British fortress of large extent; Branshill Castle, a Norman stronghold; and Eastnor Castle and Park, by the kind permission of the Earl Somers, &c.

Meetings will be held every evening in the schoolroom of the college, by the courtesy of the authorities, at half-past eight, for the reading and discussion of Papers, after the opening day, and all members or visitors desirous of contributing papers on local or other archæological subjects are requested to communicate at once with the hon. secretaries, Mr. E. P. Loftus Brock, F.S.A., 19, Montague-place, Russell-square; or Mr. W. de Gray Birch, F.S.A., British Museum, Bloomsbury.

THE PROPOSED NEW WORKHOUSE AT CHAMPION HILL, DULWICH.

There appears a probability that the proposal of the St. Saviour's Guardians to erect a large new workhouse at Champion Hill will not be carried out, although the land has been purchased for the purpose. It is a matter of notoriety that the proposal has met with the strongest opposition on the part of the owners and occupiers of property in the locality, and now the several parishes interested are taking steps to prevent the erection of the building, which, it is stated, would cost something like 200,000*l*. The parishes comprising the Union of St. Saviour's,—Newington, St. George's, Christchurch, and St. Saviour's,—are about to be called together by delegates to take into consideration the great outlay contemplated by the erection of the proposed building.

COMPETITIONS.

New West St. Giles's Church, Edinburgh.—The competing plans for this new church were submitted to Mr. John Macvicar Anderson, hon. secretary of the Royal Institute of British Architects, for his opinion. That gentleman has now reported in favour of the design by Messrs. Hardy & Wight, 7, St. Andrew's-square. The style of the building which Mr. Anderson recommends for adoption is Gothic of the Decorated period, with tower and spire, 160 ft. high. The spire is slender in its proportions, and rises from a parapet of open quatrefoil-work, similar to the work in old St. Giles's tower, with flying buttresses at the angle pinnacles. The church shows a nave, aisles, and transepts, the arcade supported on polished pillars of red granite. Accommodation is provided for 1,000 persons, the cost not to exceed 7,000*l*.

Gateshead Workhouse.—At a meeting of the Gateshead Board of Guardians, held on Tuesday, the 19th ult., the designs submitted in open competition by Mr. W. Lister Newcombe, F.R.I.B.A., of Newcastle-upon-Tyne, for proposed additions to the Workhouse, Union-lane, were selected as the best, and received the first premium.

Lincoln's-Inn Chapel.—We are informed that in extending Lincoln's-inn Chapel westward, with a new staircase and vestries, in general accordance with the late Sir Gilbert Scott's design, made in contemplation of the removal of the old and almost ruinous chambers which enclose the end of the chapel, and contains its staircase, Mr. Salter, who designed the last alterations at King's College, London, and at St. George's Hospital, is employed as architect. Messrs. Longmire & Burge's tender has been accepted to complete the work in fifteen months.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,091. T. R. Harding and T. W. Harding, Leeds. Fluid meters. July 15, 1881.

3,107. H. J. Haddan, Kensington. Heating apparatus. (Com. by J. F. Lebreton, Besançon, France.) July 16, 1881.

3,114. W. R. Lake, Southampton-buildings. Construction of roofs. (Com. by J. Schieder & C. Polzer, Vienna.) July 16, 1881.

3,115. F. Worth, Frankfort-on-the-Main. Apparatus for flushing water-closets, &c. (Com. by G. Mack, Frankfort.) July 16, 1881.

3,156. T. E. Parker, Battersea. Open fire-grates, &c. July 20, 1881.

3,170. R. R. Gibbs, Liverpool. Cooling, &c., air. July 21, 1881.

3,183. W. Cunnington & W. Cunnington, jun., Chelsea. Decoration of paper-hangings. July 21, 1881.

NOTICES TO PROCEED

have been given by the following applicants on the dates named.

July 19, 1881.

529. B. C. D. Greenhill, Puriton. Machinery for pressing with perforations bricks, tiles, &c. Feb. 8, 1881.

1,155. S. J. Payne, Charlton. Manufacture of firebricks, &c. March 16, 1881.

July 22, 1881.

1,457. R. H. Reeves, Parkhurst. Ventilating apparatus. April 2, 1881.

1,618. G. E. Wilson, Leeds. Latches and locks. April 13, 1881.

2,837. K. W. A. Leverkus, Manchester. Ventilators, &c. June 30, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending July 23, 1881.

4,768. J. Couper, jun., Glasgow. Decoration or ornamentation of glass for panels of grates, &c.

The design is produced on the inner surface of the glass. (*Pro. Pro.*) Nov. 9, 1880. Price 2d.

4,938. W. Wyman, Gloucester. Gas-stove for heating and ventilating.

Four concentric metallic shells are arranged within each other, closed at the top and bottom, so as to form two annular chambers, which communicate with each other. These chambers are heated by gas-jets beneath and the heated air is allowed to flow from the chambers into the room to be warmed. Nov. 27, 1880. Price 6d.

5,120. C. E. Gibson, Birmingham. Holding and regulating window-blind cords.

A cradle-plate is fixed to the frame, to which is attached a carrier, having two grooved rollers, which are pressed against the plate by springs. The cords are passed round these rollers, which are held in position by the springs, regulated by a screw and nut. Dec 8, 1880. Price 6d.

5,164. E. Brooke, Huddersfield, drain-pipes, &c.

Ribs or bars are formed outside the pipes, so as to keep them true when in position, and the joints are made by segments of circles of the same size as the pipes, being formed of cement and introduced into the socket. Dec. 1, 1880. Price 4d.

5,195. H. S. Snell, Southampton-buildings. Smoke-consuming grates or stoves.

This relates to that class of grate which revolves on a pivot at the back thereof. The cylindrical sides are solid metal instead of bars, and the pivot is fitted with a number of friction rollers. A spring handle is used to revolve the grate and the covers have each a locking-bar attached. Dec. 11, 1880. Price 6d.

5,212. B. Banks, Leeds. Ash-pans for fire-places.

The ash-pan is divided into two chambers by a horizontal grate which arrests the cinders, but allows the ashes to fall through to the bottom. Dec. 13, 1880. Price 6d.

5,215. W. Edes, Dover. Sewers and drains.

The upper part of the sewer or drain is perforated with small holes to allow of the escape of the gases. Dec. 13, 1880. Price 6d.

5,220. J. R. Pickard, Leeds. Fire-grates.

Chambers are formed near the grate into which the gases pass and mix with the air, whereby the carbon is entirely consumed. Dec. 13, 1880. Price 6d.

5,230. W. P. Thompson, Holborn. Hiding or filling up corners or skirtings of rooms or staircases.

A plate is cut or stamped out so as to fill the corners and prevent dust accumulating. (Com. by D. McFee, R. A. Kelloud, and D. E. McFee, Canada.) (*Pro. Pro.*) Dec. 14, 1880. Price 2d.

5,266. W. Verity & B. Verity, Euston-road. Apparatus for withdrawing or forcing air for ventilating, &c.

A cylinder surrounds the central inlet opening of the revolving fan, within which are screw blades attached to the axis of the fan, which in their revolution draw in a supply of air to the fan casing. The ends of the axis are mounted in oil vessels to diminish the friction. Dec. 15, 1880. Price 6d.

5,284. O. Seydell, Birmingham. Supplying pure air to cities, towns, &c.

The pure air is collected from the sea-shore or rural district, and pumped into pipes which are led to the town to be supplied, where there are branches off the main pipe to each house, &c. Dec. 16, 1880. Price 4d.

5,290. B. J. B. Mills, Southampton-buildings. Paving roads, &c., with wood.

The blocks are formed with a groove across their base, and are coated with plastic waterproof coating, made of gas pitch, coal tar, mineral oil, sulphur, and resin. They are mounted on a foundation of artificial fusible lava, consisting of pulverised stone, pitch, asphalte, mineral tar, resin, scoria, and lime, which are heated up to 160° centigrade and made into blocks. These being placed in position are sealed to each other by mortar or lava. (Com. by A. Trenaunay, Paris.) Dec. 17, 1880. Price 8d.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

ELY CATHEDRAL GRAMMAR SCHOOL.

OPENING OF NEW BUILDINGS.

An important educational movement has been going on for some years in the diocese of Ely, with the object of re-founding the Cathedral Grammar School as a Public School on a sufficient scale to meet the educational requirements of the diocese. On the 27th ult. some extensive new school buildings, which have been erected under a scheme issued by the Charity Commissioners, were formally opened by the Bishop of Ely in the presence of a very large and influential company. An interesting address was delivered by Dean Merivale on the occasion, tracing the history of our cathedral schools from the time of the Middle Ages, and showing the important part which they were designed to play as centres of religious education. By the reconstruction and expansion of the cathedral school at Ely provision is now made for 100 boarders, the new buildings being replete with all modern appliances. The cost of board and education is fixed at 51*l.* a year, and it is proposed to reduce this sum in favour of the poorer clergy and professional men by donations of scholarships of 25*l.* a year, the Bishop offering to maintain one for clergymen's sons.

The plans were prepared by Messrs. Carpenter and Ingelow, and the works have been carried out by Mr. S. Foster, of Kempston.

The new building, or Hereward Hall, as it is to be called, is built in the fourteenth-century style, of red Suffolk brick with Bath stone dressings, and forms, together with the new Theological College, an important addition to the architectural features of the city. It is situated opposite to the Ely Porta, built by Walpole in the fourteenth century, which is used as the large school-room, and stands on the site of the old Pilgrims' Hostelry. It comprises large, handsome, and well-arranged dormitories for 60 additional boys, with a good-sized library, preparation rooms, private studies, masters' and matrons' rooms, sick quarters, and, in fact, all the accommodation with the best modern arrangements, which are now considered suitable for our large public schools.

Some alterations are also being made in the old block of buildings, formerly the monastic dormitory. It is a building of early Norman date, raised and altered by Alan de Walsingham. He divided the stories by stone vaulting in small square bays, with columns down the centre. This crypt is used as the dining-room, and is now being lengthened by the removal of modern walls, so as to accommodate in addition the sixty boys of the new hostel.

The great dormitory above is being restored and divided into cubicles, and other improvements are being made as an instalment of more extensive works to be carried out in the future.

THE CHAPEL OF ST. ANNE'S SCHOOL, ABBOT'S BROMLEY.

St. Anne's School is erected for the education of girls of the middle and lower-middle classes. It is in connexion with the College at Lancing, and under the charge of the Provost of the Midland County Schools, with a lady resident, and mistresses under. The school, when completed, will accommodate 100 girls. Certain old buildings which were acquired have been enlarged, and a new wing built. A portion of the chapel, including the reredos, was first erected as a memorial, and it, with its ante-chapel, is now completed. It is of narrow but very lofty proportions, and is lighted by a series of two-light windows. The ante-chapel has an organ-gallery. Each story opens into the chapel by an arcade of three arches, and there is a large rose-window over the roof of the ante-chapel. On the north side is the bell-turret, finished with open arcaded work, and a shingled spire. The material is local brick, purposely made to a thickness of 2 in. The dressings are of Bath stone. The floor-tiles are the gift of Mr. Minton Campbell. The contractor is Mr. Yates, of Shifnal, the architects being Mr. R. Herbert Carpenter and Mr. B. Ingelow, and the clerk of works Mr. Tompson. The reredos, with sculptured figures of alabaster and Mansfield stone, has been executed by Mr. Hill, of Chelsea, from the architects' designs.

COOKING BY GAS.

The Welshpool Gas Company have recently held an exhibition which is certainly a new departure from the accepted traditions, and which deserves to be repeated by every gas company in existence. Taking stalls in the Welshpool market, they fitted these up as a small temporary *restaurant*, with the domestic cooking apparatus made by Mr. Fletcher, of Warrington, not, however, confining themselves to one maker exclusively, but exhibiting a fair selection. They offered at the conclusion to put up any of the apparatus free of charge for any person to whom they supplied gas. That the idea was a success may be proved by the fact that all the apparatus in use was sold at the conclusion. Their profit on the apparatus should be ample to more than pay all expenses, and they have secured a number of permanent customers for their gas, who, it is probable, would never have adopted gas cooking if they had not been invited to "taste and try before they buy." An exhibition of this kind is simple, useful, and pays everybody concerned, both sellers and buyers, and wherever it is repeated is sure to attract numbers of interested observers. It might probably pay any dealer in gas-cooking apparatus to repeat the experiment in his own town; but it is certain to pay any gas company, as they not only get the dealer's profit on the apparatus, but also—what is far more important—a number of permanent customers for their gas, who are of a peculiarly valuable class, as their gas consumption would be in the day time and most in the summer, at the times when all gas-works are partially lying idle, eating their heads off with establishment expenses and interest of capital on unemployed plant.

To people who have a chronic habit of grumbling at their gas bills, the following may be of assistance in both clearing up the cause and reducing the bills at the same time. Some months ago a family whose gas bill for lighting only amounted to over 5*l.* per day (130 cubic feet), asked Mr. Fletcher, of Warrington, to supply them with a complete gas cooking apparatus. On being asked what the probable cost of gas for cooking would be for a family of seven, he gave it as about 1½*d.* per day as a maximum. This statement was looked upon as an absurdity, and to catch him napping the meter was closely watched day by day at different hours. The consequence was that the meter dial was seen to be constantly on the move, even when no gas was used. An examination was made, and a considerable leakage was discovered and made good. When this was made right, the gas consumption, as indicated by the meter, at once dropped to 72 cubic feet per day,—less than 3*d.* for both lighting and cooking. As this reduction was brought about indirectly by the introduction of gas cooking, it may practically be said that the cooking costs 2*d.* less than nothing per day. Immediately behind the dial of a gas-meter, in the same little box, will be seen a small horizontal drum, with the figures 1 and 2 on it. This drum revolves once for every 2 cubic feet passing, and those who doubt their gas bills can easily see for themselves whether any gas is passing when all the taps are turned off. If when no gas is being used this drum revolves once in half an hour, the waste of gas at 3*s.* 6*d.* per 1,000 cubic feet will be equal to 4*d.* per day, or about 6*l.* per annum. If the drum revolved once in two hours with all taps closed the leakage would be quite sufficient to pay the expense of a thorough search for it, and show a handsome profit. Most people have an idea that if there is any leakage of gas they would be sure to smell it. This is a mistake; leakages of the worst kind occur frequently under floors which have often a free current of air passing, these leakages being often caused by nailing carpets, &c., down, and from the free ventilation underneath the leakage is not at all likely to be discovered except by the movement of the meter. As the watching of the meter is a simple matter, costing nothing, the suggestion is one which is well worthy of attention.

INTERNATIONAL ARCHITECTURAL COMPETITION AT ST. PETERSBURG.

A COMMUNICATION has been received from the Foreign Office, in a letter from Lord Tenterden addressed to the President and Council of the Royal Institute of British Architects, to the effect that British architects are invited to join in a competition for a church to be erected at St. Petersburg, on the spot where his late majesty the Czar was assassinated. The Institute of Architects publish in No. 19 of their "Proceedings" a translation of the official particulars given in the *Journal de St. Pétersbourg*, and this translation has been reprinted in the daily papers, so that it is scarcely necessary for us to repeat the particulars here. Applicants at the rooms of the Institute, 9, Conduit-street (where a plan of the site may be seen) will doubtless be able to obtain complete copies of the conditions.

COMPETITIVE DESIGNS FOR CHRISTMAS CARDS.

THE following is a list of the competitors to whom the judges have awarded prizes:—

First Prize, 150*l.*—Linnie Watt.
Two Prizes, 100*l. each.*—Caroline Paterson and Harriet M. Bennett.
Two Prizes, 75*l. each.*—E. A. Lemann and Harry Arnold.
Five Prizes, 50*l. each.*—Miss S. A. Ashworth, Alice C. Swan, Linnie Watt, Edgar Giberne, and A. M. Chambers.
Ten Prizes, 25*l. each.*—H. Sterling, Catherine A. Sparkes, Henry Anelay, Ellis Wilkinson, Archibald Thorburn, Mrs. J. W. Whymper, E. B. S. Montefiore, Frank E. Cox, Mrs. J. W. Whymper, and Brinsburst B. Lawrance.

To fifty of the other competitors the Messrs. Hildesheimer & Co., who instituted the competition, have awarded prizes of 20*l.* each. The ladies have again taken off the largest proportion of the amount offered,—1,100*l.* against 900*l.* to men.

NEW PAROCHIAL SCHOOL BUILDINGS AT LEYTONSTONE.

THE St. Matthew's Bethnal-green Board of Guardians are erecting new parochial schools in connexion with the parish of Leytonstone, and last week the memorial-stone of the first portion of the schools was laid by Mr. Collins, chairman of the Board. The accommodation to be provided in the first instance consists of a school-house for 500 children, and of six semi-detached houses, constructed on the group or cottage-home principle, each to accommodate 48 boys. The cottages for the girls and infants will be built afterwards. The architects of the schools are Messrs. A. & C. Harston, and the builders are Messrs. Jackson & Todd, of Hackney, the amount of whose contract is 11,570*l.* Mr. Geo. Poole is clerk of the works.

SALES OF BUILDING LAND AT THE AUCTION MART.

THERE were several important sales of suburban mansions and building estates at the Auction Mart last week. Messrs. Baker & Sons submitted to competition a freehold property at Willesden, called the Roundwood Park Estate, comprising two private residences, and 92 acres of land, which the auctioneer stated was most eligibly situated for building upon, being in one of the best parts of Willesden, and within a convenient distance of more than one railway station. After a close competition it was sold for 33,590*l.* Subsequently Messrs. Baker offered for sale Priory House, Southgate, with two acres of freehold land attached, which were sold for 3,160*l.*

Messrs. Brown, Roberts, & Co., likewise submitted for sale several freehold properties in Penge and Sydenham, the most important of which was 31 acres of building land in Penge, which after an animated competition was sold for 44,355*l.*, being at the rate of upwards of 1,400*l.* an acre. The same auctioneers likewise sold freehold ground-rents in Sydenham, amounting to 237*l.* per annum, for 7,115*l.*

Messrs. Glaisher & Sons also offered for sale the St. Helena-gardens Tavern, at Rotherhithe, containing four acres of freehold land. The property, which was described as of great value as a site for the erection of either business premises or private houses, was sold for 11,750*l.*

COST OF MODERN BUILDINGS.

IT is interesting to compare the cost of some of the most recent buildings of the present day. The new Grand Opera at Paris cost 40,000,000 francs; the new Hôtel de Ville, 40,000,000 francs; the new Paris Post Office, 30,000,000 francs; extension of the Conservatoire of Music, 8,000,000 francs; the new Museum of Victoria, Australia, 100,000*l.*; the Maison du Roi, in the Brussels Market-place, 2,000,000 francs; the new Provincial Government Buildings at Bruges, 2,000,000 francs; the Brussels Cavalry Barracks, 4,000,000 francs; the new Brussels Mint, 4,000,000 francs; the Palais des Beaux-Arts at Brussels, 3,000,000 francs; the new Museum at Antwerp, 2,000,000 francs; the Palais de Justice at Brussels, 40,000,000 francs; and the Department of Justice Building at the Hague, 1,700,000 francs. We may compare with the above the cost of the following buildings in the United Kingdom:—The Houses of Parliament at Westminster cost 3,500,000*l.*, or 87,500,000 francs; the new Foreign Office, Whitehall, 550,000*l.*; the Record Office, 120,000*l.*; and the Law Courts are estimated, exclusive of special fittings, at nearly 900,000*l.*

FIRE IN THEATRES.

A COMMISSION was recently appointed by the city of Vienna to report on the state of the theatres, with special reference to the possible occurrence of a similar disaster to that of Nice. In commenting on the recommendations of the commission, one of the leading authorities on the subject, Herr Orth, has called attention to the necessity of limiting the use of wood to parts of the building where it is absolutely necessary, and of employing iron and stone where it is possible to do so. He further suggests that such woodwork as is indispensable should be made as safe as possible by one of the known anti-inflammable processes. The suggestion is also made to have fireproof rooms near the stage for the temporary security of the staff of the theatre in case of fire.

ARCHITECTS' ACTIONS.

LINDLEY *v.* KNIGHT.

WM. JOHN LINDLEY, surveyor and architect, of Colne, sued Calvin Knight, manufacturer, of Colne, for 10*l.* 16*s.* 8*d.*, balance of an account of 15*l.* 16*s.* 8*d.* cost of plans.

Mr. J. Sutcliffe, Burnley, appeared for the plaintiff, and Mr. T. Nowell, Burnley, for the defendant.

The plaintiff was called, and he stated that on the 12th of November, 188?, he received instructions from the defendant as to plans for a house to be erected near houses which his brother, Mr. A. Knight, the defendant, was building. The defendant called upon witness on the 18th of November, and altered the plan. Other interviews between the defendant and plaintiff took place, and the plans were several times again altered, and ultimately the various works were advertised as to be let, but the building was not gone on with. The defendant had paid 5*l.* on account.

Cross-examined, the plaintiff said that the plans had not been touched since the 16th of December. The plans were advertised to be seen on the 13th of December, and the tenders (were to be received by the 22nd. The plans were stopped on the 17th of December. Since then Mr. Knight had erected a house somewhat similar to that projected one for which witness prepared plans.

Thomas Watson, architect, of Burnley, said that he had seen the plans prepared by the plaintiff. As the house was now, he valued it at about 1,400*l.* at least, and he thought 1½ per cent. would be a very fair charge; this would amount to 17*l.* 10*s.*

William S. Varley, architect, of Blackburn, also spoke in support of the charge made by the plaintiff.

For the defence, Mr. Nowell complained that the plaintiff failed to have the plans ready according to arrangement, and even when the works were advertised he kept the contractors waiting, and upon this account Mr. Knight had been compelled to engage another architect.

The defendant, Calvin Knight, was called, and he said that he gave the plaintiff particulars of the house he wanted building, just as the plaintiff had already said. He laid particular stress upon the condition of regularity, for if this was not complied with he told the plaintiff they would get across. Three or four times after the 13th of December witness called upon the plaintiff, once about the 22nd, the day upon which the tenders should have been received. The plans, however, were not ready. He stopped the work on the Friday after the day fixed for receiving the tenders.

Smith Whitehead, surveyor, after examining the sketches produced in court, thought they were the work of two or three days.

His Honour, in giving a verdict for the plaintiff, said he had in his opinion gone about his work in a very business-like and professional way. The fact that the plaintiff had also on hand work for defendant's brother, who was equally urgent with himself, he took to be a reasonable excuse for the delay which had occurred in the preparation of the defendant's plans. The plaintiff had from beginning to end given his evidence in a very straightforward manner, and his diary and call-book confirmed his consistency. As for the evidence given by Mr. Knight as to seeing the plaintiff on the Friday after the 22nd of December, he thought Mr. Knight must be labouring under a delusion, for the day must have been, as the plaintiff had said, and as his diary also said, the 17th. Mr. Knight had clearly been mistaken in the day.

LANDLORD AND TENANT.

AN important case as bearing on the rights of landlord and tenant, was heard last week at the Clerkenwell County Court, before Mr. Gordon Whitbread, the judge. The plaintiff was Mr. Doyle, a tenant of Mr. Wood, the defendant, and the action was brought to recover 9*l.* 10*s.*, being damage sustained by the plaintiff occasioned by the defendant's neglect, as landlord of the house, to repair certain defects in the roof. It having been proved in evidence on the part of the plaintiff that the defect in the roof of the house had caused injuries to the plaintiff's furniture, and that the landlord, although requested to do so, had failed to make the necessary repairs, it was submitted for the defendant that at the time the plaintiff took the house there was no specific contract entered into by the landlord to keep the roof in repair, and that, therefore, he was not liable for the damage which the plaintiff had sustained by the defects in the roof. It was admitted by the plaintiff that there was no such specific contract, but it was contended on his behalf that it was, nevertheless, the duty of the landlord to keep the fabric of his property in repair, and that he was responsible for the damage which had been caused by failing to repair after notice to do so.

Mr. Whitbread, in giving judgment, said that according to the law, as laid down in "Woodfall's Landlord and Tenant," the landlord, in the absence of any express covenant, was not liable to do any repairs whatever to the house. The plaintiff must, therefore, be nonsuited, with the costs of the defendant.

FIRE!

SIR,—I beg to submit a plan of mine to prevent or retard conflagrations. Flooring-planks can be made non-inflammable by pasting the boards before nailing them down; or two thin boards, paste to paste, to permanently enclose the paste. In the event of a fire, planks, laths, &c., so prepared, will not aid in destruction, and prevent extending.

I use no acids, which destroy wood; no impediment to carpenters' and painters' work; no smell or discoloration, nor extra expense. For stairs, ship-fittings, and timber in mines, it may be invaluable. I propose to supply the planks ready, or the paste, for the workmen to brush it on themselves.

R. T.

FIRE PREVENTION IN THEATRES.

SIR,—I am aware that there are several public buildings, notably theatres, which are amply provided with fire-extinguishing appliances, but is there one of the particular class to which my heading points fitted with proper indicators? I would suggest that such buildings having tanks only should be fitted with an electric bell-alarm (the same to be in the manager's room), and when the water gets at "half-full," which should be plainly written on the indicator, the bell should sound, or in the event of the fire-hydrants being connected to the street mains a similar contrivance should exist. Water in such buildings is frequently drawn off from the tanks for "water scenes" and other purposes; hence the imperativeness of the arrangement suggested herein. Besides this, managers frequently are changed.

J. C. MERRYWEATHER.

The Guardians of the Parish of Chelsea, with the assistance of the powers of the Land Clauses Act, conferred on them by the Metropolitan Poor Act, 1867, with which the former Act is incorporated, have, after publishing the statutory advertisements and giving the necessary notices, arranged for the purchase by agreement of the block of property adjoining and bounded on the west side by Chelsea Workhouse, on the east side by Robert-street, and on the north and south sides by Britten-street and King's-road respectively. The property includes thirty-six houses, a cab-yard and stables, and the infirmary-stables of the London General Omnibus Company. The freeholders were the trustees of the Duchess of Somerset's Westminster Charity. The property is taken for the enlargement of the Workhouse. Messrs. A. & C. Harston, of Leadenhall-street, conducted the negotiations on behalf of the Guardians; Messrs. Debenham, Tewson, Farmer, & Co., Mr. G. A. Wilkinson, and Messrs. Fuller, being the surveyors between whom the claims of the vendors were distributed. Plans for the Workhouse extension are now being prepared by the architects, Messrs. A. & C. Harston.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

Sir,—It may be of interest to those of your readers who intend to send in competitive designs for the new municipal buildings for this city to know that the committee on new municipal buildings,—acting under full powers from the Town Council,—on the 11th ult. appointed Mr. Charles Barry, architect in London, and Mr. John Carrick, City Architect, Glasgow, (1) to select from the designs in the preliminary competition those the authors of which shall be invited to compete in the second and final competition; (2) to advise the Magistrates and Council in the selection of the four best designs submitted in the final competition; and (3) to advise on the probable sufficiency of the estimates submitted by competitors, all in terms of the fourth paragraph of the conditions of preliminary competition.

J. D. Marwick.

THE ENGLISH LAND SYSTEM.

Sir,—All the highest authorities agree in that the system of land tenure in which the farmer is proprietor of the soil he tills is the most perfect and successful, and this has been proved by the comparisons instituted between the present condition of agriculture in several countries with the peasant-proprietor system of land tenure, and the position of agriculture in those countries under the feudal system. The instances quoted by your correspondent in his interesting letter of the 16th ult. [p. 93, *ante*] are worthless as evidence against the peasant-proprietor system. Probably the yeomen mentioned entered on a farming speculation with inadequate capital and following, and insufficient mechanical appliances; or perhaps the soil was intrinsically bad and unfit for cultivation, except with an excessive outlay. There are other circumstances which may have occurred which would produce failure. Of course, any system of land tenure, *per se*, will not remedy the deficiencies enumerated, such as, for instance, to render a barren soil prolific; although in the case of that great and worthy example of farming, Mr. Mechi's Tiptree farm, we see what science can do in the way of improving a comparatively poor soil.

My suggestions for the recuperation of England's agricultural resources are as follow:—

1. Such an alteration of the land laws as would make it possible for any farmer to become possessed of the land he cultivates in a certain number of years, and make it as easy and inexpensive to transfer land as any other description of property.

2. The appointment of a Minister of Agriculture, who should be required to issue statistics and other information of interest to the agriculturist.

3. The establishment of Chairs of Agricultural Science at our universities and colleges.

4. The diffusion of the knowledge of agricultural chemistry amongst farmers.

5. An agricultural Ordnance map of England, based on the principle of the 1-in. geological Ordnance map, showing the relative excellences of various geographical positions for the production of various descriptions of agricultural produce, &c.

6. A further development of the present excellent system of diffusing barometrical predictions, so that every farmer may be able to safely predict the state of the weather,—a knowledge of incalculable value in harvest time.

7. A general re-arrangement of railway tariffs for the carriage of agricultural produce. Tariffs at present are both irregular and exorbitant, and place English farmers at a great disadvantage in competing with foreigners.

8. The utmost possible adoption of mechanical labour-saving appliances.

If these foregoing suggestions were carried out, and I think they are within the domain of practicability, the immediate future position of English agriculture would become permanently safe and prosperous; and English yeomen would have little need to fear that the price of produce from Manitoba and the Far West would preclude them from farming with a fair average profit.

It is important and necessary that the English agricultural societies should have some programme of reform. The suggestions embodied in this letter may prove useful in the course of formulating such a programme.

B. H. Thwaite, A.M.I.C.E.

DISSENTING CHURCH-BUILDING NEWS.

Chesterfield.—A new Primitive Methodist church is to be erected here. The design is Early Gothic. The architect is Mr. Councillor Jno. Wills, of Derby; the contractor is Mr. Joseph Munks, of Hucknall. The cost will be about 2,200*l.*

Long Eaton.—A new Wesleyan chapel is to be built at Long Eaton. Mr. Jno. Wills, of Derby, is the architect. The design is in the Italian style, and the work is to cost nearly 2,000*l.*

VARIORUM.

The May number (1881) of the "Transactions of the American Society of Engineers" (vol. x.) is wholly devoted to the consideration of Wind Pressure upon bridges. It includes a paper on the subject by Mr. C. Shaler Smith, member, and a full report of the discussion which followed.——"The Mechanical Engineer's Office-Book: Boiler Construction," by Nelson Foley (Crosby Lockwood & Co), is designed to facilitate work in offices and to give an accurate method of arriving at results without repeating the same calculations over and over again. It is full of diagrams.——The current number of The *Nineteenth Century* includes a paper on "The Arab Monuments of Egypt," in which the writer, Mr. Frank Dillon, seeks to awaken an interest in their preservation. "The mosques of Cairo," he rightly says, "and the examples of domestic architecture which yet remain, are evidences of the high position attained to by their designers, and justify the dismay with which their neglected condition fills the mind of all who are capable of appreciating their beauty. It is a sad commentary upon the boasted civilisation of a century now drawing to a close that no hand has yet been lifted to avert the doom of some of the choicest monuments existing in the world." We cordially agree with him in hoping that this question may be taken up by competent hands, and not allowed to languish for want of active support from those able as well as willing to further so desirable an end. Cairo of late years has been desecrated and disfigured, and ruin is impending over many of the Arab monuments that still remain.——The *Antiquary* (Elliot Stock), has reached its third volume, and this is now before us. It is well printed, on the fashionable paper of the day, with uncut edges, and is full of matter interesting to those who are devoted to the study of the past, with an occasional touch for those who care most for things present, as when Mr. Parker launches out against the conceit of modern English architects and the "bumptiousness" of English engineers (pp. 152, 153). It is now edited, we believe, by Mr. H. B. Wheatley, F.S.A., and is carried on with much spirit.—— The *St. James's Magazine* appears to have entered upon a fresh lease of life. The August number contains pleasant reading.——In the August number of the *Art-Journal* Mr. G. T. Robinson continues his interesting series of papers on "Our Household Furniture: its past History and its present Development." In this he treats of seats, including amongst his illustrations sketches of three in Mr. Godwin's collection of chairs, viz., Anne Boleyn's, Shakspeare's, and Theodore Hook's. Amongst other illustrations in the number is a coloured plate of Satsuma Faïence.——"Birchington-on-Sea and its Bungalows," by Athol Mayhew, with "An Historical Sketch of Thanet," by S. W. Kershaw, M.A., although a very little book, contains a large amount of information on the locality of which it treats. It contains a full account, with illustrations, of the Birchington Bungalows, as built under the direction of Mr. John Taylor, and which were long ago described in the *Builder*. Mr. Kershaw adds some pleasant reading on the Island of Thanet generally. Birchington's important and close neighbour, Westgate, is made conspicuous by the all but entire absence of any mention of it in the neat little book, which looks a little like jealousy.——Part III. of "English Etchings" (185, Fleet-street), includes a subject called "On Strike," by Percy Thomas. It is cleverly executed and an interesting picture, but would scarcely tell its story without the placard on the wall.

The Christchurch Rural Sanitary Authority have requested Mr. J. H. Moore, C.E., Bournemouth, to submit to them a scheme and report on the best mode of draining Westbourne, a new populous district near Bournemouth.

Miscellanea.

Technological Handbooks.—Messrs. Geo. Bell & Sons are preparing for publication a series of Technological Handbooks for the use of candidates in the technological examinations which, instituted by the Society of Arts in 1873, were in 1879 transferred to the City Technical Institute. The rapid increase in the number of candidates since the examination scheme was remodelled, and since the examinations have been supported by the friends of the associated Guilds, is considered to justify the expectation that these handbooks will be successful, since it shows that there are many artisans and others who are seeking to make themselves familiar with the theory of their special industries. It is intended by the publishers eventually to include in the series all the industries specified in the programme of the City Institute; but at first those branches of manufacture have been selected for treatment in which it appears that text-books are most required. In accordance with this idea, six books are now announced for publication:—"Calico Bleaching, Dyeing, and Printing," by William Crookes, F.R.S., V.P.C.S.; "Iron and Steel Manufacture," by A. K. Huntington, F.C.S., F.I.C., Professor of Metallurgy at King's College, London; "Telegraphs and Telephones," by W. H. Preece, F.R.S., Memb. Inst. C.E., Electrician to the General Post Office; "Cotton Manufacture." Part I., Spinning; Part II., Weaving; by R. Marsden, Editor of the *Textile Manufacturer*; "Glass Manufacture." Crown, Sheet, and Plate Glass. By Henry Chance, M.A. (Chance Bros., Birmingham); Flint Glass, by H. Powell, B.A. (Whitefriars Glass Works); Optical and Lighthouse Glass, by John Hopkinson, M.A., LL.D., F.R.S. The series is issued under the general editorship of Mr. H. Trueman Wood, the Secretary of the Society of Arts.

The City Companies.—At the invitation of the Courts of Assistants of the Carpenters' and Drapers' Companies, a large party of artisans connected with the building trades on Saturday visited the halls of these Companies to inspect their architectural and structural features. At Carpenters' Hall, which has just been rebuilt, they were conducted over the building by Messrs. Alfred and Stanton Preston, the warden and Clerk, and shown the Court-room, which contains panelling removed from the old hall, which was built in 1629, and escaped the great fire. This room also contains a noble chimney-piece, carved by Grinling Gibbons, and in an adjoining apartment are preserved some ancient wall-paintings, which were discovered a few years since, and have been carefully restored. In the banqueting-hall a ceiling, reproduced from one designed by Inigo Jones, was pointed out. The party then repaired to Drapers' Hall, where they were met by Mr. Barrow (one of the Court of Assistants), the surveyor (Mr. Reilly), and the clerk (Mr. Sawyer), by whom they were shown over the premises, rebuilt about ten years ago on the site of a mansion belonging to the Earl of Essex, attainted under Henry VIII. The works having been technically explained to the visitors, they separated, first expressing their thanks to the Companies for the kindness and instruction they had received.

Billingsgate.—A scheme for the improvement of Billingsgate Market has been suggested by Mr. W. E. Heath, and has been published by Mr. S. Clark, Paternoster-row. It involves a viaduct from Eastcheap to the market, the upper part of which it is proposed to remove, and to form upon the internal columns a flooring or roadway over the entire area, pierced with staircases and wells for hydraulic lifts, which would take ordinary packages, and others for loaded vans and carts; a bridge or viaduct would be thrown over Lower Thames-street, at the western end of the market. Plans accompany the scheme, and we are bound to add that they do not lead us to suppose that the scheme ought to be carried out.

Ilford.—A new burial-ground, for the Great Ilford Burial Board, was consecrated on the 21st ult., by the Lord Bishop of St. Alban's. The ground is about four acres in extent, and is in the rear of St. Mary's Church, on the Romford-road. It has been enclosed, laid out, and drained, and a chapel built thereon, from the designs and under the superintendence of Mr. C. J. Dawson, architect, Barking. The contractors were Mr. Impey, of Leytonstone, for laying out and draining the ground, and Mr. C. Mills, of Ilford, for enclosing the same, and building a chapel.

Fine Art and Industrial Exhibition at Cardiff.—An exhibition of paintings, sculpture, engravings, drawings, porcelain, machinery, &c., was opened at the Drill-hall, Cardiff, on the 29th ult., by the Mayor (Mr. Rees Jones), who delivered a short address, referring to the object in view in holding the exhibition, which was to provide means for furnishing the new free library building now in course of erection, and expressing a strong hope that the object sought for would be realised. The exhibition as a whole is reported to be an extremely good one. The number of paintings, both ancient and modern, is very large, covering all the walls of the spacious building, and there are many still to be hung. Among the exhibitors of modern paintings are MacCallum, Vicat Cole, Dumonier, Edwin Hayes, Claude Calthorpe, Holyoake, T. K. Pelham, Benjamin Leader, John Mogford, J. Buxton, Knight, Rook, Carl Haache, Otto Weaver, Mrs. Murray, J. G. Philp, E. K. Johnson, E. J. Soper, A. P. Newton, and many others; and among the works of the ancient masters are paintings ascribed to Holbein, Rembrandt, Hobbema, Gerard Douw, Guido Reni, Pannini, and many others. The South Kensington Museum sends a series of water-colour drawings illustrating the progress of art from the early part of the eighteenth century until the present time. The Right Hon. W. E. Gladstone sends a large case of works in Achin ivory; Sir E. J. Reed, M.P., sends a large number of curiosities, in addition to several valuable paintings; the Marquis of Bute contributes several paintings by Hobbema, Holbein, Rembrandt, and others. There is also an extensive display of china, porcelain, woodcarvings, and furniture.

The City Day Census.—At the meeting of the Local Government and Taxation Committee of the Corporation, Mr. W. Lawley, the chairman, and Mr. B. Scott, Chamberlain of London, presented their preliminary report of the City Day Census, taken three weeks after the imperial census of this year. We are informed that the figures may be slightly altered after final examination and check. Total residents, occupiers, and persons employed, 1881:—Males, 25,287; females, 44,095; children, 21,288,—total, 260,670. The imperial census gives for the resident night population alone on Sunday night, April 4, 1881:—Males, 25,085; females, 25,441,—total, 50,526. The mercantile and commercial population in 1881 is 210,144; in 1866 it was 170,133, being an increase of 40,011. The decrease in the night residents and caretakers since the Imperial census of 1871 is 24,371; the persons resorting to the City on foot and in vehicles is greatly increased; in 1881, in a day of 12 hours (5 a.m. to 5 p.m.), 589,468; in 1866, in a day of 12 hours (6 a.m. to 6 p.m.), 479,613,—an increase of persons, 39,855; in 1871, in a day of 16 hours (5 a.m. to 9 p.m.), 1,009,640; in 1866, in a day of 16 hours (5 a.m. to 9 p.m.), 679,744,—an increase of persons, 329,896. The rateable value of the City keeps pace with the increase of population. In 1868, when the last day census was taken, it was 3,009,935*l.*; it is now(1881)3,537,561*l.*,—increase, 527,626*l.*

The International Medical and Sanitary Exhibition.—The preparation of a design for a diploma to be awarded by the Parkes Museum in connexion with the Hygienic Exhibition now open at South Kensington, was entrusted to Mr. W. Cave Thomas. The design, which are told, includes a female figure, representing Sanitary Science, standing at the prow of a boat in the act of casting her "life buoy" (hygiene) into the seething ocean of human ills. On Monday next, Mr. Eric Erichsen and the Exhibition Committee will be present at the Exhibition during the afternoon to receive the members of the International Medical Congress. The Exhibition will finally close on the 13th of August.

Chart of the Workmen, to the number of twenty-five, of Messrs. Thos. C. Halliday & Sons, Leaders, of Greetham, Oakham, and Stamford, had an outing at Belmisthorpe on Saturday last, a band of music and good cheer helping in the day's recreation. Good feeling and good wishes were manifested both by employers and employed.

Builders' Machinery at the Melbourne Exhibition.—Messrs. F. W. Reynolds & Co., Ironwark, have been awarded gold and silver medals in addition to several honourable mentions for special and patent builders' machinery and appliances.

Improvements near the Houses of Parliament. — In the House of Lords on the 29th ult., Lord Lamington asked whether, before coming to any determination as to the contemplated improvements near St. Margaret's, Westminster, her Majesty's Government would consider how far it was desirable to carry out the recommendations of the Committee on Public Buildings of 1878. In the opinion of that committee, it would be economical to borrow 1,500,000*l.* However, he would leave that part of the report alone, and would only ask whether her Majesty's Government intended to take down the houses at the end of Parliament-street. The approach to the Houses of Parliament was now a disgrace to the country. Moreover, to leave it in its present state would lead to increased expenditure, as the Government would eventually have to pay more for the leases of the houses. The improvement of a great metropolis was a question worthy of the consideration of statesmen. The Earl of Kimberley, in reply, said that the subject was really under the consideration of the Government, which would, in a very short time, owing to the pressure from the War Office and the Admiralty for further accommodation, have to decide what scheme should be adopted for the extension of those offices, and that, of course, would involve acting on the recommendations of the committee of 1878.

The London Water Supply.—In the House of Lords, on the 29th ult., the Bishop of London presented a petition from the National Health Society, and asked whether any measures had been taken or were in preparation by the Government for improving the water supply of the metropolis. From his experience as a London clergyman, he believed that an insufficient supply of water, such as existed in many parts of London, was injurious to the cleanliness, and consequently to the temperance, the morals, and, in the last resort, the religion of the population. The working-classes living in the west of London were particularly ill-supplied. All the circumstances pointed to the necessity of avoiding further delay. It was admitted that the valuable property of the water companies must be bought at a fair price. To ascertain what price should be given, recourse might be had to arbitration. This initial step, he might add, could be taken without the intervention of an Act of Parliament. The Earl of Dalhousie said the Government fully recognised the enormous importance of this question, and it hoped and expected to deal with the matter next year.

Weston-super-Mare.—The new buildings erected for "The Masonic Hall Company," Limited, at Weston-super-Mare, are now almost completed, and will be opened next month. The works have been executed by Messrs. S. T. Harvey & Co. from the designs and under the superintendence of Messrs. Price & Wooler, architects. The new Church Institute, erected in the "Boulevard," Weston-super-Mare, was opened on Wednesday in last week. The contract was carried out by Mr. Robert Shorney, from plans prepared by the same architects.

The Chichester and Midhurst Railway. In connexion with our notice of this line we are asked to add that Messrs. W. S. W. Astbury & Co., of Manchester, Hull, & London, supplied all the oxide of iron paints, varnishes, &c., used for decorating the stations and bridges of the line.

TENDERS

For girls' school, for the East Grinstead School Board. Mr. S. W. Haughton, architect. Quantities by the architect:—

Jones & Co., Gloucester	£1,443 0 0
F. Martin, East Grinstead	1,340 0 0
R. Peak, Redhill	1,317 0 0
C. Claridge, Banbury	1,220 0 0
J. Waters, Forest-row	1,195 0 0
G. & F. Penn, Pembury	1,185 0 0
J. Morris, East Grinstead	1,160 0 0
H. Martin, East Grinstead	1,094 0 0
Charlwood Bros., East Grinstead	1,065 0 0
Beard, East Grinstead	1,053 0 0
J. Godley, East Grinstead (accepted)	998 0 0

For the fitting-up of public baths, for the Borough of Longton:—

T. Busby, London	£583 12 0
T. Bradford & Co., Manchester	395 10 0
H. & R. Inskip, Longton	389 0 0
Peake Bros., Stoke-on-Trent	375 0 0
Gee & Pemberton, Stoke-on-Trent	356 13 0
G. Plant, Longton (accepted)	315 0 0

For alterations and additions to the Manor House, Looking, near Weston-super-Mare, Somerset. Messrs. Price & Wooler, architects:—

S. T. Harvey & Co. (accepted)	£375 0 0

For road-making and drainage on the Stanford Estate, Preston, Brighton,—Stanford-avenue (continuation):—

Harrison	£5,693 0 0
Woodham	5,683 0 0
Oliver	4,631 10 0
Homewood	3,963 0 0

Accepted for new premises at Jarrow, for the North-Eastern Banking Company. Mr. W. Lister Newcombe, architect:—

J. Storar, Jarrow (mason's work).
Murray & Adam, Jarrow (carpenter, &c., slater, and plumber's work).

For rebuilding the Pinespple public-house, St. George's-road, Southwark. Mr. J. A. J. Woodward, architect:—

Hobern	£4,175 0 0
Simpson	3,790 0 0
Gill	3,785 0 0
Hooper	3,539 0 0
Croaker	3,344 0 0
Kirk (too late)	3,000 0 0

For additional stables for sixty horses, and new carshed, for the North London Suburban Tramways:—

Wilkes & Co. (accepted).

For villa residences, Clytha-square, Newport, Monmouthshire. Mr. E. A. Lansdowne, architect. Quantities supplied:—

Stephens & Bastow, Bristol	£2,393 0 0
J. Whittaker	2,390 0 0
Jones & Son	2,171 0 0
Martin	2,159 0 0
Blackborne	2,143 0 0
Moulton & Bromsombe	2,123 0 0
Wilkins	2,094 0 0
W. Richards	2,075 0 0
Linton	2,047 0 0
L. B. Moore	2,029 0 0
S. Swanton	2,024 0 0

For new Congregational church, Burgess-hill, Sussex. Mr. Edwin J. Hamilton, architect. Quantities supplied:—

		Less for old Iron Church.	
J. Barnes, Brighton	£2,529 0 0	... £30	0 0
H. Parsons, Brighton	2,501 0 0	... 30	0 0
Woodgar & Sons, Horsham	2,198 10 0	... 50	0 0
G. R. Dreyer, Brighton	2,171 0 0	... 27	0 0
W. Downer, Burgess-hill	2,317 0 0	... 75	0 0
J. Longley, Turner's-hill	1,955 0 0	... 40	0 0
S. Norman, Burgess-hill (accepted)	1,995 0 0	... 100	0 0

For alteration to premises, 315, Park-road, Liverpool, for Mr. James Pratt. Mr. Walter W. Thomas, architect:—

Nicholson & Ayre	£559 0 0

For the erection of a hotel, &c., in St. Domingo-road and Everton Valley, Liverpool, for Mr. James Tarbuck. Mr. Walter W. Thomas, architect:—

W. Tyson & Sons (excavating, drainage, and brickwork)	£592 10 0
W. Thornton & Sons (mason's work)	313 0 0
Nicholson & Ayre (carpenter and joiner's work)	739 0 0
J. Tanner & Son (slater and plasterer's work)	344 0 0
J. Burrows (plumber, painter, and glazier's work)	298 0 0
R. & J. Rankin (smith and iron-founder's work)	80 0 0

For the erection of a villa residence in Sefton Park, Liverpool, for Mr. E. L. Wigan. Mr. Walter W. Thomas, architect:—

G. Morton	£5,503 0 0

For additions to Shaftesbury Hotel, Mount Pleasant, Liverpool, for Mr. J. W. Lloyd. Mr. Walter W. Thomas, architect:—

Brown & Backhouse	£1,154 0 0

For new vaults, &c. in Clifton-road, Tue Brook, for the executors of the late Mr. H. Hornby. Mr. Walter W. Thomas, architect:—

J. Holden	£1,300 0 0

For works in remaking and draining roadways, for the Guildford Urban Sanitary Authority. Mr. H. Peak, surveyor:—

Bright Hill.

Martin, Wells, & Co., Aldershot (accepted)	£167 0 0

Albion Road.

W. Pimm, Guildford	£335 0 0
Martin, Wells, & Co. (accepted)	199 0 0

Cooper Road.

W. Pimm	£260 0 0
Martin, Wells, & Co. (accepted)	369 0 0

Cline Road.

W. Pimm	£260 0 0
Martin, Wells, & Co. (accepted)	165 0 0

Alexandra Place.

W. Pimm	£120 18 0
Martin, Wells, & Co. (accepted)	86 16 0

For cottage residence, New-road, Stoke-next-Guildford. Messrs. Peak, Lunn, & Peak, architects:—

W. Swayne, Guildford (accepted)	£735 0 0

For the erection of grocery stores, warehouses, shop, and house, Bournemouth, for Mr. Lewis Johnson (including value of old buildings). Mr. J. H. Moore, architect:—

Huxtable	£2180 5 9
George	2,025 0 0
Lawson	1,864 16 0
Jones & Son	1,813 0 0
Jeans (accepted)	1,627 5 0

For the erection of stables, &c., for Mr. W. H. Saunders, contractor, Bournemouth (exclusive of certain materials and plant found by owner). Mr. J. H. Moore, architect:—

Griffin	£279 10 0
Jeans	263 0 0
Hoare & Walden	250 0 0
Jones & Son	235 0 0
Stroud	230 0 0

For ten houses, Ferne Park. Messrs. Waymouth, architects:—

Churward	£7,900	0	0
Taylor & Grist	7,690	0	0
Shurmur	7,380	0	0
Morton	6,900	0	0

For bakery, Norwich Workhouse. Mr. John B. Pearce, architect:—

A. Dodman	£1,893	1	9
Benham & Son	1,638	0	0
Newton, Chambers, & Co.	1,594	3	6
J. & J. May	1,490	0	0
R. Tidman & Son	1,447	0	0
Mather & Armstrong	1,427	10	0
Rosser & Russell, No. 1	1,423	0	0
Wand, Frazer, & Co.	1,418	0	0
Rosser & Russell, No. 2	1,384	0	0
G. P. Marshall	1,250	0	0
Barford & Perkins	1,202	0	0
Barnard, Bishop, & Barnard*	1,110	0	0

* Accepted.

For alterations and additions to No. 1, Russell-square, for Mr. N. Davis. Mr. W. Seckham Witherington, architect:—

Gibbings	£1,470	0	0
Whiteley	1,446	0	0
Maple & Co.	1,428	0	0
Scrivener & Co.	1,288	0	0

For rebuilding the Albion public-house, York-road, City-road, for Mr. J. Carter. Mr. Ernest Shum, architect. Quantities by Mr. J. G. Raynes:—

Shurmur	£1,332	0	0
Lister	1,200	0	0
Axford	1,133	0	0
Langmead & Way (accepted)	1,098	0	0

For building stabling and coach-house for Mr. D. Paull, Cavendish-road, Clapham Park. Mr. A. Cawston, architect:—

Garrod	£445	0	0
Potter on	410	0	0
Buchan	335	0	0

For completing four houses in Bedford-hill-road, Balham, for Messrs. Andrew & Chesle, of Tunbridge Wells:—

Potterton (accepted)	£700	0	0

For repairs and alterations to No. 105, Tottenham-court-road, for Mr. James Chambers. Mr. Walter Hall, architect:—

King	£255	10	0
Adams	243	0	0
Martin	230	0	0

For the erection of boundary walls for Mr. Tudor Crawshay, on his Turnham-green Estate. Mr. Walter Hall, architect:—

King	£373	0	0
Westcombe	348	0	0
Adams	317	0	0
Adamson	305	0	0
Ayers	300	0	0

For repairs, &c., to six houses in Sandall-road, Camden road. Mr. Walter Hall, architect:—

Medley	£200	0	0
Jones	180	0	0
Jerrold	176	0	0

For repairs and alterations to No. 127, High-street, Camden-town, for Mr. Sizer. Mr. Walter Hall, architect:—

Keene	£147	0	0
Gould & Brand	147	0	0
Robson	138	0	0

For the erection of a mortuary and contagious diseases wards at St. Matthew's, Bethnal-green, for the Board of Guardians. Messrs. S. & W. Stone, architects:—

Edwards	£1,023	0	0
Beale	1,015	0	0
Steele Bros.	999	0	0
Thomason	990	0	0
Wire	929	0	0
Boyce	927	0	0
Young	910	0	0
Shurmur	891	0	0
Jackson & Todd	890	0	0
Cox	878	0	0
Hunt	845	0	0
Johnson	842	0	0
Judd	795	0	0
Garrett	777	0	0
B. T. Wood (accepted)	777	0	0

Accepted for the erection of a new 40-quarter brewery at Derby, for Messrs. Stretton Bros. Messrs. Scamell & Colver, architects and engineers. Quantities by Messrs. R. L. Curtis & Sons:—

No. 1.—*Building.*

H. Lovatt, Wolverhampton	£5,815	0	0

No. 2.—*Girders and Columns.*

Thornewill & Warham, Burton and Derby	1,325	0	0

No. 3.—*Boilers.*

Thos. Piggott & Co., Birmingham	780	0	0

No. 4.—*Millwrights.*

Thornewill & Warham, Burton and Derby	2,297	0	0

No. 5.—*Coppers and Underback.*

Bindley & Briggs, Burton-on-Trent	735	0	0

No. 6.—*Backmakers' Work.*

Wilson & Co., Frome	359	0	0

No. 7.—*Slate Backs.*

Ashton & Green, London	102	0	0

No. 8.—*Pipe Connexions, &c.*

Bindley & Briggs, Burton-on-Trent	900	0	0

No. 9.—*Refrigerator.*

Lawrence & Co., London	186	5	6

For pulling down old buildings and the erection of three new houses and shops, at the Broadway, Pritchard's-road, Hackney, for Mr. John Elves. Mr. Edward Brown, architect:—

Marr	£2,673	0	0
Nixon	2,647	0	0
F. & F. J. Wood	2,597	0	0
J. Uff	2,465	0	0
J. K. Johnson	2,353	0	0
Shurmur	2,277	0	0
Salt	2,256	0	0
Hawkins	2,100	0	0

North London Suburban Tramways.—The tender of Messrs. Wilkes & Co., for the extensions from Edmonton to Ponder's-end, has been accepted, and the works will at once be commenced.

Shoreham Workhouse.—The list given in our last should have included Claridge, 9,585*l.* For "Cook & Co." read Crook, 9,197*l.*

TO CORRESPONDENTS.

W. K. B.—E. G.—W. S.—J. H. M.—E. S. R.—T. C. H.—F. T.—F. H. S.—W. F. P.—J. W. H.—J. G. R.—W. J. L.—A. B. B.—M. R. & Co.—T. P.—J. B.—H. J. S.—A. W.—M. & Co.—O. R. & Sons.—W. & Co.—L. & Co.—C. D. P.—W. R. S.—S. & C.—H. H. C.—P. L. & P. W. S. A. & Co.—R. W.—E. J. H.—W. R.—H. & W.—A. W. P.—A. L. R.—E. S. H.—A. B.—J. W. S.—W. M. & Co.—J. W.—T. D. B. & Son.—J. W. H.—H. & Co.—A. B.—S. T. H.—S. W. H.—J. A. P.—E. & L.—G. V.—W. & C'o (should in future send names and amounts).—D. M. (ditto).—A. B. (there should be a comma and dash after the word "portraits," instead of full-stop).

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The Builder.

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A Central Railway Station for London.

INSTITUTIONS, to thrive in England, must grow like indigenous plants. They rarely thrive if forced, or if brought ready raised from the hotbed of political theory. It is the oak or the elm, dotted irregularly over park or hedge-row, that is the characteristic timber of England, not the regular lines of carefully-planted larch or spruce. Thus it is that our railways have grown. Originally regarded with that distrust which was, fifty years ago, usually extended, in England, to any great novelty, they were arrested, perforce, in the suburbs of our great towns and cities. No one, it is safe to say, could at all realise in 1834 or 1835 how the new mode of conveyance would associate itself with the national life of the country. Thus for the London and Birmingham Railway, the first constructed south of the Trent, the directors were glad to avoid a great amount of opposition by stopping at Camden Town, then a rural suburb of London. The Great Western Railway, in the same way, stopped at Paddington; the Eastern Counties at Shoreditch. The Brighton was bolder than its neighbours, and in its close approach to London Bridge tapped the sources of its passenger traffic nearer to the centres of population than did any of the Northern lines,—a fact mainly due to the character of the district through which it was found possible to run a line.

Not that Robert Stephenson, Isambard Brunel, or any of their brethren, regarded these sneaking approaches to central *termini* as anything but makeshifts. Indeed, the London and Birmingham Railway was only just in course of construction when a Bill was obtained for an Extension to Euston-square. It was proposed that the Great Western line should form a junction with the London and Birmingham line at Wormwood Scrubbs, and that the two should have a common station at Euston. With this view land was taken, and works were contracted for, for a fourfold line from Camden Town to Euston. The accord came to nothing before the Euston Extension was completed; but the very proposal was of great service to the London and Birmingham line, as Mr. Stephenson had the courage and foresight still to construct this couple of miles of double width, notwithstanding the fact that it was no longer expected to carry a double traffic.

At the time when the Act for the Euston Extension was obtained, the country ran up as far as Drummond-street; the intervening distance to Camden-town running through market gardens, or cow-farms, and other neglected, but unbuilt-on suburban localities, having only the Hampstead-road and Park-street to cross, by subterranean galleries, as truly urban neighbourhoods. How the work of the builder has crystalled around the line thus run it is needless to point out. Our object in recording these memories is to show that at Euston-square, as well as at Paddington, Mr. Stephenson and Mr. Brunel merely utilised the nearest approach to the centres of population which could be found without running through streets and squares, to which the opposition then likely to be offered would have been certainly costly, and probably successful.

It thus happened that the London terminus for that grand system of communication, of which the 110 miles from London to Birmingham formed the nucleus or germ, is fixed at a spot which is one mile and three-quarters from Charing-cross, and two miles and a half from St. Paul's. We may take Charing-cross, to the West, and the Mansion House, to the East, as the two main centres of the passenger movement to and from London. It will be seen in a moment how severe a tax is imposed on every passenger by the London and North-Western Railway, in consequence of the locality of its terminus. The termini of the Great Northern and the Midland lines are not much more conveniently placed, although they were erected at so much later a period. But the Metropolitan line supplies a convenience to the customers of the two latter lines, which is not afforded to those by the North-Western.

It is now idle to speculate as to what would have been the actual condition of things had English people known as much of the advantages and disadvantages of railways in 1830 as they do in 1880. That the London and North-Western, Great Western, South-Western, South-Eastern, Brighton, and Great Eastern Railways would have had a common central station, is one of the conditions that would have probably resulted from an absence of urban opposition to the entrance of the locomotive, with its frightful noise, within densely inhabited localities. Or it might have seemed more practicable, the expense of purchase of property being regarded, to select two stations; one for the lines north, and the other for those south, of the river. In that case, our knowledge of the London of 1830 leads us to conclude that the central station for the western lines would have been probably situated somewhere between Lincoln's Inn-fields to the south and the Foundling Hospital and the County gaol to the north-west and north-east. The southern centre would have probably adjoined Blackfriars Bridge-road, either to the east or the west of that great line of thoroughfare. In the wish to avoid the great cost of a Thames bridge, these two northern and southern termini might have long remained without direct communication by rail. But when the time came for such a communication the great traffic would have allowed of an outlay that would have afforded a noble bridge and a convenient line of junction.

That, of course, is mere speculation. But the fact remains that the disjunction of the several metropolitan stations, as well as their suburban localities, imposes a heavy tax on most of the customers of these lines; and in the case of a through traffic, say for any one going from Birmingham to Southampton, or from Oxford to Colchester, forms a serious impediment.

Under the circumstances, the proposal, which has been recently brought on the *tapis*, of a central railway station for London, is one that deserves very serious attention. We are speaking without any prejudice for or against any particular project; indeed, we are disposed to hold that the frank acceptance of any such scheme by the directors of the great trunk lines must be one of the conditions necessarily precedent to any well-digested appeal to the public for support. But as to the need itself, it is so obvious that it seems to be that the main point for serious consideration is this: Would it be better, regard being had to existing accommodation, and to the enormous outlay already incurred by the various companies on their terminal stations, to attempt now the construction of such a terminal station as might be designed if the ground were virgin, and if the accommodation of the passengers were the one main object to be considered? Or will it be wiser to attempt such a systematic linking together of the actual stations as may to some extent have the same object?

Mr. C. Waring, one of the promoters of a scheme for bringing the railways terminating at Euston-square, Waterloo, and Paddington, to Charing Cross, and lodging them in a spacious station to be erected in Northumberland-avenue, gives some striking figures, taken from the Census, to illustrate the inconveniences attending the position of the Euston Station. He speaks of it as "selected by Mr. Stephenson forty years ago as a fit terminus for the then 300 miles of railway in the London of that day, comprising two millions of people." This is not quite exact, and neither does justice to Mr. Stephenson, nor makes out the best case for the central station. It was in 1834, to the best of our remembrance, that the Bill for the Euston Extension was passed, forty-seven years ago, and the selection was merely that,—and a very masterly one it was,—of the nearest spot to the centre of population to which the existence of garden ground and property not covered with buildings allowed a line to be made without wholesale destruction of house property. We have got beyond that state of things, partly

because the traffic has so increased that the companies can afford to buy their roadway through London itself, partly because the public are so anxious for economy of time, and for saving in cabs and other vehicles to take them to the railway stations, that the objections which, in 1834, were insuperable, are now regarded as trivial.

"Immunity from competition with each other," says Mr. Waring, "is secured to each of these three railways, owing to their proximity, by equal economical and geographical injustice done to the public by all of them." That being to some extent admitted, why are we asked to provide for the union of three of the lines alone, and those three as to which a certain amount of intercommunication already exists outside of London itself, instead of for the solution of the whole problem of the conveyance and exchange of the traffic of all the railways radiating from London?

We are anxious to say nothing hastily upon a very important subject; one, moreover, as to which we have reasons for taking an interest which may be called historic as well as prospective. We have already spoken of Charing Cross as one of the main centres of London, and if land is to be obtained in the vicinity, at any price which it would be prudent for a public company to pay, there might be wisdom in securing it for station purposes. The great thing to bear in mind would be to set down our feet firmly against the farther disfigurement of London by any more of those hideous and enormous roofs, as to the permanent safety of which we are not altogether at ease, and as to the destructive effect of which on the beauty of an urban neighbourhood there can be but one opinion. But what seems to us as in the first place most obvious is the need of a line of railway communication, as we have before now suggested, between Charing Cross and Euston Station. Costly as it would be, we think that such a line would pay, supposing that it was designed and arranged to answer the double purpose of a through railway line, joining the northern and southern railways radiating from London, and of a local urban railway, accommodating an enormous traffic. It is not our intention to indicate the precise course of such a line, but it will be obvious to every one familiar with London that a railway which first substituted a direct and rapid route for the circuitous and perplexed network of streets that now separates Charing Cross from the junction of Oxford-street and Tottenham Court-road, and then followed approximately the line of the latter, and of the Hampstead-road, to the neighbourhood of the Euston Station, would be about the most important stratigraphical improvement that can be suggested in London. Its local traffic, we apprehend, would vie with that of the Metropolitan Railway, and would be more evenly distributed through the day than is the case on that line. For its through traffic we have no precedent, but of its magnitude there can be no question. Further, a line of this kind, while supplying a great want, as much felt by the provinces as by the metropolis, would be safe from any fear of practical competition. The completion of the junction between the Mansion House and Aldgate would in no way interfere with the traffic of this route. To the West, nothing is likely for a long time to be projected within the loop of the Metropolitan and Metropolitan District Railways. Supposing a direct and convenient service to be established over the various lines from the Chatham and Dover Line, south of Blackfriars, to King's Cross, it would not serve the purpose of the traffic of the line we have indicated. It therefore seems to us, while perfectly willing to hear and to consider all that can be urged in behalf of any particular scheme, that the linking of Charing Cross with Euston Square by railway is the first and most feasible object now practicable, and that the question of a central station must be rather secondary than prior to that of the best articulation of the existing London termini.

And yet, notwithstanding the urgent need for such a line on the one hand, and the abundance of capital waiting for safe and lucrative employment on the other, there is one consideration which imperatively prohibits any immediate action in the case as premature. At this present time of writing, no one would be prepared to bring forward a scheme for a railway from Charing-cross to Euston, excepting underground. Independently of the great objection entertained to multiplying tunnels for passenger routes, the cost thus incurred is enormous, chiefly in consequence of the interference with the sewers and whole arrangements of underground London by such a line. The cost could not be estimated at less than from 350,000*l.* to 400,000*l.* a mile, and perhaps much more. A high-level railway, on the other hand, while much cheaper to construct, and more acceptable to the passengers, is justly regarded as inadmissible from the noise of the locomotive traffic. But if, as intimated by us in recent articles, the electric method of propulsion be established, the main objection falls to the ground. An electric high-level line,—we put the matter as yet only as a possibility,—might afford a mode of articulating the London termini, with which no other could compete. And therefore, before subscribing to any new London extension of the railway system, we advise our friends and readers to wait for the thorough establishment, or the reverse, of the claims of the electric railway. We think it far from impossible that a judicious application of this invention to the existing railway features of London may lead to as full and as adequate accommodation being given to the railway public as would have been the case if the central station or stations to which we have referred had been erected forty years ago.

THE "FURNITURE TRADES" EXHIBITION.

The Agricultural Hall is at present occupied by an exhibition of furniture, contributed by the furniture trade, and stated to be "the first annual one," so that we may regard this as the first experiment in a series of contemplated exhibitions of the same type. Exhibitions of what is called art-furniture are common enough now; but there is some interest in looking over a collection not especially or ostensibly got up as an art exhibition, and noticing what degree of artistic taste and workmanship is realised as the spontaneous effort of a number of firms. There is much more which can be praised in this respect than we were prepared to find. There are a good many things that would not be admitted, certainly, into an exhibition of artistic furniture, but there are also a good many which would do credit to any exhibition, as far as good taste and good workmanship are concerned. Indeed, in looking over the spirited introduction to the catalogue, written by Mr. Benn (editor of the *Cabinetmaker and Art Furnisher*) we are disposed to say with the artistic ladies in "Patience," when they come in and find the officers practising æsthetic attitudes, "The sacred fire has descended on them, and they are of the inner brethren." This, after all, would not be quite fair on Mr. Benn, as, in fact, he seems to have much more common sense than to indulge in æsthetic rhodomontade, and his remarks are much more to the point than some of the prolusions of the professed art-critics of the day on similar subjects.

Considering this as a collection of work supplied by the furnishing trade in their ordinary practice, and not specially designed to suit the taste of architects or of exacting customers, there is a good deal in it to show how much the principles and practice of pure taste in furniture design have affected the general spirit and practice of the trade in many cases. If we were to take the stand of articles exhibited by Messrs. Jackson & Graham as a typical example, this progress in taste might, indeed, be considered most remarkable; there is really nothing among the articles exhibited which the most fastidious taste could call in question,—nothing which is not in this respect almost as good as it can be as far as it goes. This firm, however, occupy rather an exceptional position, dealing with a very cultivated class of customers, and having the regular and acknowledged assistance of some well-known and practised designers among architects and decorative artists. But in the works of other firms of less eminence we notice a most gratifying excellence in the articles exhibited, not so much in the attainment of high-class artistic work, for there is not much that could be so described, as in the generally correct perception as to the treatment of objects and materials which prevails in the work of some of the exhibitors. In others, again, we are certainly conscious of some of the indigenous English lack of artistic perception in form or colour. The first stand, for example, exhibits Messrs. Trelar's mats, some of which are seen in process of manufacture. They are excellent things of their class, as every one knows; but in those in which variety of colour and some slight ornamental treatment are adopted, we cannot but be struck with the raw and disagreeable tones of the colouring, and the uninteresting character of the design; yet these are from a firm which largely deals in importing Eastern rugs and druggets. Surely their own imports ought to teach them more in regard to form and colour in work of this class. We notice the same common-place character and disagreeable tone in some of the linoleum productions, of which there are exhibits by two firms; there is occasionally a good diaper among a number of poor ones. The Saxon Wood Industrial Company, again, show a number of chairs of no very particular merit or character in design, and padded with upholstery in fearfully raw colours.

Among the best class of furniture, the tendency is to simplicity of line, and in many cases to simplicity of material. The old English rush-bottomed chair has become quite sought for now, and several firms show specimens of it in a perfectly plain form, but with excellent finish and workmanship; among the best are those by Mr. Walter Skull and Messrs. Benjamin North & Sons, the latter of West Wycombe. A good many of the exhibits, we may observe, are from country firms, and among the London firms the majority seem to be those from the City and east-central, not from the western districts. Among other furniture, that exhibited by Messrs. Lucraft & Son is of excellent quality, both in regard to workmanship and good taste; we refer chiefly to that portion of it which does not affect special imitation of Japanese work, &c.; this latter class of work, which seems to be a speciality of this firm, is well done, but we put this merely imitative work on quite a lower level than the production of simple and serviceable furniture which is not a marked mimicry of any style. Of the professed imitations of Sheraton and Chippendale, some of the best specimens are those of Mr. Julius Jansen; they have the merit not only of elegant finish in the ornamental details, but of more appearance of strength and solidity than is sometimes found in work of this style. Messrs. C. & R. Light show very good work of the same class. Ebony or ebonised cabinets are, of course, legion, and are really so like each other that none can claim any special merit over others; the general average of taste displayed in them is good, but some of the exhibitors are far too much enamoured of looking-glass effects, and cover the surfaces of their cabinets with a multiplicity of mirrors, in such a way as to destroy all repose of effect, and give a vulgar and gew-gaw appearance to what otherwise would be good furniture. Mirrors, when regarded as ornamental effect, should be very sparingly used; just one small one in the central portion of the design, perhaps, but nothing more. Other furniture that deserves high praise for good style and workmanship is that by Mr. Loder, of Cheltenham; Mr. Wright, of Chichester; and Messrs. Wallace & Co. Mr. Turpin, of Bayswater, shows some very good carved chimney pieces, with a portfolio of photographs of similar work done by the same firm, evincing a very high average of taste and neat execution. Mr. Bassant's collection of parquetry is very creditable, and some of it very good in design, but there is too much of interlacing work and apparent relief, which is out of place in work which ought to appear, as it really is, completely flat and destitute of any appearance of superimposed planes. The collection of Mr. J. A. Deintje, which is stated to be all taken from stock work, and not manufactured for exhibition, is most creditable when regarded in that light, but there is a great deal too much looking-glass put on it.

Among one or two specialities may be mentioned the combinations of Canadian bass-wood and walnut, and of cedar-wood and bass-wood, exhibited by Messrs. Thomas Fox & Co. These make costly furniture, but they are very pleasing in effect. The bass-wood, of a peculiar and almost greenish tint, is used for the principal mouldings round panels, and in other situations; the effect is very pleasing, and the workmanship excellent. The cedar and bass-wood dressing-table is a beautiful piece of furniture,—quite an *objet de luxe*,—though the ornament is very simple, and sparingly used. The manufacture of such goods in this material must, however, be restricted, from the difficulty of getting sound and complete pieces of cedar-wood of sufficient size. Among a few articles exhibited by Mr. W. H. Lascelles, a couple of concrete chimney-pieces are worth notice, in a fine concrete, allowing of a certain amount of surface-ornament.

he white one looks rather raw and coarse, but he "green concrete" is an excellent material for ottage chimney-pieces. One or two exhibitors how stands of Gothic furniture, not quite of he best type, but very fair; still one cannot elp feeling that this is heavy and unsuitable ork for furniture, in comparison with the rniture derived from Queen Anne and Georgian types. These types supply, in fact, hat is essentially a furniture style, the excellence of which, in that light, we have never uestioned; the mistake is in applying this rniture style to stone and brick architecture, or which it is quite wanting in dignity of effect nd force of detail. The "Austrian bent-wood rniture," of which there is a very large collection, is, no doubt, capital workmanship in its way, ut, artistically, most disagreeable,—nothing ut weak-looking, sinuous curves, with no points f construction or design emphasised in any ay. It would be easy to give to this class of rniture a more artistic appearance with little xtra expense, and without interfering, in any ay, with its peculiar constructive character, if hose who produce it knew how to do it, or ould get any one to show them. As it is, it may lmost be called "anti-art" furniture; no one vith a cultivated eye for style would care to rnish his room with it, though it is perfectly onest workmanship.

Among constructive specialities are one or wo ingenious combinations the usefulness of which, however, is perhaps hardly equal to their ngenuity. Messrs. Daw-Kerrell & Co., for nstance, exhibit a patent combination couch nd bed: an article which when closed appears s a couch suitable for a sitting-room or bedoom, but the top of which is hinged to turn ver, when it becomes a bed of twice the width of the couch. This might be useful when t is necessary in case of sudden illness to xtemporise a bed, but we do not imagine many people would provide themselves against hat contingency. There is a combination lining-table and billiard-table, "convertible in wo minutes," by Mr. Edwards, of the Kingsland Billiard Works, the top of the dining-table liding off and showing a billiard-table under; ut then, in consideration of the necessary estriction in width for a dining-table, the billiard-table when uncovered is of very limited ize. Messrs. Gudgeon & Sons, of Winchester, xhibit a patent sliding wooden mantelpiece, of very ingenious construction, the object of which s that, when moving from a house, the mantelpiece can be taken away, and, by sliding, raised or reduced in height and width to fit the new fireplace. Whether the closely-fitted pieces are likely to slide very readily, however, after being some years in one position and exposed to the changes of temperature incidental to their proximity to the fireplace, may bequestioned. All these contrivances seem more calculated to display the ingenuity of their inventors than to serve much practical purpose.

The stand of Messrs. Hodkinson & Clarke, of Canada Works, Birmingham, shows an unusual collection of things both useful and more or less artistic. Some of their domestic stained glass is remarkably good in appearance and artistic quality for the prices quoted. They have some specialities in sliding or wind-up window shutters and blinds, which combine practical convenience with good appearance and some susceptibility of decorative treatment, especially in the case of their "Early English Shutter," which is capable of being made very pretty by surface touching or gilding, at comparatively little expense, and in a manner naturally suggested by its construction. The "Linerusta-Walton" material for wall covering is admirably illustrated, and so is the less known "Papyrotile decoration," a kind of leather wallile, another application of which may be seen in the Sanitary Exhibition at Kensington. In both these exhibits there is much really pretty and artistic work displayed; but in both the mistake is made of producing imitations of other materials, wood panelling, &c. The large collection of brasswork, by Mr. W. Close, shows how much progress has been made in the way of tasteful treatment of this material, even in the average stock of a manufacturer. There is nothing of a very high character in design, but at least the old brass monstrosities seem happily to have entirely disappeared.

One thing we must say in praise of the Furniture Trades Exhibition, that its managers know how to arrange and catalogue an exhibition. Nothing could be better in this respect. All the stands are arranged and numbered in regular order, with large placarded numbers that can be read nearly across the room; the corresponding numbers appear in large black numerals against the description of each stand in the catalogue. Anything seen in the room can be at once found in the catalogue, and *vice versâ*; and the catalogue is arranged in double columns on each page, one column giving the descriptions, the other column left blank for "visitor's notes." We could wish all concerned in arranging exhibitions would take the same trouble to ensure convenient and intelligible arrangement.

COLLEGE AND CORPORATION PLATE.

The last addition to the collection of South Kensington Handbooks* forms a very interesting and well-illustrated little treatise on one of the most fascinating branches of silversmiths' work. The objects described are among the finest works of their class, having been in almost every instance originally gifts or bequests from personages of importance to institutions of importance, and the givers have taken care that their donations should be worthy of the donors and receivers alike. There is a certain additional interest imparted to the subject from the historic associations connected with these beautiful pieces of artistic workmanship, which have been preserved from generation to generation as among the treasures of learned colleges and ecclesiastical institutions, and produced no doubt for the admiration of honoured guests on many an occasion of pious or festive ceremonial. Nearly all the examples figured are also, either certainly or on the most probable presumption, of English workmanship, and may in that light be regarded with a certain patriotic satisfaction, coupled perhaps with a melancholy reflection that so little work at all equal to them, in design at least, is produced in England now.

The articles illustrated are mostly drinking-cups, but include also spoons, salt-cellars, or "salts" (as it seems the fashion to call them in South Kensington vocabulary), and other articles of table use, as well as church plate. The subject is treated chronologically, the earliest articles of importance dating from the fourteenth century, the most curious and characteristic of these being the wassail-horn at Queen's College, Oxford, with two bird's claws as feet for it to stand on; a very good example of the fanciful introduction of animal features in ornamental work, in a suitable and semi-natural manner. The one defect is that the feet are not well joined to the body of the horn, or rather to the silver rings which encircle it. Another Oxford College, All Souls, furnishes the earliest specimen of the peculiar wooden drinking-bowl, known as a "mazer," which word Mr. Cripps derives from the Flemish *maeser*, which signifies a knot of the maple tree, out of which this class of bowl seems to have been originally made. These bowls are, of course, silver mounted, the mounting alone (generally round the rim and upper portion) bringing them within the scope of the present subject.

It is interesting to compare the method of applying and distributing ornament in the various periods of design through which the illustrations take us. These range from the fourteenth to the eighteenth century; and it may be observed that the periods which are the greatest in some higher branches of art do not present the best art of this class; and that the style embodying some of the best and richest detail does not always present the best application of ornament to the object. The Perpendicular period, which is certainly not the greatest period of English architecture, presents us, nevertheless, with the most perfect of all models of silver cup design, that of the chalices of the period. Not even in Greek art can there be found any more perfectly logical and suitable application of ornamental design to drinking-utensils than the chalices of this well-known form, so much imitated in modern church plate, present to us. Not only is the ornament pre-eminently suited to the material, but it is all exactly where it ought to be,—the broad-spreading and heavily-moulded base, the large knob on the stem for grasping it by, the fine outline of the bowl, often perfectly plain, always plain towards the rim, where it is to be used,—all these details combine to form an object exactly suited, both practically and in design, for the object for which it was intended. The Leigh cup at Mercers' Hall (about 1500) is an example, on the other hand, of great richness without good application of ornament; the same trellis-work is carried over all the parts, without distinction as to their use or form, and the general impression is that of a very rich and handsome but rather weakly-designed piece of work. The "Century of the Renaissance" presents us with some very fine work, though some of the objects figured in connexion with the chapter so named are by no means Renaissance in feeling; indeed, the illustrations of the before-mentioned chalice forms belong to this century, though the form arose earlier. But the beaker belonging to Christ's College, Cambridge (1597), is essentially Gothic in feeling; the rising tide of the Renaissance did not fully submerge our Gothic shores till some time after it was at its height in Italy. This same beaker is another admirable specimen of the application of ornament,—the salient lines marked by mouldings and running ornament, the surfaces by a totally different and very rich surface ornament, the base spreading and heavy to give stability. The "Poison Cup" at Clare College, Cambridge (so called from the cover containing a crystal which was supposed to grow dull at the presence of poison in the liquid), shows a beautifully rich example of surface ornament, remarkable for its mingling of Gothic and Renaissance character; other parts are pure Renaissance, yet this is earlier (1570) than the Christ's College beaker. The feet are formed, very unhappily, of cherubs' heads, upon whose chins the whole rests. The ewer belonging to the Corporation of Norwich (1597) is complete Renaissance in style, with the elegance and the worst faults of detail of the style, the handle being formed of a female torso bent back, and with a hideous mask on her stomach, after the fashion so common in Italian design and (later) in the work of the "little masters" of Germany; the cup is called English, but it must have been designed by some one under exceptionally strong Italian influence. "The Century of the Stuarts" shows some very elegant and sensibly designed specimens, and also some in which the decoration is very false in taste and very badly applied. The objects which illustrate the earlier part of the eighteenth century occupy a peculiar place in the artistic grouping of the subject. They are totally without the higher order of fancy or invention, or the merit of rich and sumptuous effect; their *motifs* are tame and commonplace, and yet they recommend themselves by a great degree of correctness of taste and purity of line. The candelabrum belonging to the Haberdashers' Hall is a good example of this; it is what one might call coldly designed,—there is no evidence of artistic enthusiasm about it, but it has the great merit of being quite unpretending, convenient in shape, and admirably suited to its purpose.

This kind of comparative criticism as to the application of ornament to utensils seems one of the suggestions which the illustrations of this little book especially afford. Those who take it up for themselves, and go through the whole of the examples, may carry out further some of the reflections we have suggested.

We may add one comment in regard to Mr. Cripps's indignant reflections on the bigotry of the times (1566), when "one parish records that the pyx was defaced and given away for a child to play with. . . . . the vicar had made a swine's trough of the holy-water vat, and that the sacring-bell was used to hang about a calf's neck," &c. Those archæologists who make indignant reflections on such doings quite forget that this degradation of the vessels was a practical protest against a superstition then only just extinct. To us the articles which have thus been lost or defaced would have been of high interest as art, and we may well regret their loss. But to enthusiasts of the Reformation period it may very well have seemed that the holy-water vat was better used as a pig's trough than in assisting to keep up a foolish superstition. We have no doubt the brazen serpent was a most interesting piece of antique work, and that Hezekiah, who "brake it in pieces," because his subjects burned incense to it, would have incurred the wrath and reproaches of archæologists and archæological societies, if there had been any in Judæa in his time.

* College and Corporation Plate: a Handbook to the Reproductions of Silver Plate in the South Kensington Museum, from celebrated English Collections. By Wilfred Joseph Cripps, M.A., F.S.A. Chapman & Hall. 1881.

The Trade Unions Congress.—About 200 delegates are expected to attend the congress, which will commence on Sept. 12, in London.

THE WORKING MAN'S APPEAL FOR FAIR TRADE.

It would be manifestly unjust to a very large proportion of our readers to pass by in silence such a public appeal as has recently been made by, and to, the working man on the subject of "Fair Trade." For the first time in our remembrance we now see a subject brought forward, not by politicians or by agitators, but on the ground of the strong feeling of alarm which appears spontaneously to have arisen among the great mass of operatives. When we find the representatives of the allied trades of the West of England; of the trades associations of the West of Scotland; of the town trades and shipping trades councils of Glasgow and of Liverpool; of the trades associations of Hull and Birkenhead; of the brassworkers, the sugar operatives, the coopers and case-makers, the shipwrights, the dock-yard labourers, the watermen and lightermen of the Thames, and the British seamen, among the signataries of a public appeal made on economic grounds, it is evident that it would be worse than folly either to ignore such a symptom of the times, or to affect to treat it with disrespect.

It is not our object on the present occasion to attempt to express any judicial opinion on the subject thus imperatively brought before us. But we think that it may be of very great service to a large body of earnest men, if we ask their attention for a while, first to certain points on which there is no real difference of opinion, as matter, at all events, of theory; and, secondly, to certain considerations, tending to clear the mind from fog, which have up to this time been remarkably neglected by most writers on the subject of trade.

In the first place, it is now generally admitted as matter of principle and of theory, that a wholly unchecked freedom of trade would be the condition tending to produce the greatest amount of general prosperity among all the nations of the earth, as well as to produce a general level of prices throughout the world, and an equality in the wealth and the well-being of different states and nations. That is a point not now called in question.

The points which now come under practical debate, are,—first, "How is the establishment of such a state of things to be most wisely and efficiently promoted by Great Britain?" and, secondly, "What is the effect upon our own industries, either in mass or in detail, of the steps taken from time to time to ensure that result?" It is clear that it is now beside the mark to revert to those general statements concerning the advantages of Free Trade which, forty years ago, were in fierce dispute. There is little or no contention on these points now. The matters at present in debate are on points of detail, and of detail as to which the experience of the last ten years has mainly to be taken into account and to be explained.

It may prevent much waste of time if attention is directed to the fact that the ordinary division made by writers on political economy of a nation into "consumers" and "producers," although correct and useful enough as an analytical expression in a certain stage of the argument, is not one that recommends itself to men of business. It is not a true division,—and that not only because all producers are also consumers, so that a whole is balanced against a part, but also for a more practical reason.

If a man of business be asked where lies the secret of success and of the art of making a fortune, he will reply, or, at all events, he will agree to the reply, that the chief requisite is to be a good salesman. The art of selling is the art of growing rich. It is organised amongst us to a great extent, but the chief misfortune of the organisation is its competitive, rather than its co-operative, nature. The vast machinery of advertisement is a part of the organisation of sale; and so powerful is this machinery that the cases are few indeed in which an inferior or even a bad article, extensively advertised, does not drive a good but unadvertised article out of the market. The proverb that "Good wine needs no bush" is now unfortunately out of date. Not only will nine persons out of ten judge of the wine by the bush, but the whole ten will require some sort of advice as to where the wine is to be found When population becomes as dense as is that of Europe, an index is the first requisite to make anything known; and a good salesman is the first and most necessary agent to obtain or to keep a market.

Now in all our discussions as to tariff and trade, the salesman has been left entirely out of sight. The principle adopted has been that of the old proverb that we have quoted. Of course, there are the private and competitive efforts made by different manufacturers to sell. There is, as above remarked, the ever-extending advertisement system. But, for a recognition of the master fact that when nations are in any way interfering with private traders, a nation, in order to become or to keep rich, must organise a great selling power, we find not a hint given by the doctors of political economy.

For this, forty years ago, there was a good practical excuse. England then had a sort of monopoly of production. Thanks to Watt, to Stephenson, to Arkwright, and to others, we had such a start in the great race of production that customers were ready for all that we could produce. And for nothing were customers so ready to pay as for our machines. Foreign countries courted our engineers, borrowed freely our money, bought all that we could supply them with better and cheaper than they could produce it themselves; and, above all, bought our textile machinery, our engineering machinery, and our primary appliances for the aid of industry.

And thus, year after year, a wider and lower level was attained. Each year other countries became more able to do for themselves what we had taught them to do. As they did so, so they built up tariffs to encourage their own home productions, and to keep out ours. According to theory, they were wrong in so doing; but, in point of fact, so they did. According to theory, they impoverished themselves by the unnecessary prices which they paid for much that they could have got cheaper from us. According to fact,—look at the account recently given in these pages of the growth of New York!

In the discussion which is already ringing in men's ears wherever they most do congregate, it will be well, therefore, to consider what steps have been taken, or what steps may be taken, to secure for the industry of the nation, as a whole, that market which every trader strives to secure for himself, generally at the cost, to some degree, of his rival.

To this it may be said, the nation, as a whole, can and should do nothing to ensure a sale. It is the accumulation of the individual efforts of the private traders that will attain this vital end.

This might be perfectly true if we had fair play all round. But other nations do not think so; other nations take national steps to secure markets for themselves at our cost, to keep us out by bounty or by duty. It is plain that private effort cannot contend successfully against national effort. If it could, the latter would cease to be made. Forty years ago, something very different was expected. We have hinted at one main cause which has entirely altered the face of the markets of the world. The least that wise men can now do is to endeavour to understand the case by ascertaining the actual facts. Those are frightfully behind the day who would apply to actual circumstances the sanguine (and, as it turned out, wholly incorrect) anticipations made at a time when we were to a great extent the only steam power and machine manufacturers in the world.

If it be thought that this consideration has weight rather on one side than on the other, we cannot help that. It is not because it leads to an agreeable or to a disagreeable conclusion that a method is good. Whatever may be the outcome of the investigations, we feel certain that a thorough inquiry into the neglected subject of the selling power and machinery of the nation must precede any wise and exhaustive reply, in any sense, to such an appeal as that signed by Mr. Armit.

Another point, the discussion of which may perhaps tend to modify preconceived opinions, has also to be borne in mind. The year 1872 was in many respects that of our greatest commercial prosperity. In 1872 the exports of Bradford were of the value of 8,659,636*l.* In 1880 they had sunk to 1,010,514*l.* Now it is, of course, of vital importance for the men of Bradford to ascertain the causes of this decline in the selling power. But in so doing, it will be necessary to glance also at the history of the preceding thirty years, and to see what causes have been in continued action between 1840 and 1880. We may attribute the decline since 1872 to a wrong cause, unless we are sure that the cause to which we attribute it was not equally in operation before and after 1872.

In 1842 our exports were, in round numbers 50,000,000*l.* In 1880 they were valued at 222,810,520*l.*,—a little more than quadrupled. But our imports had risen in the same year to 409,990,056*l.* Whence comes the balance of 187,179,530*l.* that we have purchased more than we have sold? It is possible that this may be to some degree a matter of account. For instance, if imports and exports be both valued at the shipping port, the value of freight is included in one case, and not in the other. A part of our profit would thus escape notice. But, however it may be, one of the first steps towards a thorough thrashing out of the subject must be to show how the 409,990,056*l.* of imports are paid for. No one sends imports as presents. In one way or another, sooner or later, they must be paid for either in kind or in cash. When the men of Bradford see trade leaving their town as above stated, they would not be the men they are if they were contented with being told that "they must have their downs as well as their ups." The wise and prosperous tradesman is he who has many, if small, ups, and no downs. It is a matter of hope and encouragement to see the working men of England endeavouring to ascertain for themselves the true causes of these very startling and menacing "downs."

ST. MARGARET'S, WESTMINSTER.

The thoughts of many have been recently directed to Westminster Abbey, and the occasion is taken advantage of to revive the often-made suggestion to remove bodily its too near neighbour,—the old parish church of St. Margaret.

An eminently social contemporary, which by its bright writing and varied information not alone amuses but instructs on many subjects, has very recently informed the public that serious steps have already been taken in this direction. The Duke of Westminster has, it would appear, offered to give rent-free a piece of land in Victoria-street, next the National Savings Bank, on which to re-erect the old church. We have never been amongst those who called for its removal, and cannot join them now.

Built originally as a chapel-of-ease for the monks of the neighbouring abbey, St. Margaret's would appear to have been from a very early period "in danger of down-pulling," to quote the words of Stow, writing now hard upon 300 years ago. But the threat that has hung over the church seems constantly to have been averted. Indeed, it is since Stow's time that have gathered round and in St. Margaret's most of the historical associations that would fight against its removal. The claims of a building which contains not alone the ashes of William Caxton,*—reposing, with a fitness rarely to be met with, under the shadow of the abbey where the most active portion of his busy life was spent,—but the remains of the unfortunate Sir Walter Raleigh, beheaded in the Palace-yard close by, and almost by his side those of the sister of Lord Howard of Effingham, of far-famed Armada memory; of the learned and libellous poet John Skelton, Wolsey's enemy; where rest the earthly remains of the mother of Cromwell and of Katharine Woodcocke, the second wife of Milton; and last, not least, of that most patient and unfortunate of engravers, Wenceslaus Hollar,—to whom we owe a debt of gratitude as the most faithful of the delineators of old London and its monuments,—are not slight. It was in St. Margaret's that garrulous Samuel Pepys was married,—in what a "mighty fine" costume we can imagine,—to the lady of whom he speaks in his Diary so ungallantly; it was at the same altar-steps that pliant and witty Waller was married, so Peter Cunningham tells us, though to which of his wives he does not say. Milton, too, was married here to his second wife, who lies buried in the church; and Lord Chancellor Clarendon, whose wife was the grandmother of two English queens, Mary and Anne. Barbara Villiers, the beautiful Duchess of Cleveland, and Betterton, the actor, are among those baptised in St. Margaret's. As the church has been at all times attended, as it still is supposed to be attended, by the members of Parliament during the sittings of the House, another interest is added to St. Margaret's.†

* A simple tablet erected many years ago by the Roxburghe Club records this fact.

† In the "Antiquities of Westminster," by J. Smith, of antiquarian and artistic fame, among its numerous and valuable illustrations is a reproduction of the title-page of the Warner edition of the Book of Common Prayer, in which is given an interior view of St. Margaret's, with the old pulpit and the Speaker's pew.

St. Margaret's has long shown with pride its famous painted glass window, whose story is a very odyssey of woes and escapes. Sent originally from the quaint old Dutch town of Dort for Henry VII. for the chapel in Westminster Abbey which bears his name, it never reached its destination. Prevented in the first place by the death of the king, it was given to the abbot of Waltham. After escaping the dangers consequent on the dissolution of the monasteries, it found a resting-place in the chapel at New Hall in Wiltshire, and afterwards at Epping; and the window finally reached St. Margaret's (1758), within a few yards of the building for which it was originally destined. Here it has remained,—well protected exteriorly by a plate-glass window,—ranking among the best specimens of the glass-painter's art we possess in England. The church contains not a few other interesting artistic features which cannot fail to strike the appreciative eye; the altar-piece, a wood-carving which the sexton, at any rate, is certain is the work of Grinling Gibbons; the stalls admirably restored; the few pieces of old woodwork left, patching the lighter and more modern addition; a number of curious monuments on the walls; and some modern painted glass windows not the worst of their kind.

St. Margaret's, it will be seen, is an ancient church, dating indeed originally from the time of Edward the Confessor (eleventh century), by whom it was built near the abbey, solely to relieve the larger building of duties as a parish church. In the reign of Edward I. (thirteenth century) it was rebuilt at the expense of the wealthy merchants of the Staple. It has since been largely repaired more than once, and quite lately.

With such a history as we have here incompletely sketched, the objections to its removal are strong,—too strong, as it seems to us, to be overcome by the slight damage the church is thought to inflict upon the abbey. That it hides part of the latter in certain positions seems to us no great evil,—there is no advantage in seeing everything at once,—and as we have long ago urged, it serves as a scale by which to measure the abbey, and so increases its apparent size and consequence.

STRAWBERRY HILL.

The recollection of the sale of the contents of Strawberry Hill, just nine-and-thirty years ago, can hardly have faded from the minds of our readers; and now the world learns with some little astonishment that the sale is about to be repeated, with this difference, that it is the mansion itself and not merely its contents that is about to be dissociated from the names of Walpole and Waldegrave, with which it has been linked for above 130 years. A few memoranda relating to the early history of a place so full of historic and classical memories can scarcely fail to be of interest to our readers.

Two hundred years ago even the name of Strawberry Hill was unknown; but when George the First and Second were kings, there was a strawberry garden on sloping ground, some 300 yards from the Thames, on the high road between Twickenham and Teddington. In or near this garden, the coachman of Lord Bradford,—the squire of the latter village,—erected out of his savings a small cottage, which he let out as "apartments" to the London friends of Pope and other resident gentry. Colley Cibber, Bishop Talbot (of Durham), Lord Carnarvon, and other persons of title lodged here during the heats of the London season; and two elderly ladies, named Chenevix, would seem to have taken a lease of it, in the hope, doubtless, of making money out of it, having retired from business as the keepers of a toy-shop at the West End. Horace Walpole, a younger son of the great Sir Robert, had turned in early life a virtuoso or antiquary, and wanted a spot which would accommodate his treasures better than a small lodging which he had taken at Windsor, and which he compared to the "tub" of Diogenes. He came, he saw, and was conquered; he purchased the lease of the Misses Chenevix (who, when they called to see him, complained that they were treated with old cabinets instead of with tea), and afterwards became the freeholder. His acreage at first was small: only a cottage, a garden, and a sloping meadow. But it was not difficult then to buy land ten or twelve miles from London; and his two or three acres gradually grew to fourteen, and eventually to forty or fifty. (The house, we may add, is now offered for sale with fifty-one acres of ground, exclusive of Little Strawberry Hill, which comprises nine or ten more.)

Horace Walpole tells us a good deal about this place in his amusing letters. He first settled here in June, 1747. Under that date, he writes:—"You perceive by my date that I am got into a new camp, and have left my tub at Windsor. It is a little plaything house that I got out of Mrs. Chenevix's shop, and is the prettiest 'bauble' you ever saw. It is set in emerald meadows with filigree hedges;

> A small Euphrates through the place is roll'd,
> And little fishes wave their fins of gold.

Two delightful roads, that you would call dusty, supply me continually with coaches and chaises. Barges, as solemn as barons of the Exchequer, move under my window; Richmond-hill and Ham-walks bound my prospect; but, thank God! the Thames is between me and the Duchess of Queensberry. Dowagers as plenty as flounders inhabit all around, and Pope's ghost is just now skimming under my window by a most poetic moonlight. . . . . The Chenevixes had tricked it out for themselves; up two pairs of stairs is what they call Mr. Chenevix's library, furnished with three maps, one shelf, a bust of Sir Isaac Newton, and a lame telescope, without any glasses."

The above is Walpole's own account of the place to his friend, the Hon. H. S. Conway. About the same time he wrote to Sir Horace Mann:—"The house is so small that I can send it you in a letter to look at. The prospect is as delightful as possible, commanding the river, the town, and Richmond Park, and being situated on a hill descends to the Thames through two or three little meadows, where I have some Turkish sheep and two cows, all studied in their colours for becoming [*sic*] the view."

Such was the spot which Horace Walpole resolved to turn by degrees into a sort of enchanted castle, where the rigid and stately rules of architecture should be defied, and a natural simplicity in gardening should be studied, whilst a picturesque and almost monastic antiquity should be apparent in every lineament of the house. Very shortly after he became its owner, he resolved upon enlarging the house and extending its grounds; and it is not a little startling to compare the above prosaic account of it as it was when he took it with his own poetical picture of what it was exactly thirty-one years afterwards. The following are the lines referred to; they are from a note of invitation to Lady Blandford:—

> "Where silver Thame from Twick'nam's emerald meads
> To Teddington his winding current leads;
> Where at an obelisk three highways meet,
> There stands an ancient ivy-mantled seat,—
> Yet still less ancient than its ancient lord
> (If Ra'ter true and Catherine Clive record).
> With storied windows in the mansion right,
> That half enrich and half exclude the light;
> Shields, sabres, spears of Saxons, Goths, and Gauls,
> Trophies of better days adorn the walls;
> With many a portrait saved from time and flames,
> Of sages, warriors, and their beauteous dames."

Walpole became, so to speak, his own architect, in the enlargement and fitting up of his newly-acquired mansion. He resolved that the ornamentation throughout should be of the Gothic style, and in order to carry out his ideas in that respect, made a tour through various parts of the kingdom, during which he collected models from the principal cathedrals in which that species of architecture prevails. It must be owned that the result was a very singular admixture of battlements and crocketed pinnacles, and doorways, windows, and mouldings of all styles, from Norman to Elizabethan, together with a museum of "nick-nacks, rarities, and curiosities."

The house,—which Horace Walpole and his friends from the first familiarly shortened into "Strawberry,"—was still a small "toy," or little more, when Pulteney, Earl of Bath, thus celebrated it in a mock-heroic song:—

> "Some talk of Gunnersbury,
> For Sion some declare,
> And some say that with Chiswick House
> No villa can compare;
> But all the beaux of Middlesex,
> Who know the country well,
> Say that Strawberry Hill, that Strawberry
> Doth bear away the bell."

Mr. J. F. Murray, in his "Environs of London" (1842), sums up the appearance of the house and its surroundings in the following words:—"A place intrinsically more paltry does not exist: dirty, dingy walls, rough casted with mortar and pebbles, and surmounted by wooden battlements, of which the founder himself survived three generations: bounded on two sides by the high road with all its dust, noise, and publicity; the rooms low, dark, and, with the exception of the long gallery, devoid of proportion; the grounds limited to a very small space, and that limitation rendered still more conspicuous from the attempt to crowd into it temples, grottos, and statuary. The only merit of Strawberry Hill is one with which Horace Walpole had nothing to do, namely, the view of the river commanded by this piece of architectural jim-crackery. Walpole seemed altogether to forget, in what he chose to call his restoration of the pure Gothic, that the essential character of that style is grandeur and sublimity; and that, without space and magnitude, all examples of the Gothic must be contemptible."

But it is time for us to hasten on to a description of the house as it must have appeared in its prime just a century ago. Fortunately we have abundant material in Horace Walpole's chatty letters, and his huge volume of the Ædes Walpolianæ. We shall see that it has soon grown out of a cottage into somewhat formidable proportions. He began his "improvements" in 1753, in which and the following year the library and the great parlour were newly built; the "Holbein chamber" was constructed in 1759; and in the two following years the gallery, round tower, great cloister, and cabinet were erected; in 1770 the "great north bed-chamber" was completed, and in the course of the next six years the "Beauclerk * tower" and the "hexagon closet" were added to the structure. In his description of the villa, Walpole himself writes:—"The castle was not entirely built from the ground, but formed at different times by alterations of and additions to the old small house." He calls the place "a fantastic fabric," a "romance in lath and plaster." On the completion of the building an elaborate description of it, together with an inventory of its contents, was drawn up by Walpole. In it he writes:—"Entering by the great north gate, the first object that presents itself is a small oratory inclosed with iron rails; in front an altar, on which stands a saint in bronze; open niches and stone basins for holy water. . . . . On the right hand is a small garden parted off by an open screen taken from the tomb of Roger Niger, bishop of London, in Old St. Paul's. Passing on the left by a small cloister is the entrance to the house, the narrow front of which was designed by Richard Bentley, only son of Dr. Bentley, the learned master of Trinity College, Cambridge. Over the door are the three shields of Walpole, Shorter,† and Robsart."

Pennant, in his "London," mentions among the treasures of this place a specimen of the skill of Cavalini, who was brought hither from Italy by Ware, abbot of Westminster, about the year 1256, to decorate the shrine of Edward the Confessor. It was a shrine from the Church of Santa Maria Maggiore, which he placed in a chapel in his gardens. It was originally erected in 1255, over the bodies of the martyrs Simplicius, Faustus, and Beatrix, by an Italian noble and his wife. It was made of the same materials with the shrine of St. Edward, and adorned with twisted columns of the same fashion, though differing from it in other details.

As seen from the garden, the house appears to be an irregular structure of three floors, with boldly projecting bays, battlemented throughout, with pinnacles at the angles, and a large round tower and spire towards the western end. Of the interior, as left by Walpole, his own description of the "refectory or great parlour" may serve to convey an idea of the whole:—"It is 30 ft. long, 20 ft. wide, and 12 ft. high, hung with paper in imitation of stucco. The chimney-piece was designed by Mr. Bentley; upon it stands a fine Etruscan vase, between two bottles of black and gold porcelain." This chamber is now the Study, and from its windows is obtained a good view of the garden and river. Walpole constructed a large number of rooms for the display of his miscellaneous collection of art-treasures, and many of these have been converted into bedrooms and so forth. What were known as the "state" rooms still remain as such, and others on a far larger scale have been added. The Gallery,—with its ceiling of fan-tracery and its Gothic recesses,—though not the largest in size, is the most remarkable room in the house, and does not appear to have undergone much alteration since Walpole's time, excepting in the

* So named after the beautiful and witty Lady Diana Beauclerk.

† This was the maiden name of Horace Walpole's mother.

decorations. The female portraits in this room, sometimes named "the Waldegrave Beauties," were all painted by Mr. James Sant, R.A. The staircase appears to have been made more commodious than it was originally, and is ornamented with a marble statue, by Noble, of Frances, Countess of Waldegrave.

The chamber which Walpole denominated his "Breakfast-room, one pair of stairs," is now known as "Lady Waldegrave's Morning-room." The remainder of the rooms, as they now appear, are thus described by Mr. James Thorne, with his usual minuteness of detail, in his "Environs of London":—

"The Library is most likely what it was originally. As of old, the books are arranged in presses within the Gothic arches of pierced work, and look as though they might be of Walpole's selection. Above are portraits, some, we believe, the same as hung there in Walpole's day. The ceiling, 'painted by Clermont, from Mr. Walpole's design drawn out by Mr. Bentley,' retains all the shields, symbols, and devices which he has described with so much parental fondness.

The great North Bed-chamber is now a sitting-room, for which, being light, well proportioned, having a cheerful outlook, and handsomely furnished, it is far better adapted than for a bed-chamber. Its chief ornaments are portraits, among which are Walpole's favourite niece, the Duchess of Gloucester, by Reynolds, and his hardly less favourite friend, Lady Di. Beauclerk, by Powell.

The New or West Wing, added by the Countess of Waldegrave about 1860-62, agrees in general style with the rest of the building, but is more solidly constructed, and the rooms are on a larger scale, and loftier. The large dining-room is a noble room, lit by three great windows by day, by sun-burners in the evening. The ceiling here, as in all the new rooms, is of stucco work, corresponding to those of Walpole's designing; and the great chimneypiece is of stone, elaborately carved. Among the portraits on the walls are King James II., and James, second Earl of Waldegrave, by Reynolds, very fine.

The Great Drawing-room is a very large and splendid apartment. Its grand ornament is Reynolds's masterly group of the three Ladies Waldegrave, daughters of James, second Earl, which excited such general admiration at the second Exhibition of National Portraits, 1867. It was painted for Horace Walpole, and Reynolds was long in finishing it. When he got it home, Walpole wrote to Sir Horace Mann that it was 'a charming picture,' but he grumbled somewhat over it to Pinkerton. 'Sir Joshua,' he said, 'gets avaricious in his old age. My picture of the young Ladies Waldegrave is doubtless very fine and graceful, but it cost me 800 guineas.' ('Walpoliana,' p. 159.) Under this picture is a gorgeous Mediæval coffer, carved and gilt, with a long painting in the front panel that contrasts curiously in its minute finish with the breadth and richness of the masterpiece above. On one side of this is Magni's charming marble statue of the Reading Girl, on the other a seated Bacchante with Tambourine. Among the portraits are Maria Walpole, wife of the second Earl of Waldegrave, by Reynolds, a charming picture of a mother and child, exquisite in feeling, colour, and execution; Martha and Theresa Blount,—Gay's

'Fair-hair'd Martha
And Theresa Brown';

Sir Robert Walpole, first Earl of Orford; Horace Walpole and Mrs. Damer; Lady Mary Faulkner, by Liotard; Laura and Charlotte Walpole, daughters of Sir Edward Walpole, by Ramsay.

The end of the billiard-room is occupied by a composition, by Dickinson, of the Gladstone Ministry, with life-sized portrait of Gladstone seated on the right, Lowe and Bright on the left; beyond them the Duke of Argyll, and standing behind him Lord Carlingford, the lord of Strawberry Hill, for whom the picture was painted. The other members of the Cabinet are in their several places, and all, as far as we recognised them, are faithful portraits. In this room are also at present (1876),—for most of them must be taken subject to removal elsewhere,—portraits of Frances, Countess of Waldegrave, by Dubufe; Lord Carlingford, by Tissot; Sir Robert Walpole, Earl of Orford, half-length, standing, with coronet by side; James II. by Kneller; George I., &c.

In an adjoining reception-room are portraits of Henry, first Lord Waldegrave, and of his wife Henrietta Churchill, both by Kneller, and favourable examples of his pencil; James, second lord, and first Earl of Waldegrave, and companion picture of his wife, Mary Webbe. Catherine Shorter, wife of Sir Robert Walpole; Princess Amelia, by Reynolds. On the staircase a full-length of John Braham, in theatrical costume, by Healy; and one of John James, sixth Earl of Waldegrave."

Though it was the interior of his house, and the society which it collected, that Horace Walpole loved the best, yet he took a great pleasure in planting the grounds around his new villa, and would talk in a very learned strain with his nurseryman and his gardener, whom he took largely into his confidence.

So thoroughly did Strawberry Hill, under Walpole's rule, become the head quarters of fashionable society, that it has been remarked, almost as much in earnest as in jest, that "the lesser court of King Horace at Twickenham has proved no contemptible rival to the greater court of King George and his Queen at St. James's."

Here Walpole was honoured with visits from George III. and his Queen, the Prince and Princess of Wales, and all the *élite* of society, and his breakfast and dinner parties became famous. One visitor, who was always welcome here, because of the amount of scandal which she had on hand, and the fearless and witty sallies with which she would retail it, was Audrey, Lady Townshend, a person "notorious in West-end society for her free speech and freer manners." Horace Walpole, however, delighted in her company. "She would come bursting in upon him at Strawberry Hill," writes Mr. Percy Fitzgerald in his "Life of Charles Townshend, Wit and Statesman," "and rush all through the house, exploring, and enlivening her explorations with the drollest commentaries. We can see her struggling up the little stair, all but sweeping away the China monsters, and hear her saying to the owner, 'Lord God, what a house!' . . . We can hear these two gossips sitting down to discuss a piece of authentic scandal. 'But was there proof?' asks Horace, doubtfully, on some wicked anecdote being told. 'Proof, indeed?' replies the lady; 'why, she was proof all over.'" It was she who declared that Strawberry Hill would be a very pleasant place if *that* Mrs. Clive's face did not rise upon it and make it so hot! She lived till eighty-seven, entertaining company at her house at Whitehall, being long separated from her husband, and left her fortune to her grandson, afterwards Lord John Townshend.

Thomas Babington Macaulay was brought to Strawberry as a visitor when quite a child, "dressed in a green jacket, with red collar and cuffs, and a frill at the throat, and white trousers." To his dying day he is said to have carried in his head a catalogue of Horace Walpole's collection.

Walpole's neighbour, Lady Charleville, told him that when she had some company at her house, some of them had come over to see Strawberry Hill. "Pray," asked one of them of another, "and who is that Mr. Walpole who lives at Strawberry?" "Lord!" cried another, "don't you know the great epicure, Mr. Walpole?" "Pooh!" said a third; "a great epicure! you mean the antiquarian." Not a bad example, this, of the truth of the poet's well-known line:—

"Nec vixit malè, qui natus moriensque fefellit."

Among the art-treasures dispersed at the sale which took place here in 1842, and of which mention was made at the opening of this paper, was the celebrated clock (now at Windsor Castle) presented by Henry VIII. to Anne Boleyn, and which came into the hands of Horace Walpole through Lady Elizabeth Germaine. It is described by Horace Walpole as of silver-gilt, richly chased, engraved, and ornamented with fleurs-de-lys, little heads, &c. On the top sits a lion holding the arms of England, which are also repeated on the sides. On the weights are the initial letters of Henry and Anne, with true lovers' knots, and mottoes above and below. This clock was purchased at the Strawberry Hill sale by Queen Victoria.

Here Horace Walpole set up a private printing-press. Here he printed, in 1758, in two duodecimo volumes, his "Catalogue of Royal and Noble Authors." At first, as Lady Hervey tells us, "he did not intend to have any printed except what he himself printed and gave away; but the demand has been," she adds, "so very great, that, to avoid disobliging people, he has at last allowed his own printer to print and publish an edition for his [the printer's] advantage."

"We naturally expect to find at Strawberry Hill," writes the French author of a "Tour in England," in 1825, "a monument of the imposing architecture of the Middle Ages. But the castle, though a model of taste and elegance, may more properly be called a Gothic building in miniature. It is the villa of a wealthy man of the world rather than the manor-house of a feudal baron. . . . . I should prefer more simplicity and less correctness. . . . . The apartments are fitted up and furnished in a style corresponding with the exterior of the building, the ceilings, niches, and other details of the architecture being imitated from the picturesque decorations of cathedrals, abbeys, and other Gothic edifices. Horace Walpole has been reproached for a certain degree of meanness towards artists; but the pictures and treasures of antiquity which adorn Strawberry Hill would be worthy of a royal gallery. . . . Everything was calculated to intoxicate this English Vathek in his elegant palace. Strawberry Hill was visited by artists, who looked upon its owner as their Mæcenas; by titled courtiers, who came to learn from him the tone of good company; and by the brilliant beauties of the day, who were happy to pay with a smile for the honour of figuring in Walpole's amusing chronicles."

Twenty years later, after Strawberry Hill had been dismantled by its then owner, the Earl Waldegrave, who converted its plates and Japanware and nick-nacks, that so fittingly decorated its rooms, into hard cash, the rickety structure began to show signs of decay; the walls cracked, the plaster peeled off in patches, windows had to be boarded up,—every part, in fact, appeared fast dropping into unsightliness,—"a wretched modern lath-and-plaster ruin."

About twenty years ago, when Lady Waldegrave became the owner of the property, the building was rescued from its semi-ruinous condition. It was enlarged by the addition of a new wing, and the interior refitted throughout; so that, as it now stands, Strawberry Hill may be said to be a renewal of Horace Walpole's house, combined with the additions of modern sumptuousness and the requirements of modern habits. Lady Waldegrave was a daughter of the late John Braham, the singer; her mother was a sister of a medical man, Mr. George Bolton, of whom a good story or two is told by the Rev. J. Richardson, in his amusing "Recollections."

It has been the fashion with superficial writers to disparage Horace Walpole as a foolish and selfish *dilettanti*, and one who lived a frivolous and useless life. Doubtless he was neither a great man, nor a statesman, nor a really learned man; except his correspondence, there is but little to admire in his efforts as an author. But some little credit is due to the originator of Strawberry Hill for having paved the way for that taste for Gothic architecture which, two generations later, found its true expression in the designs of the elder Pugin and Sir Gilbert Scott. Further credit also attaches to his name as having been, along with Pope, the author of that revolution in horticultural taste which substituted the picturesque for the stiff style of horticulture which is associated with Dutch canals, Italian gardens and terraces, and the designs of Le Notre and his school. It will be remembered that Addison, in his *Spectator*, threw out some hints on the improval of landscape gardening; and Pope, in a number of the *Guardian*, which is as amusing as a scene in Molière, disenchanted our ancestors of their love for yew-trees metamorphosed into giants, dragons, and other monsters. His humorous catalogue of trees ready cut for sale contributed in some measure to restore to their right place the mutilated branches of natural oaks and elms; and in his epistle to Lord Burlington the poet lays down some sensible and tasteful rules as guides for the new English school of gardeners. It was Pope who put an end to the formal lines of Dutch gardens by his lines of censure on the place in which

"Grove nods to grove, each alley has its brother,
And half the garden just reflects the other."

But, when he wrote thus, he little knew to what an extent his views were destined to be confirmed by the practice of his courtly neighbour at Strawberry Hill.

A Caen Stone Font, with marble columns, has recently been placed in St. George's Church, Newcastle, Staffordshire. It is the work of Messrs. Jones & Willis.

CONTINENTAL GATHERINGS.

Few questions have received more careful consideration of late days than that relating to the dwelling-places in our great cities of the daily-increasing number of our industrial workers. Census after census,—and in every country the same rule is observable,—points to the gradual inpour of the country populations to the great centres, where fit accommodation, in spite of the activity of the building trade, becomes each year more hard to find. It is not now for the first time that reports of the difficulties in this direction met with by the working population of Paris reach us, and yet in the midst of a building activity in the French metropolis that resembles that of the period of the late Empire, the dwelling accommodation of the working classes becomes scantier and scantier, with fatal results to the observation of the laws of hygiene. Not many days since, at a meeting of the French "Académie des Sciences morales et politiques," a pamphlet on this important question was presented to the members. Dr. Marjolin, in this little work, warmly calls, in the name not alone of society and of medical sanitation, but of morality, attention to the unhealthy dwellings of many of the Paris working people. From statistics (of no later date, it is true, than 1866) he shows that in Paris out of 40,000 families, no fewer than 26,000 possessed for their home *but one room*. Half a century since our author recalls that in an admirable work on "The Dangerous Classes in the Population of our great Cities," Fregier had pointed out as a crying necessity the consideration of the dwellings of the unhappy poor; more than thirty years ago, Ad. Blanqui had presented to the French Academy a report on the situation of the working classes, a report in which he had traced a harrowing picture of the state of the homes of the Paris poor; and only recently, in the pages of the *Revue des Deux Mondes*, the same burning question has been ably treated by a competent authority. In the "embellishments" of Paris, for which the Parisians and France at large have had so largely to pay, the supply of cheap dwelling accommodation for the working classes has been overlooked; rents rise yearly as streets and *boulevards* cut through neighbourhoods which formerly supplied ample, even if scarcely suitable, accommodation for those driven now far from the centre. Paris is unlike London, not alone in the fact that it is confined within walls, but that the movement towards our suburbs in every direction which may be said to have been in progress with us for more than a generation is comparatively unknown on the banks of the Seine. That strange anomaly of a part of London called "The City,"—a busy bee-hive by day, a deserted wilderness of unoccupied warehouses and offices by night,—is unknown to the Parisian; and hence, with ever-increasing rents, cheap accommodation becomes a sheer necessity. The disappearance of the small and not over-rented dwellings which formerly existed in sufficient number has created a series of difficulties, and with them a series of dangers, to which, it is ably pointed out by the author of the pamphlet presented to the French Academy, neither the moralist nor the public have the right to close their eyes. After showing clearly the extent and gravity of the evil and the peril, Dr. Marjolin submits his suggestions for a remedy; this, to some extent, he sees in the erection near our great cities of large groups of industrial dwellings, separated from each other; in the multiplication of the means of cheap transport; in an abundant water-supply; and a well-organised system of inspection of the dwellings of the poor. Here, as in everything and everywhere (Dr. Marjolin quotes from Villemain the historian), the work of humanity is a work of politics.

Not long after the completion of Cologne Cathedral, amidst rejoicings which were reported in these pages, the professional world was informed that the restoration and completion of Strasburg Cathedral were to be next proceeded with. We now learn that a similar work is in active operation in the venerated minster of Aix-la-Chapelle, where repose the ashes of its founder, the Emperor Charlemagne. An architectural interest of a more than ordinary nature is attached to this cathedral,—the characteristic conception in the chilly north of the Oriental traditions which Charlemagne had learned in Italy, and more particularly in Ravenna, to admire. For more than two centuries the eastern façade of the cathedral has been widowed of its tower; this is now being restored from the original designs. The subscription-list has been generously filled, the German emperor being foremost among the donors. While the tower is rising, the restoration of the interior of the cathedral is rapidly progressing. The interior of the cupola is, we learn, being decorated by Venetian workmen with works in mosaic designed in harmony with the rest of the edifice. It might be far from encouraging thus to learn that Aix or Aachen Minster was undergoing restoration, were it not that the temple which overshadows the great emperor's tomb possesses too marked a character of its own to be seriously injured, as it is not difficult to feel is the case with Cologne. Indeed, we hear that the citizens of Strasburg have entered a protest against the proposed completion of their spireless minster, so familiar and beloved a feature has it become.

Paris promises to have added to its already picturesquely-broken sky-line a new architectural feature of decided novelty. The Japanese colony have, we learn, determined on the erection of a pagoda, the architect of which will take as his model the pagoda of Yokohama. London, amidst the now heterogeneous collection of its architectural adornments, will soon be outdone by Paris, unless indeed we include Sir William Chambers's quaint conception, the famous pagoda at Kew, intended, we suppose, to give "local colour" to the views he carried out on "Oriental Gardening" acquired during his youthful travels in the East.

The works for the isolation of the Pantheon at Rome,—referred to in these pages some months since,—are steadily progressing, and will, we learn, be shortly completed. In presence of the Italian Minister of Public Instruction, the demolition was commenced of the last block of houses, situated at the corner of the Via Rotonda,—the Pantheon is known to Romans as the Rotonda,—and the Via de la Palombella. Several houses, among them not a few of great beauty, will have also to give way, it appears, at the corner of the Piazza della Minerva. The increase of traffic and population in Rome, and particularly in this now busy neighbourhood, has rendered these somewhat ruthless steps necessary. The grand pile of the Pantheon will soon be seen freed of the paltry additions of later centuries.

THE BRUNSWICK BUILDING EXHIBITION.

Some years ago an exhibition of matters connected with building and architecture took place at Brunswick, which, although on a small scale, was sufficiently a success to encourage its promoters to enlarge the scope of their plans, and repeat the experiment in a more extensive form. The present exhibition is not a local one, though the city and province of Brunswick send 38 per cent. of the exhibits. The entire German Empire has contributed to the collection, and amongst the 473 exhibitors, only three are from another country, these being from Austria.

The official catalogue states that the object of the exhibition is to bring together as completely as possible the raw materials used in building, the tools and machinery employed in their preparation, and architectural manufactures produced by hand or machinery. The scheme of the committee has been comprehensive, and if in admitting furniture stuffs, carpets, &c., it has, perhaps, exceeded the strict limits of its object, yet this is not to be regretted, for, from a practical point of view, such products are so intimately allied with decorative art that the general effect gains materially from their admission.

Like other exhibitions, that of Brunswick has had much to contend with from the fact of many "declarations" having been made at a late period; and thus on the opening day (July 1st) much remained to be done. The efforts of the directors have, however, been fairly successful, and no doubt much of this success can be attributed to the co-operation of the Builders' Association of the city of Brunswick and the Architects' and Engineers' Association of the Duchy. In connexion with the former, we notice that the president, Herr Albert Niess, has been foremost in carrying out the scheme. The site is one which belongs to a large banking company, having previously been used by a carriage factory. It required, therefore, but little alteration. The superficial area is about 22,000 square yards, of which, roughly speaking, one half is occupied by the building itself, and the other by the grounds.

The jury is composed of forty-eight members, one-half being nominated by the exhibitors. The railway companies have given special facilities to visitors, and tramways run to the Exhibition from the city. Postal and telegraphic communication exists in the building, and every provision has been made for the comfort of visitors by opening *restaurants*, &c. A band of music plays every evening in the park, and the Exhibition thus makes a bid for popular favour, as well as for the support of the class which it specially interests. With this view the price of admission every evening is only 3½d., and in the daytime varies from 6d. to 1s., according to the day of the week.

Being only a temporary erection, the architectural features of the main building are in keeping with its purpose. It is designed by Herr Bohnsack in Renaissance style, and he avails himself with success of the opportunity afforded him of displaying his talent for coloured decorations, which, under his guidance, serve to brighten the general effect. Above the entrance is an allegorical picture of Brunonia, extending her arms over the people, the commerce, and the arts of her province.

Proceeding now to examine the various exhibits in the ten groups of subjects, with their sub-divisions, it is immediately evident that the project has met with hearty support from the different branches of the building industry. Our space does not permit us to enter into the comparative merits of the different exhibitors, and consequently in selecting only a few for mention we do so for the sole purpose of giving our readers a general idea of the scope of the Exhibition.

The brick, tile, and earthenware-pipe trades are well represented, the local brick factory company having appropriately erected the entrance to the grounds. The different kinds of stone now in use are also shown, and we notice that the sandstone fountain, exhibited by Schanz, of Langelsheim, has met with commendation. The stove-tiles, and other pottery of Villeroy and of Braun, have been favourably noticed. The show of ordinary roofing-tiles is spoken of as being rather limited, but of slates of different kinds there is a full assortment. In the same category are exhibited asphalte pavements; and mention is made of a trial of the plan for making them less slippery by cutting them up more or less with furrows, and thus securing some hold for horses' feet.

The class of objects used for the interior of a house is comprehensive, and from the fact that it appeals to the consumer, as well as to the professional body, it is evident that exhibitors have had in view some practical results from their participation in the Exhibition. At the entrance the Brunswick Jute Company shows its wares in the shape of curtains in tasteful but cheap styles. With this exception, however, it is remarked that the show of furniture stuffs is insignificant. On the other hand, the Brunswick carpet trade is favourably represented, having the additional advantage of displaying its wares (though not in all cases of local manufacture) in the shape of a furnished room, in the middle of which a fountain is playing. Another interesting object is the cellar lighted by the patent system of Gebrüder Bredehorst, of Bremen, which is said to be an improvement on English systems of subterranean lighting by reflectors, &c. Other varieties of glass, both ground and stained, for windows, are also exhibited.

The division for gas and water apparatus (including sanitary appliances) is not so complete as might be desired. Special notice has been made of a lustre in the recently much-favoured *cuivre poli* (polished copper), exhibited by C. Kramme, of Berlin.

Amongst the exhibits of woods for building purposes is a curious collection shown by Herr Spehr, of Brunswick. The samples are in the shape of books, and are arranged in library form in a wooden pavilion. On the outside the popular and botanical names take the place of a title, while at the opposite extremity the bark is shown. The sides show the grain, and on one side under glass are inserted flowers and seeds of the respective trees.

The grounds are, as may be imagined, wanting in the shelter afforded by trees, but in every other respect their appearence has elicited commendation of the skill employed in laying out the beds and shrubberies. Amongst the most noteworthy objects is the wine-house, built in

the old German style, now much in vogue, and which attracts many visitors, from more than one cause. The iron furniture for summer-houses and other purposes, of Schäfer, the Hanover manufacturer, is well spoken of. A monument erected in the grounds by Horenburger, a local cemetery mason, shows the inclusive nature of the Exhibition. The pulsometer is to be seen at work, and would seem likely to attract the special attention of those members of the building trade interested in draining operations. The Cork stones of Grunzwerg & Hartmann for the prevention of damp walls are also spoken of favourably. The railway engineering industry is represented by the local signal manufacturers, Jüdel & Co., who show a variety of their inventions.

In literary, artistic, and technological exhibits the success of the exhibition can only be considered partial, and some surprise has been expressed that architectural plans have not formed a feature of the project. The two colossal photographs of St. Peter's at Rome are much admired. There are several collections of technical works; and last, though not least, we have to mention the exhibits showing the process of wood-engraving, which, as an ally of the art of architecture, finds appropriately a place in the exhibition. We have simply drawn attention to some of the leading features of this interesting collection. Locally it is considered a success.

EXTRAORDINARY DISCOVERY OF ROYAL REMAINS IN EGYPT.

A discovery is reported from Egypt of a nature so startling that it is necessary to reflect for a time in order to realise its importance. We do not say that it casts into the shade the successful results of the explorations of Layard, of Schliemann, or even of Mariette, because each great step into the past throws fresh light on existing knowledge. But we cannot remember that on any single occasion so full, complete, and promising a find has rewarded the labours of the archæologist.

It is well known that the pyramids, tombs, and sarcophagi identified as the funereal records of many Egyptian monarchs have been only known to us as empty and void. They have been rifled of their contents at a period so remote that no record has been found of the sacrilege, which has generally been attributed to private or indiscriminate pillage. The present discovery goes far to rebut that assumption, to explain the silent void of many a storied tomb, and to open hopes of the recovery, not of a lost chapter of Egyptian history, but of volume after volume of a record of more than 4,000 years. The discovery, of which we can give but a very imperfect account, has led those men of Egyptian science who have visited the scene to the conclusion, that the relics of the sovereigns of three or perhaps four successive dynasties had been removed by the pious care of the Egyptian priests from their appropriate resting-places, and concealed in the secret subterranean gallery now disclosed, in order to preserve them from desecration at some period of conquest or of revolution.

In June last it was observed that the Bedaween, in the province of Keuah, which includes the ancient Theban house, were offering numerous antiquities for sale at very inadequate prices. It was discovered that the source of this hidden treasure was situated in a gorge of the mountain range which skirts the valley of the Nile, at about four miles to the east of Thebes. Herr Emil Brugsch, a younger brother of the well-known Herr Heinrich Brugsch, was sent to investigate the matter by Daoud Pasha, the governor of the province. Near the famous temple of Deir-el-Bahari he discovered a pit, about 35 ft. deep, cut in solid rock, and giving access to a ancient gallery of some 200 ft. long, which was filled with the relics of the kings of the second period of the Egyptian empire,—the new monarchy, comprising the eighteenth, nineteenth, and twentieth dynasties, which endured for a period of 596 years, from 1706 B.C. to 1110 B.C., under twenty-eight kings. Thirty royal mummies have been found, so that it is probable that the entire series of the kings of the new monarchy have been transferred to that sacred and hidden tomb.

If, however, it is correctly stated that the mummy of Pinotem, the third king of the twenty-first dynasty, is among those discovered, it is probable that the kings of this line (that of Thebes and Tanis), are included in the cavern, together with those of the three preceding Theban dynasties. And what is already known of the invasion of Egypt by Naromath or Nimrod, king of Assyria, resulting in the establishment of the twenty-second dynasty, under Shashank or Shishak I., at Bubastis, about B.C. 980, may furnish the key to the concealment of the royal mummies. It has been the fashion to attribute the mutilation of the Sphynx, the Memnon, and many of the most famous statues of Egypt, to Cambyses. Recent discoveries have done much to throw doubt on the probability of this attribution. Cambyses is represented, as we learn from Brugsch ("Egypt under the Pharaohs," vol. ii., p. 290), on a *stele*, in a kneeling posture, as a worshipper of the Apis bull. Darius also is recorded as showing marked honour to the Apis bulls. Thus the idea that it was the Persian dynasty that outraged and mutilated the gods and kings of Egypt has been gravely impeached on the highest authority. But we think that it is now for the first time that a hint has been given to the archæologist that it was the Assyrian invasion from which Egypt suffered such memorable humiliation,—a view which is in full accordance with the ruthless character of the Assyrian kings, as declared in the cuneiform inscriptions. We commend this view, in all its novelty, to the verification of the patient and learned research of the great students of hieroglyphic and of cuneiform records at the British Museum.

For the rest, the remains of Thothmes the Great, identified among the royal mummies, appeal most forcibly to what we may call the historic imagination. Not less imposing is the discovery of the mummy of the Great Queen, Ha-ta-su or Ra-ma-ka, the sister and predecessor of Thothmes III., who has been recently identified ("Handbook to the Bible," p. 31) with the daughter of Pharaoh who rescued Moses from the dangers of the Nile. Four papyri, we rejoice to learn, have been found in the gallery in a perfect state of preservation, and the largest of these was in the coffin of Ma-ka-ra (or Ra-ma-ka, as the hieroglyphic admits of different order in the reading of the syllables). This precious document, 3,400 years old, is about 16 in. wide, and is estimated to be from 100 ft. to 140 ft. long, or double the size of the great Harris papyrus, the most splendid hieratic document hitherto known to exist. It is beautifully adorned with coloured illustrations. We are unfortunately aware that the great bulk of hieroglyphic inscriptions, as well as of hieratic papyri, is occupied with matter of little value to the historian,—the titles of the gods, the ritual of the dead, and the lists of tributes taken in war, or of offerings made by the king. But it is hardly possible that long documents, written in the most splendid period of Egyptian history, and thought worthy of preservation in the very coffins of the greatest monarchs, can fail to contain very much that will prove of the utmost value to the historian.

Not less than 3,700 mortuary statues, and some 2,000 other objects, have been discovered in this wonderful repository. Among these is a leathern tent, bearing the cartouche of King Pinotem, in admirable preservation. It is covered with hieroglyphics most carefully embroidered in red, green, and yellow leather, with the royal vulture and stars on the corners. Fifteen enormous wigs used on state occasions, and nearly 2 ft. high, are among the collection. Each of the mummies is accompanied by an alabaster urn, containing the heart and entrails of the deceased. Herr Brugsch is of opinion that there is another secret gallery leading from the pit. Whether this prove to be the case or no, what has been actually recovered and conveyed to the Museum at Boulaq forms a contribution to the history of Ancient Egypt of a value which it is impossible to anticipate, and probably not easy to exaggerate. Who can fail to feel a deep regret that the life of M. Mariette was not spared long enough to gratify him with a discovery the immediate value of which will in so great a measure be due to his untiring labour?

An esteemed correspondent recently returned from Egypt makes an observation with reference to this remarkable discovery which merits consideration. He says:—"I wish you would draw attention to the fact (which I think is hardly appreciated) that the actual mummies of some of the greatest men in the history of the world are laid on shelves in some rough buildings called the 'Museum of Boulak,' just as if they were varieties of monkeys or interesting minerals! They ought to be treated with the greatest honour, and placed in a grand solid building erected for the purpose. It is a frightful thought that Rameses the Great should lie on a shelf in a shed,—which might be burnt, or destroyed by an inundation! He ought to be honoured as we honour our kings, and as we hope the 'New Zealander' will honour the remains of our great men when he comes across them in ruined Westminster Abbey. I was much interested with the museum,—there is nothing else like it,—but it is not a resting-place for the great."

FRENCH RAILWAYS.

An interesting article appeared some time ago in a foreign contemporary, dealing with the present condition of the French railway system, both as to construction and working. We quote the following particulars as being of interest to our readers.

The most strenuous efforts have been made by the French companies during the last few years to increase the speed of their trains; in short, diminishing that security against accidents which is the primary condition of railway management. Within a few years the journey from Paris to Lyons has been shortened from eleven to nine hours, and this is pointed out as indicative of the progress made since railway directors have been alive to the necessity of improved services. A further increase of speed is looked forward to at no distant date, and in the face of American railways now running in some cases at over sixty miles an hour (and trying to still accelerate their speed), the writer argues that the French lines, being more solidly constructed, present no obstacles to the attainment of the highest rate now usual in the United States, and the consequent reduction of the journey from Paris to Lyons to five hours.

That this rate is already attained on some portions of the Paris to Lyons Railway is inducing the companies to devote their chief attention to the working of the system of signalling, as the locomotives now in use are quite powerful enough to materially surpass their present usual speed. In addition to this point, the question of brakes is under careful consideration.

Almost all locomotives can now travel with steam reversed. This used formerly to be regarded as a measure only to be used in situations of imminent danger, but is now a system in daily use. The Westinghouse and the Smith brake systems seem to be those receiving most attention at present. Some lines have the Achard electric brake.

Amongst other improvements effected or in contemplation are noted the heating of all carriages, the admission of second-class passengers to certain express trains, the introduction of cushions in third-class carriages, and a more perfect system of communication between passengers and guards.

After giving an interesting account of the different systems of signalling in use, reference is made to the plan by means of which the signal disc which means "stop" is in communication with an electric wire which runs between the rails, and this being touched by a metallic brush on the approaching engine, conveys to the mechanism an electric shock, causing the whistle to sound. In some cases this mechanism is connected with the station-master's office.

The details given as to the application of the block system are interesting, and, while admitting that the French are indebted to England for many of the improvements now in use, it is argued that France has surpassed England in the manner of their practical adoption.

More Christmas Cards.—The Suffolk-street Galleries display at this moment not scores, not hundreds, but some thousands of designs for Christmas and New Year Cards, sent in response to the offer of prizes to the amount of 3,500*l.* by Messrs. Hildesheimer & Faulkner. 1,147 frames are hung, each containing from two to four designs. One hundred sets, if not more, are to receive prizes, the highest amount being 200*l.* Mr. Millais, Mr. Marcus Stone, and Mr. Storey, have agreed to act as judges, and the awards will be made known on Monday next. The Exhibition shows the existence of a large amount of skill up to a certain point, and it includes a few very fine drawings; the great want observable is special character.

GRINLING GIBBONS.

In a recent issue of those charming "Echoes" with which, weekly, Mr. George Augustus Sala interests and instructs the town (we offer our personal thanks to him for much pleasure thence derived), the erudite and brilliant writer asks a question concerning Grinling Gibbons, and makes a suggestion to which we are tempted to give further currency. Mr. Sala, referring to the museum of rarities formed by John Tradescant, King Charles I.'s well-known gardener, says he has before him "a queer, thin, mouldy little book, entitled 'Museum Tradescantianum; or, a Collection of Rarities preserved at South Lambeth, near London, by John Tradescant,'" the date of which is 1656. And, after alluding to some of its items, continues thus:—"*Mem.* I also note a cherry-stone holding ten dozen of tortoiseshell combs, *carved by Edward Gibbons*. Was this fashioner of Liliputian tortoiseshell combs the father of the famous artist in carved work, Grinling Gibbons? Horace Walpole was in doubt whether Grinling was of English or of Dutch extraction. Stokes told Vertue, the engraver, that Grinling's father was a Dutchman, but that the artist himself was born in Spur-alley, in the Strand. Reference to the parish books either of St. Clement Danes, St. Mary-le-Strand, St. Paul, Covent-garden, or St. Martin-in-the-Fields, might show whether a Mr. Edward Gibbons lived in Spur-alley at about the middle of the seventeenth century. A nice opportunity for an artistic antiquary, with plenty of leisure. In the Post-office London Directory, I find Spur-street, Leicester-square, and Spur-inn-yard, High-street, Borough, but no Spur-alley, Strand."

We have no doubt ourselves as to the place of Grinling Gibbons's birth, and that Vertue was wrong. From his Nativity, cast by his contemporary, Elias Ashmole, we learn that he was born, not in the Strand, but in Rotterdam, on the 4th of April, 1648. The figure of his Nativity was discovered by Mr. W. H. Black, among the Ashmole MSS., and may be seen, with many others, in the Ashmolean Museum in Oxford. This was first pointed out in our pages nineteen years ago by Peter Cunningham, who contributed a number of curious entries that he had discovered concerning works by Gibbons.* Peter adds:—"That he was of English descent I see reason to believe; for I find in the Works Accounts of the Crown of the time of Charles I. the mention of *Simon Gibbons*, a skilled carpenter, employed under no less a master than Inigo Jones."

There is no reason, for all that, that Mr. Sala's *Edward* Gibbons should not be looked up.

KENT ARCHÆOLOGICAL SOCIETY.

The members of this Society lately visited Canterbury and its environs.

The twenty-fourth annual meeting was held in the Chapel of East Bridge Hospital, the president of the Society, Earl Amherst, occupying the chair.

The Rev. Canon Scott-Robertson, in his capacity of honorary secretary of the Society, read the annual report, which contained the following passages:—

"Since the last annual meeting the thirteenth volume of 'Archæologia Cantiana' has been issued; its entire cost has been defrayed; the sum of 105*l.* has been invested in Consols; and the Society now has standing to its credit at the bankers the sum of 276*l.* 13*s.* 4*d.* The council therefore feel fully justified in preparing to issue another volume of 'Archæologia Cantiana.' Several sheets of the fourteenth volume are already printed, and it is hoped that the whole may be ready for issue about Christmas. It is satisfactory to the Society to know that its volumes are sought for not only by Kentish antiquaries, but by great libraries at home and abroad. The number of new members who have joined the Society since last July is considerably above the average. Sixty-two have already been elected, and eleven await election. Interesting discoveries of foundations containing Roman masonry have been recently made at St. Pancras ruins, in the cemetery of the ancient abbey of St. Augustine, outside the city of Canterbury. O her discoveries have been made near Canterbury and Wingham by Mr. Dowker. At the Roman castrum of Reculver, the demolition of certain wooden outbuildings has exposed to view a portion of the core of the Roman wall, not before seen. Owing to a slight landslip, this masonry needs to be underpinned. The Admiralty had resolved to underpin it and to face it with new brickwork. Your secretary having represented the state of the case to Colonel Pasley, the Director of Works, who is a member of our Society, that gentleman has most kindly ordered that instead of a complete masking wall, nothing more than piers necessary for support shall be placed over the old wall core. At the same time he expressed his pleasure in being able to comply with the wishes of your council."

The report was adopted, on the motion of the Bishop of Dover, seconded by Sir Walter Stirling.

The hon. secretary then briefly described the East Bridge Hospital building, and as the Company passed down, Mr. James Neale described the interesting wall painting recently discovered in the reception-room.

The visitors then proceeded to St. Martin's Church, on St. Martin's Hill, where the Rev. Canon Routledge read an interesting paper on that ancient edifice. The original church, allowed to fall into partial ruin after the Roman evacuation of Britain, was probably restored towards the end of the sixth century to serve as an oratory for Queen Bertha and her attendant, Bishop Leotard, and re-dedicated to St. Martin of Tours, and portions of that building, he believed, were existing even in the present day. It was very likely that the Romano-Saxon building suffered from the fierce and general ravages of the Danes. It still, however, maintained sufficient reputation to have given a title to suffragan bishops for a period of 350 years (according to one tradition), at any rate for fifty years, till they finally became merged, in the time of Lanfranc, into Archdeacons of Canterbury. He assigned the different portions of the church, as it now stands, to Roman, Saxon or pre-Norman, Norman, Early English, fourteenth-century Decorated, beginning of the fifteenth-century, and end of the fifteenth-century periods. He called special attention to the circular buttress on the south side of the nave, which was very peculiar. It was not unlike a circular projection in the Saxon tower of Sompting, in Sussex. The most interesting of all was the font. Assuming it to be Norman, it was almost unique, as being built up of various stones in different tiers. The controversy as to the date of this interesting relic was too long to be entered upon. It was more than probable that the whole font was pre-Norman, chiselled out into the present pattern.

Mr. Loftus Brock said he knew of no font in England,—but there were some in Wales,—built in the same manner as this was.

The party then examined the exterior of the church, and afterwards moved down to the grounds of the Kent and Canterbury Hospital, where the Roman foundations of St. Pancras Chapel, said to have been consecrated by St. Augustine, have recently been excavated through the kindness of the Bishop of Dover and Canon Routledge. The latter gentleman read a paper descriptive of the chapel and remains, and afterwards made a brief statement as to the excavations. At the western porch there were still standing portions of a wall built with Roman tiles and seashore mortar, pronounced by Mr. Parker to be a Roman wall. They had discovered the foundations of a wall and buttresses exactly corresponding on the other side. Below the surface there were parts of a pavement consisting of coloured and patterned tiles. The foundation walls were composed of Roman tiles with here and there salmon-coloured mortar. That there was on this spot some early Roman buildings, whether of a secular or religious character, was indisputable. The Roman tiles were pronounced to be of a good time, and Mr. Roach Smith says "there can be no doubt of the foundations being those of a rather extensive Roman building." The concrete floors at the east end of the nave and in the southern *porticus* were apparently Roman or Saxon. He believed there was originally a small Roman church, which, falling into partial ruin, was restored by Ethelbert, and converted by Augustine to Christian worship. It was afterwards ravaged by the Danes, then restored by the Romans till in its turn it would fall into decay and be superseded by the Early English church, the last window and chancel walls of which still remain. In the time of Henry VIII. and at the destruction of St. Augustine's, some portion of it would be used as an out-house or stable (and last and worst desecration of all) the chancel of a most sacred and interesting building was turned into a pig-stye.

Mr. Loftus Brock said the Society might indeed be congratulated for having made one of the most interesting archæological discoveries which had been made for many a year. There could be no question whatever that the foundations of the walls which had been laid bare were constructed of Roman brick made for the purpose, and never disturbed since they were erected.

The abbey church of St. Augustine was next visited, and afterwards parties were made up and conducted over the cathedral.

The annual dinner took place in the evening in the Music Hall, nearly 300 ladies and gentlemen sitting down to table.

On the second day carriage excursions were made to Ickham, Wingham, Adisham, Bifrons, Patrixbourne, and Bishopsbourne.

* See *Builder*, vol. xx. (1862), p. 797.

SOME REFLECTIONS FOR THE HOLIDAY SEASON.

We are now well into the holiday season, and the passer-by through most respectable quarters of London and the suburbs, and through those pleasant villas which surround the outside of some of the larger provincial towns, constantly gazes on the dismal spectacle of windows full of newspapers and brown paper, there placed by the prudent mistress of the house. At such a time, when the bookstalls are full of holiday numbers of periodicals, and the booksellers are doing a good trade in guide-books, in light travelling literature, and in "novels for the seaside,"—which, so far as our experience goes, are chiefly characterised by being greater trash than the ordinary yellow-backed novel,—it would not be fitting that we should not also become imbued with the holiday spirit, and place in our columns something, too, of the nature of the holiday literature now so popular. It is an undoubted fact that a knowledge of sanitary science, and a greater care in regard to sanitary matters, are becoming general, and even the householder who is inclined still to pooh-pooh sanitary precautions finds so many friends carefully attending to them that perforce he, too, falls in with the strengthening current. But when we come to the holiday season, all the proper precautions vanish rapidly from the mind of our householder, and paterfamilias takes his wife and children to some seaside lodging-house to enjoy the fine fresh breezes of the cliff or the sands during the day, and at night to breathe all kinds of unwholesome air and gases in the anything but a model lodging-house. Seriously speaking, however, it is lamentable to think of the way in which persons now becoming prudent in sanitary matters at home will take up their residence in lodging-houses where the commonest sanitary precautions are neglected. There is no question that many fatal illnesses are contracted in lodging-houses at sea-side and other holiday resorts, and that many cases of ill-health and spoiled pleasures arise solely from the bad sanitary state of the large majority of lodging-houses. We can call to mind plenty of instances of persons who, when you ask them how they enjoyed their month at Seaview Bay, will tell you that it did not agree with the children,—the air seemed to affect their appetite injuriously, and that, indeed, Mrs. A. had something like a touch of low fever after her return. These drawbacks to the holiday are traceable to the sanitary state of the pretty trellised cottage covered with creepers in which the A. family have been residing for a month, and have nothing to do with a relaxing or bracing atmosphere. Thus there can be no question that, often, so far from benefiting by a change of air, families are injuriously affected, because they locate themselves in houses without taking proper care to ascertain their sanitary state before taking up their residence in their temporary abodes. And the absurd,—one might almost say, melancholy,—thing is that those who neglect these precautions are very often persons whose own homes are carefully looked after in regard to sanitary matters. But if visitors will not insist on having lodging-houses properly ventilated, and with wholesome drains, it is not likely that their owners will, as a rule, take the trouble to make alterations, which often cost what is for them a considerable sum of money. The chief remedy, therefore, for this state of things is in the hands of the visitors themselves, who, if they make a point of going only to lodging-houses which are in a proper sanitary state, will, in no very long time, cause a general improvement in the sanitary condition of all respectable lodging-houses.

But there is yet another means by which the health of visitors to seaside resorts may be improved, and which is feasible if it were only vigorously carried out by influential local persons in our watering-places; and that is, to have the lodging-houses carefully inspected by a person with a sound knowledge of sanitary matters, and then to issue a certificate to such houses as are in a proper sanitary state. There

can be no question that if this were done those houses which were certified would command a somewhat higher rent than those which were not certified, so that it would become a positive advantage to a lodging-house keeper to have his house certified as healthy. But unless the examination were real and thorough, it would be worse than useless to give certificates at all; it would, in fact, be an injurious sham. Now, considering how many energetic and prudent persons are to be found among the local magnates of our watering-places, it would be perfectly feasible to set such a scheme in motion if one or two persons would make the first move. And there can be no question that those places which did so would become at once more sought after, because it would at once be said that they were in a good sanitary state, which would be, *ipso facto*, an attraction apart altogether from the surrounding scenery and the pleasant breezes. In most railway stations our eyes now encounter bright-coloured pictures of various seaside resorts,—the Isle of Man, the Devonshire coast, the watering-places of the Channel. What a potent addition to these pictorial charms would be the announcement that "lodging-houses are examined by a sanitary inspector, and certificates of healthfulness are given." What an opportunity is afforded to the Isle of Man to distinguish itself in this way, and to show the potent effects of "home-rule." We say the Isle of Man, because of late its attractions have been very largely exhibited on the walls of our railway stations, and we have very little doubt, judging by most watering-places, that the sanitary state of its lodging-houses, filled by hundreds of visitors, are not so admirable as its fresh breezes and bright seas. But, as we have said, if local persons will not set to work to make lodging-houses perfectly safe and healthy, it behoves educated and prudent visitors to refuse to enter any house which is not in a proper sanitary state.

FROM GERMANY.

New Harbour at Mayence.—The authorities of Mayence have recently approved the plans of Herr Kreyssig for the formation of a harbour capable of accommodating the increased trade of that city, and some preparatory works are said to be now in progress. The projected basin will have quays 2,200 yards in united length, and will be in direct communication with the railway systems which meet at that point. The present Winterhafen has only about one-third of the superficial dimensions of the new harbour. The total cost of the works now in contemplation, and which will be for about four years in course of execution, is 125,000*l.* The completion of the entire scheme will cost 85,000*l.* more, and this latter part of the work will probably be spread over a series of years.

Fires at Theatres.—The recent catastrophe at Nice has attracted attention to the question of the precautions necessary in the construction and internal arrangements of theatres. In Mayence an examination of the Stadt-Theater (which underwent extensive improvements in 1876) has led to the recommendation of farther measures of security, which are to be immediately carried out. For the safety of the staff, fire-proof staircases are to be erected on both sides of the stage communicating with the wardrobes, workrooms, &c., above. The system of lighting will be greatly modified, the electric light being used as much as possible, even where gas is already laid on, and the efficiency of the water supply will also be increased. The cost will be about 1,800*l.*, of which 70*l.* will be spent in providing the stage with separate gas communication.

Improvements at Cologne.—The works for the enlargement of the city of Cologne are being carried on with much energy. The plans of the railway companies are being discussed with some warmth, and if the reports be correct as to their details, the opposition of the citizens would seem well founded. For instance, it is said that the central goods station will be in the best part of the Neustadt, and that the cathedral will have on two sides the new central passenger station and its surroundings.

The War Monument in Elberfeld.—In the year 1875 a competition took place, in which the sculptor Wilhelm Albermann, of Cologne, took the first prize for the design of the above monument, and received the commission to execute it. The central figure of Germania is 13 ft. high. On each side is a figure. One is a cuirassier, sword in hand, and ready for battle; the other is an infantry soldier, his right hand on his breast, holding a flag, and resting on a captured cannon, with a French standard and other emblems. The unveiling took place on the 30th of July.

FROM ABROAD.

Christian Art Exhibition, Bonn.—An exhibition of objects of Christian art will be held at Bonn early in September, consisting of,—(1.) Architecture, represented by designs and models; statuary and carving in stone, wood, metal, or ivory; painting, including oil-paintings, cartoons and sketches, painting on glass, porcelain, or ivory; enamel mosaics; drawings and engravings, &c. (2.) Art Handicrafts, such as bell-founding, organ-building, goldsmiths' and jewelry work, brass work, &c.; ecclesiastical joinery, carpet stuffs, embroidery, church lace, vestments, printing and bookbinding, church vessels, &c. All merely imitative work is to be excluded.

Museum of Modern Art, Paris.—The mode of reconstructing the burnt portion of the Tuileries, and the appropriation of the new building, have been determined on. A proposal, sanctioned by the legislative bodies, opens a "Credit" on the budget of 1881, amounting to 200,000 francs, for the removal of the ruins of the palace. It has been decided to erect between the Pavillons de Flore and de Marsan a museum of modern art, of which the architecture will, as much as possible, accord with the buildings of Philibert Delorme.

International Exhibition, Vienna.—An international exhibition is to be opened in April, 1882, in Kinsterhaus, and it is reported that any contributions from British manufacturers and artists will be highly welcomed by the Austrian Government, as well as by the artists.

INTERNATIONAL RAILWAY EXHIBITION AT BERLIN.

The committee charged with organising this exhibition, announced a short time ago to take place in 1883, intends to make it a thoroughly representative one, including in its scope a correct picture of the historical development of railways in the several countries taking part in the exhibition, together with a display of the working of railways by the different nations exhibiting. The exhibition will contain, besides railway rolling stock, such as locomotives, carriages of all descriptions, cranes and other lifting machinery, materials used in the construction of the permanent way, signalling apparatus with the electric instruments belonging thereto, as well as station and workshop fittings, levelling and testing instruments, and a comprehensive display of technical literature.

INDUSTRIAL DESIGNS.

DIAPERS.

The designs here given are intended for diapers for terra cotta work, and could be used as panels or string courses for either interior or exterior work.

They are not intended for very high relief, for the reason that the dust accumulates in the crevices and becomes very difficult to remove; this difficulty is multiplied vastly when the design is too delicate in detail or deeply cut. In style they are based upon the Egyptian, that style being selected for its adaptability to architectural work. The bottom right-hand corner diaper has perhaps more of the Assyrian feeling than the Egyptian, but is nevertheless sufficiently true to the style of the others to keep them company. No doubt they will suggest to many viewing them in different lights their adaptability of treatment in other materials. When treated in colour they would necessarily lose much of the severity they now possess, and this, in some cases, might be an advantage.

TILES.

We give a design for single or two-colour tiles, representing either 6 in. by 3 in., or 12 in. by 6 in. If in blues, browns, or yellows, they would be effective, and could be used for dados, stoves, edgings for floor tiles, &c. When the perpendicular stripe would not come satisfactorily, then they could be used equally well horizontally or for string-courses, in a single or treble line to divide a plain tiled surface, and thus cheaply relieve the monotony.

An entire decorative treatment in these tiles alone might be made effective; as, for instance, in a dado used perpendicularly in two browns, with border at the top of the leafage tile, used horizontally, therefore 3 in. deep, the body of the wall in plain tiles of a lightish yellow, judiciously broken by courses in a darker self-colour, singly, two, three, or more wide, as the case might suggest.

When the dado was required to be horizontal, then as a finishing border the leafage still could be used perpendicularly, making a good and decided finish, 6 in. deep. It is an advantage in tile work when the design repeats complete in itself, and at the same time forms a design when in conjunction with others.

PRINCIPAL PORTAL OF LEON CATHEDRAL.

During the recent well-attended Agricultural, Industrial, and Art Exhibition held at Leon, in Spain, a national subscription was opened for the purpose of saving the magnificent cathedral of that city from the ruin with which it is threatened. The historic city of Leon was once the second capital of the ancient kingdom of the Asturias, where Alfonso III. and Fernando I. (both surnamed the Great) were wont to hold their court. Volumes might be filled with a descriptive history of the city, and with sketches of the artistic beauty of the cathedral church, the principal entrance of which is reproduced in the view which we give in our present issue. Leon Cathedral is doubtless one of Spain's architectural jewels, and is inferior only to the sumptuous edifices of Burgos and Toledo. The Spanish nation considers it a national duty to preserve this building, over which, according to the glowing language of an old Spanish writer, "the genius of art shook its brilliant wings of pearls and precious stones for the purpose of embellishing it with treasures."

A small plan of the cathedral will be found in Fergusson's "Hand-book of Architecture." It was commenced quite at the beginning of the thirteenth century, perhaps earlier, and possibly from the design of a French architect.

NEWLANDS, HEATON CHAPEL, NEAR MANCHESTER.

This house has been built for Mr. W. A. Russell-Pavier. The exterior is faced with local red stock bricks, relieved with moulded white brick strings from the Farnley Iron Company's works, Wortley, near Leeds. The stone dressings are from the Cefn Freestone Quarries, Ruabon. The roofs are covered with seconds Velinhelli dark blue slates, the ridges with red roll Staffordshire tiles. The internal joiner's work is of St. John's yellow pine, stained and varnished; the front staircase of pitch pine, with Baywood newels and handrail.

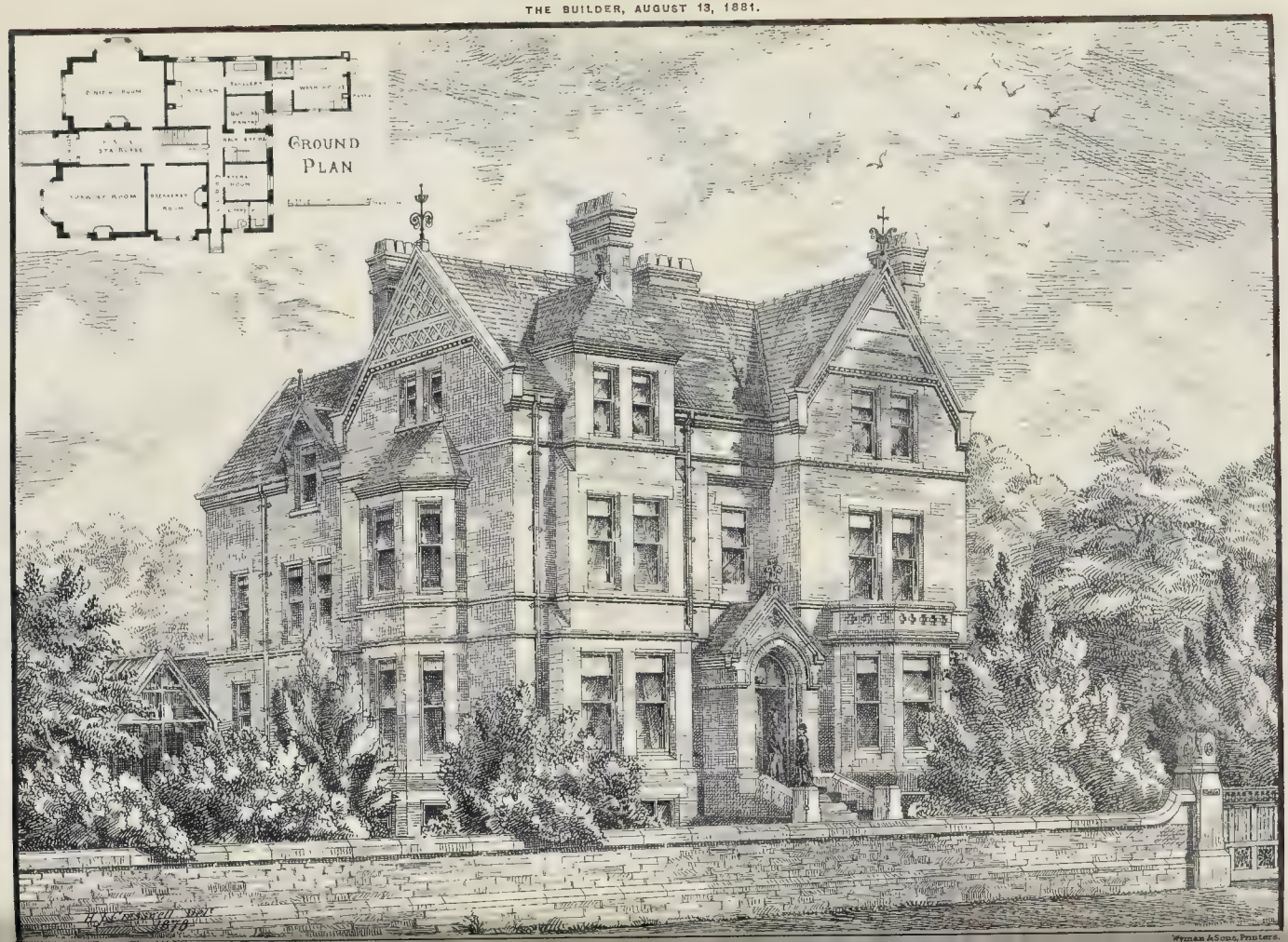
Mr. Thomas Newby, of Manchester, was the architect; and Messrs. T. & W. Meadows, of Heaton Norris, Stockport, were the builders.

PEVERIL HOTEL, THORPE, NEAR ASHBOURNE.

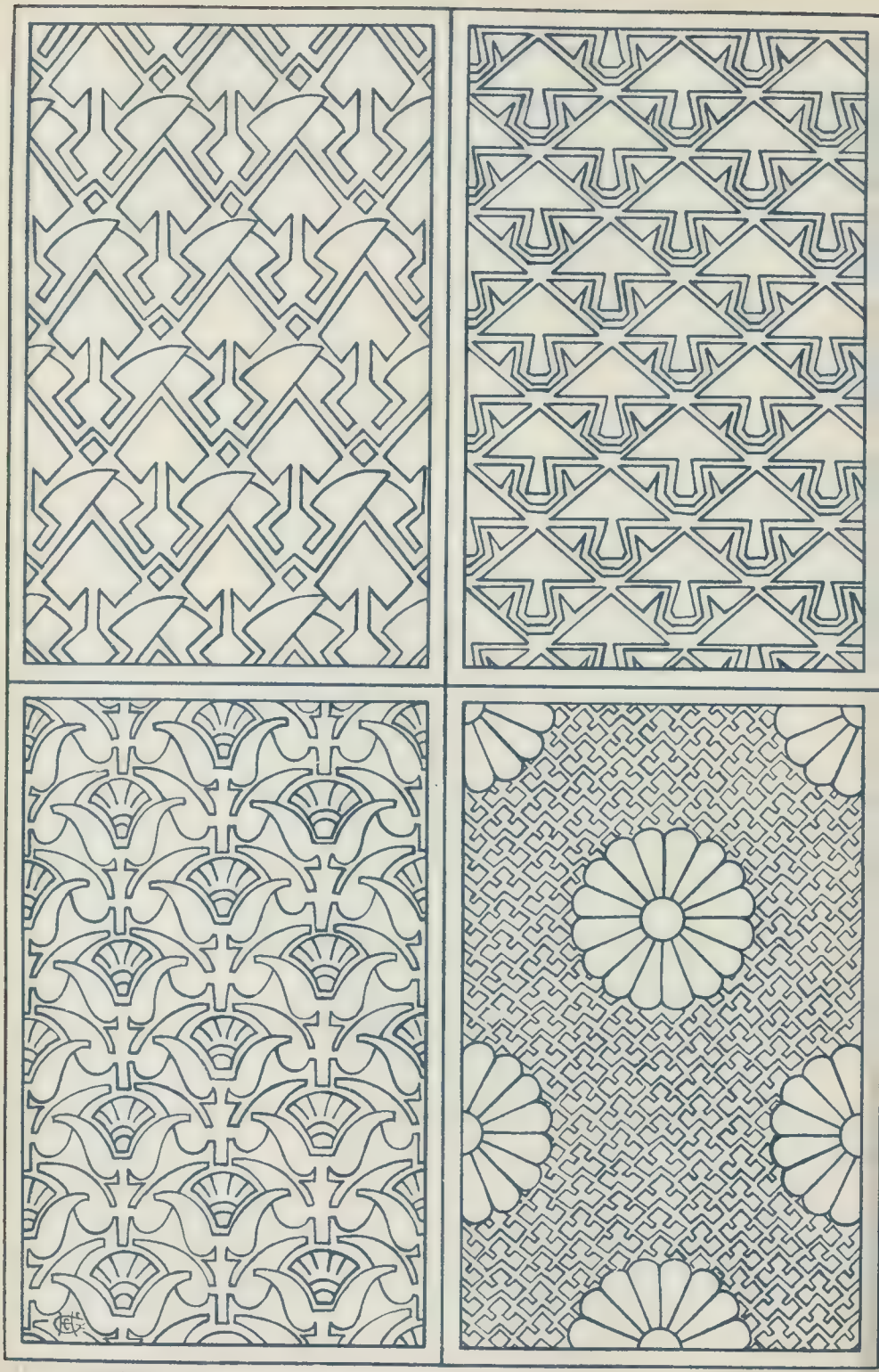
This hotel, belonging to Mr. Sydney Evershed, of Barton-on-Trent, is situate at the entrance to Dove Dale, Derbyshire, one of the most charming places in England. The whole of the half-timbered portion of the building is new, and constructed in wrought framing, the panels being of white fire-bricks from Pot Shrigley, near Macclesfield. These additions have been made to afford the increased accommodation required for the numerous visitors to the Dale, and include the ordinary rooms for casual visitors and rooms for dining for excursion parties, besides additional bedrooms, &c. on the upper floors. The buildings to the right of the hotel include extensive stabling and coach-houses.

The works have been carried out by Mr. Wm. Brown, builder, Manchester; the laying out and planting by Mr. Godwin, of Ashbourne; under the supervision of Mr. T. Waddingham, architect, Manchester, at a cost of about 2,000*l.*

Lanhydrock House, the Cornish residence of Lord Robartes, which was burnt down recently, is to be rebuilt on the old site, and in the old style, at a cost of 40,000*l.* Mr. Richard Coad is the architect.



Wyman & Sons, Printers.



DIAPERS FOR TERRA-COTTA.—By George Chas. Haite.

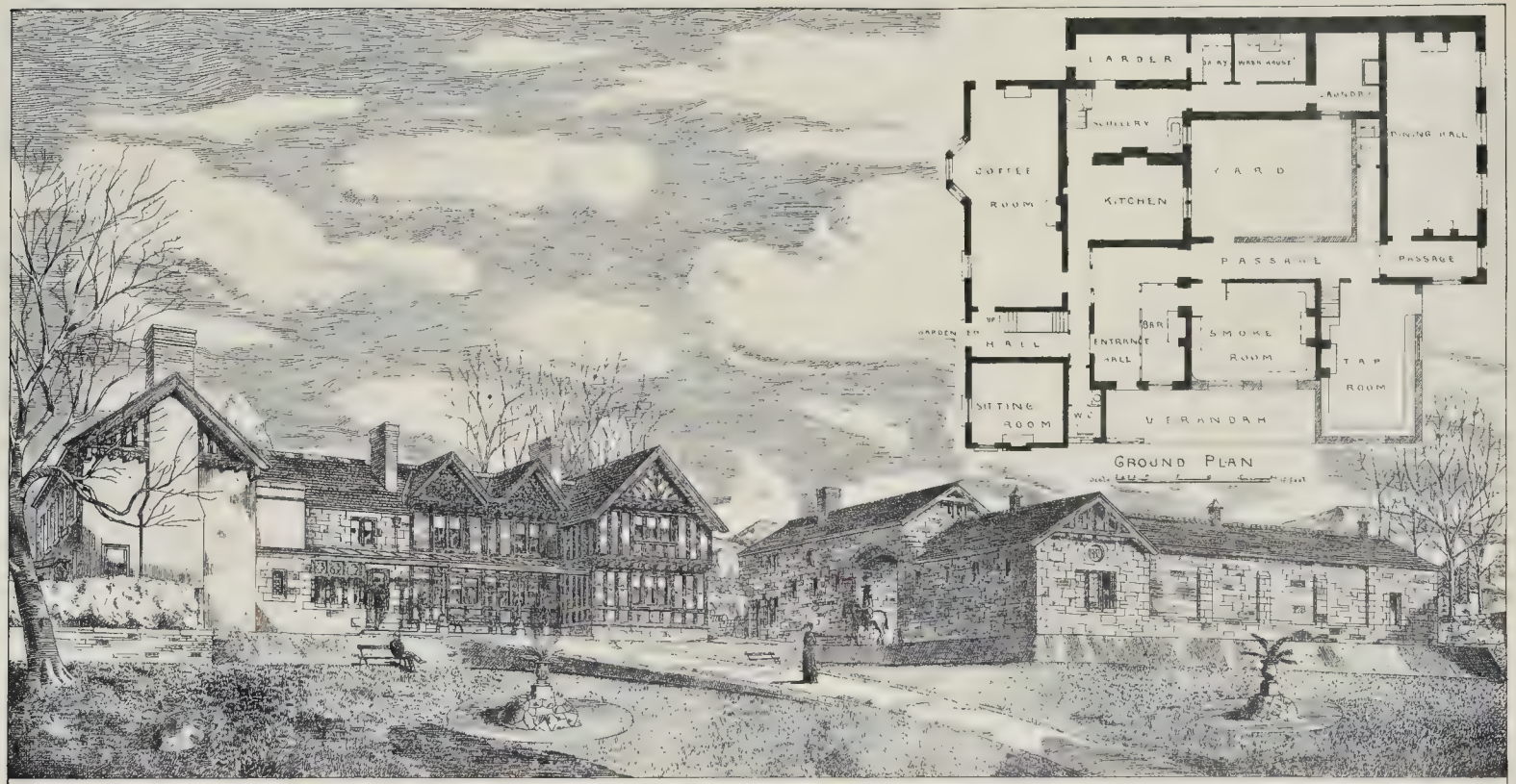




LEON CATHEDRAL, SPAIN: PRINCIPAL PORTAL.



TILES.—BY GEORGE CHAS. HAITE.



THE PEVERIL HOTEL. DOVEDALE, DERBYSHIRE.

THOS. WORSNOP, ARCHITECT, BRIDGE ST. MANCHESTER

Whiteman & Bass Photo-lith: 236 High Holborn

Wyman & Sons Printers 74 Queen St.

SAVAGE ARCHITECTURE.*

The habitations of the people of the Soudan were found by Mr. Petherick to consist, without exception, of round conical huts called tukkel, made of a slender framework of poles, tied together with strips of bark, covered with reeds. They are easily constructed, and afford capital shelter from wind and rain, the heaviest gales blowing harmlessly over them. "It often struck me," says Mr. Petherick, "that for temporary purposes, as during fishing or shooting excursions in secluded localities, or to provide shelter for shepherds on distant moors or hills, they might be of service to any country. In the centre of the spot selected, a peg is driven into the ground, to which a cord half the length of the intended diameter of the hut is attached; this drawn round, marks a circle, and indicates the outline of its base. Holes about 1 ft. deep are then dug with a pointed stick, at distances of a yard from each other, on the line marked out; into these, stakes about the thickness of a man's arm are driven perpendicularly. The top of each stake is forked for the purpose of receiving a bundle of reeds or rods, like slender pea-sticks, which, lashed firmly together with strips of bark, form a circle at an elevation of generally 3 ft. or 4 ft. from the ground. Two poles, about a yard longer than the diameter of the hut, are then attached together with rushes or bark at one extremity, to open and close like a pair of compasses; the pointed ends when raised are thrust into the circle of the rods, and another pair of poles similarly tied together being fixed transversely to them at right angles, the foundation, if I may so express myself, of the roof is formed. A smaller circle of reeds, like a hoop in shape, is then attached underneath the poles near their extremities, about 2 ft. 6 in. in diameter, in order to secure them, and another similarly-formed circle, placed half-way between it and the larger one on the stakes, forms a good support for the rafters of the roof, each of which being pointed, is driven into the reeds which support the whole fabric. At regular distances from the base to the top slender reeds are attached, with bark or rushes, to the outside of the rafters to support the thatch, and thus the hut at this stage is constructed like a cage, without the employment of auger, hammer, or nail. The thatch, formed of the long reeds of the millet, is then put on, and the sides underneath being covered with the same material, leaving a small aperture to serve for door, window, and chimney, the hut is finished, not having cost the owner one para (the fortieth part of a piastre) for either material or construction. The reeds at the top of the conical roof are bound tightly together so as to prevent the rain from percolating through them, and, cut off square, form a finish to the hut, on which the storks are permitted to build their nests. Others to prevent them place a stick ornamented with ostrich eggs perpendicularly in the centre of the projection, the uppermost eggs being generally surrounded by ostrich feathers. The generality of the huts used as dwelling-houses are finished with a flat-roofed shed of some 12 ft. square immediately in front of them, which in the dry season forms the usual sitting-room. If the family is large, or more space is desired, the shed is constructed in an oblong form to the length required. It has a spacious doorway in front, through which light is admitted in sufficient abundance to dispense with windows, and is never closed when any of the family are at home. When they are absent, a piece of wicker-work is placed against it, and sustained in its position by a piece of wood, serves to keep out dogs, fowls, and cattle, and being a sufficient indication that the inmates are absent, no one will approach it. Locks are dispensed with, and as housebreaking is unknown, they are not required. The furniture of the shed consists of two or more "angeriba" of home manufacture. In a corner is the 'murakka,' a crude stone on which, with plenty of elbow-grease, they grind their corn. The opposite corner is furnished with a couple of large earthen pitchers containing water. Attached to the roof are rough baskets of cotton, several gourds used as drinking-vessels, and an empty water-skin or two reserved for the use of the family whilst labouring in the cornfields. At night this shed is the sleeping apartment of the elder children, whilst the hut is occupied by the man, wife, and infant, if they have one. Their bed is a mat on a large couch in the centre of the hut under a canopy, and completely enveloped by fixed curtains made of various coloured matting; the only access to it being through a small aperture left in one side. The hut is also the storeroom for the good-wife's crockery, which is suspended in strings to the roof; and a thousand other household necessaries are distributed with equal care and ingenuity in its interior."

The dwellings of the savage inhabitants of Southern Africa are described as wretched affairs; those of the Damaras especially. The women are the builders. They first cut a number of sticks 8 ft. or 9 ft. long, and also strip off quantities of bark from the trees, which they shred and use as string; holes are then "crowed," or dug with pointed sticks, in a circle of 8 ft. or 10 ft. across, in which the sticks are planted upright; their tops are next bent together and lashed with the bark shreds; this makes the framework; round about it brushwood is woven and tied, until the whole assumes a compact surface; a hole for a door 3 ft. by 2 ft. is left in one side, and a forked prop is placed in the middle of the hut to support the roof; the whole is then daubed and plastered over, and the work is completed. As the roof becomes dried and cracked with the heat of the fire, and, indeed, as it generally has a hole in it for a chimney, the Damaras lay ox-hides upon its top, weighting them with stones that they may not be blown off; these they draw aside when they want ventilation, but pull them over at night when they wish to make all snug. The furniture of the hut consists of a couple of ox-hides for lying and sitting on, three or four wooden vessels, a clay cooking-pot, a bag of pig-nuts, a leather box containing a little finery, such as red iron earth to colour themselves with, and a small skin of grease. There may, perhaps, be an iron knife and a wood chopper; everything else is worn on the person, or buried secretly under the ground. When they sleep the whole population of the hut lie huddled up together like pigs, and in every imaginable position round the small fire. They have nothing to cover themselves with.

In Caffre-land, the huts, which have the form of a hemisphere, are from 18 ft. to 20 ft. in diameter, and from 6 ft. to 7 ft. high; they are generally built by the women, poles being first stuck into the earth, from which flexible boughs are arched over the top. This bower-shaped wattle-work is thatched with straw, and plastered over with clay and cow-dung. A small aperture is left for the door, which is formed of basket-work and usually screened by a rustic sort of portal. The fireplace is formed in the centre, and the only outlet for the smoke is the doorway; to this may be attributed in a great measure the circumstance of the inmates of these rude dwellings being so frequently afflicted with weak or sore eyes. The floor is usually composed of the earth of ant-hills, which, by long exposure to the heat of the sun, has become dry and hardened, being thus well adapted for the purpose, and producing a smooth and even surface. A few mats to sit and sleep on, a small one to hold the food when dressed, a few coarse earthen pots of native manufacture for cooking, a basket of peculiar workmanship so closely woven as to be capable of containing liquor, and a bundle of assegais or spears, constitute the furniture of a Caffre hut. In that of a wealthy Caffre there is usually a milk sack made of bullock's hide, so closely sewn together as to prevent leakage, and capable of containing several gallons; but the poorer classes are content to keep their milk in calabashes. The food of these people varies with the seasons; their principal support is milk and a coarse description of unleavened bread made from a kind of millet called Caffre corn, roughly ground between two stones. Meat is only eaten on great occasions, such as marriages and other festivals, or when they are obliged to kill an ox for the support of their wives while engaged in the duties of cultivating the land and suckling an infant; or at the time when karrosses are required for the use of the family, which seldom happens more than once a year, and among the poorer classes not so frequently. They never eat salt, to which they have a decided aversion. The milk is poured into a leathern sack, as before described, which being placed in the sun, soon curdles; a mess of this, with a little Caffre corn, either boiled or roasted, is in their estimation a most delicious banquet. They preserve their corn in holes dug for the purpose, in the centre of their cattle kraal, covering it with manure, which, being trodden down and well hardened, generally protects it from the wet, and here they consider it as being more safe from the attacks of the marauders. Should it prove occasionally rather musty, it is considered by no means unpalatable, but, on the contrary, possesses a flavour agreeable to their taste. Before they sit down to eat in company, the Caffres are very careful to immerse their hands in cow-dung, wiping them on the grass, which is considered the perfection of cleanliness. Except an occasional plunge in the river, they never wash themselves; so the ordinary condition of their bodies may be very well imagined. On a fine day their karrosses are opened out in the sun and such specimens of insect life as show themselves meet speedy destruction. It often happens that one Caffre performs for another the kind office of collecting these insects, in which case he preserves the entomological specimens, carefully delivering them to the person to whom they appertained, supposing, according to their theory, that as they derived their support from the blood of the man from whom they were taken, should they be killed by another the blood of his neighbour would be in his possession, thus placing him under supernatural influence.

At Whydah, in Western Africa, the king alone enjoys the privilege of dwelling in a house of more than one story; and we are told that the tyrant Bossa Ahadee, desirous of letting the whole world see how much he honoured one of his favourite generals, actually gave him leave to build a house two stories high. The buildings are composed of posts as thick as a man's thigh, one placed at each of the four corners, and sunk into the ground about 1 ft. 6 in.; other smaller ones are placed between at the distance of about 2 ft., and the intermediate spaces are filled up by plaiting with twigs and wattles. The walls, which are about 6 ft. high, are plastered inside and outside with clay, which is left to harden in the sun; but to prevent their drying too quickly and cracking, they are frequently moistened with water, and allowed to stand for several days or weeks exposed, before the roof is put on. It is seldom that the house consists of more than one apartment, but sometimes it is divided by a partition of wattles plastered with clay, reaching, however, only as high as the outside walls. Sometimes a kind of ceiling is made to the apartments, consisting of small spars of bamboo laid very close to each other, scarcely strong enough to walk upon, and intended only as a store-room to preserve their goods, &c.; but in general the space from the top of the walls upwards is left open. For the sake of coolness, also, they leave the space of 1 ft. open between the upper part of the wall and the roof. The roof, which is of thatch composed of the branches of a species of bamboo, or of long grass, is generally of a conical form, which gives the town, at a small distance, the appearance of a collection of small hay-stacks. The roof, by projecting a few feet beyond the outer walls, forms a kind of piazza, which affords shelter from the rain; and here, in the dry season, the people spend much of their time, either swinging in hammocks, or reclined upon mats spread on a bank of earth raised about 1 ft. 6 in. high, and 2 ft. or 3 ft. broad, which runs round the outside of the house, except at the entrance. The houses have seldom any other openings than the doors, of which there are usually two, opposite to each other, and serving the purpose of keeping up a current of air; they also admit the light, and afford an exit to the smoke of the fire, which is made on the middle of the floor. The entrance of a house is seldom closed by anything but a mat, which is occasionally let down, and is a sufficient barrier against all intruders. The Africans are not much burthened with household furniture,—a few mats to sleep on, and cloths to guard them from the cold at night, an iron pot, a few calabashes, a copper kettle for water, a basket, with a small box for the women's clothes, constitute the chief part of it.

On the banks of the Upper Binne, in this same quarter of the globe, Bakie, the traveller, discovered a colony of savages whose architecture more closely resembled that of the beavers than any of the human species. "We advanced right into the middle of the village and found no resting-place; right and left, before and behind, all was water. People came out of the huts to gaze at the apparition, and standing at the doors of their abodes were, without the smallest exaggeration, immersed nearly to their knees, and one child I particularly observed up to its waist. How the interiors of the huts of these amphibious creatures were constructed I cannot

* See p. 153, *ante*.

conjecture, but we saw dwellings which, if inhabited, the natives must have dived like beavers to get outside. We pulled in speechless amazement through this city of waters, wondering greatly that human beings could exist under such conditions. We had heard of wild tribes living in caverns and among rocks. We had read of races in Hindostan roosting in trees, of whole families in China spending their lives on rafts and in boats on their rivers and canals. We knew, too, of Tuariks and Shanbah roaming over vast sandy deserts, and of Eskimo burrowing in snow retreats, but never had we witnessed or even dreamt of such a spectacle as that of creatures, endowed like ourselves, living by choice like a colony of beavers, or after the fashion of the hippopotami and crocodiles of the neighbouring swamps. A little distance from us we espied a large tree, round the foot of which was a patch of dry land, towards which we pulled, but grounding before reaching quite to it, Mr. May and I waded to it, instruments in hand, to take observations. We were barely allowed to conclude when nearly the whole population of the place, half wading, half swimming across a small creek, came upon us and stared at us in wild amazement. A hurried set of sights being taken, we carried our things back again into the boat, and as we wished to get another set about three quarters of an hour after noon, we tried to amuse ourselves and to spend the intervening time as best we could. We were now able to look a little more attentively at our new friends, who in large numbers crowded round, and who, male and female, were nearly all equally destitute of a vestige of clothing. One young man understood a few words of Hansa, and by his means we learnt that this was Dulto, of which we had heard at Djin, and that the inhabitants were of the same stock as at the other villages; but they were by far more rude, more savage, and more naked than any of the other Barbai whom we had encountered. A canoe came near us, lying in the bottom of which was a curious large fish, of which I had just time to make a rough eye-sketch, when I had to retreat to the boat; and Mr. May, who had been exploring in another direction, also returned. The behaviour of these wild people now attracted our notice. The men began to draw closer around us, to exhibit their arms, and to send away the women and children. Their attentions became momentarily more and more familiar, and they plainly evidenced a desire to seize and plunder our boat. A sour-looking old gentleman, who was squatting on the branch of a tree, was mentioned as their king; but if so, he made no endeavour to restrain the cupidity of his *sans culottes*. Part of a red shirt, belonging to one of our Krumen, was seen peeping out from below a bag, and some advanced to lay hold of it, when suddenly my little dog, who had been lying quietly in the stern-sheets, raised her head to see what was causing such a commotion. The sudden appearance startled the Dulto warriors, who had never seen such an animal before, so they drew back, to take counsel together, making signs to me to know if she could bite, to which I replied in the affirmative. Matters were beginning to look serious. Our crew, as usual, were timid, and Mr. May and I had only ourselves to depend upon in the midst of 300 or 400 armed savages, who were now preparing to make a rush at us. There was no help for it; we had to abandon all hope of our remaining observations, and of so fixing an exact geographical position. As at Djin, I seized a few trinkets, and handing them hastily to those nearest us, we shoved off while the people were examining those wondrous treasures."

From Western Africa to Eastern, and there we find the dwelling-house assumes its normal African form,—the circular hut described by every traveller in the interior, and especially by Capt. Burton, to whose account of the architecture of Eastern Africa we are, in the following descriptions, much indebted. Dr. Livingstone appeared to judge rightly that its circularity is the result of a barbarous deficiency in inventiveness. It has, however, several varieties. The simplest is a loose thatch, thrown upon a cone of sticks, fixed in the ground, and lashed together at the apex. It ignores windows, and the door is a low hole in the side. A superior kind is made after the manner of our ancient bee-hives. It is cup-shaped, with bulging sides, and covered with neat thatch cut in circles, which overlap one another tile fashion. At a distance it resembles an inverted bird's-nest. The common shape is a cylindrical framework of tall staves or the rough trunks of young trees planted in the earth, neatly interwoven with parallel and concentric rings of flexible twigs and withes. This is plastered inside and outside with a hard coat of red or grey mud. In the poorer tenements the surface is rough and chinked; in the better order it is carefully smoothed, and sometimes adorned with rude imitations of life. The diameter averages from 20 ft. to 25 ft., and the height from 7 ft. to 15 ft. in the centre, which is supported by a strong roof-tree, to which all the stacked rafters and poles converge. The roof is subsequently added: it is a structure similar to the wall interwoven with sticks, upon which palm-fronds are thrown, and the whole is covered with thatch tied on by strips of tree-bark. It has eaves which, projecting from 2 ft. to 6 ft.,—under which the inhabitants love to sit and shade themselves,—rest upon horizontal bars, which are here and there held by forked uprights, trees rudely barked. Near the coast, the eaves are broad and high; in the interior, they are purposely made so low that a man must creep in on all fours. The doorway resembled the entrance to an English pig-sty; it serves, however, to keep out the heat in a hot season, and to keep in smoke and warmth during the rains and the cold weather. The threshold is garnished with a horizontal log or board that defends the interior from inundation. The door is a square of reeds fastened together by bark or cord, and planted upright. In the colder and damper regions, there is a second wall and roof outside, the first forming, in fact, one house within the other. Westward of Unyamwezi in Uvinza, and about the Tanganyika Lake, the round hovel again finds favour with the people, but even there the Arabs prefer to build for themselves the more solid and comfortable tembe. The tembe wants but the addition of whitewash to make it an effective feature in African scenery; as it is, it appears from afar like a short line of raised earth. The form is a hollow square or oblong, generally irregular, with curved projections and semi-circles; in the East African Ghauts the shape is sometimes round or oval to suit the exigencies of the hill sides and the dwarf cones upon which it is built. On the mountains and in Ugogo, where timber is scarce, the houses, from the continued frontage of the building, which is composed of mimosa trunks, stout stakes, and wattle and dab, rarely exceed 7 ft. in height. In the southern regions of Usagara, where the tembe is poorest, the walls are of clods loosely put together and roofed over with a little straw. About Mesene, where fine trees abound, the tembe is surrounded by a separate palisade of young unbarked trunks, short or tall, and capped here and there with cattle skulls, blocks of wood, grass wisps, and similar talismans; this stockade in damper places is hedged with a high thick fence, sometimes doubled and trebled, of pea-green milk-bush, which looks pretty and refreshing, and is ditched outside with a deep trench serving as a drain. The cleared space in front of the main passage through the hedges is often decorated with a dozen poles placed in a wide semicircle to support human skulls, the mortal remains of ill-conducted Boers. In some villages the principal entrance is approached by long, dark, and narrow lanes of palisading. When the settlement is built purely for defence it is called Kaya, and its head-men Muinyi Kaya; the word, however, is sometimes used for Boma or My, a palisaded village in general. In some parts of Unyamwezi there is a Bandani or exterior booth, where the men work at the forge or sit in the shade, and where the women husk, pound, and prepare their grain for cooking.

The general roof of the tembe is composed of mud and clay heaped upon grass thickly strewn over a framework of rafters, supported by the long walls. It has usually an obtuse slope to the front of another at the rear, that rain may not lie; it is, however, flat enough to support the bark-bins of grain, gourds, old pots, firewood, water-melons, pumpkins, manaioc, mushrooms, and other articles placed there to ripen or dry in the sun. It has no projecting eaves, and it is ascended from the inside by the primitive ladder, the inclined trunk of the tree, with steps formed by the stumps of lopped boughs. In each external side of the square one or two doorways are pierced, which are large enough to admit a cow. They are jealously closed at sunset, after which hour not a villager dares to stir from his home till morning. The outer doors are sometimes solid planks; more often they are three or four heavy beams suspended to a cross-bar passing through their tops. When the way is to be opened they are raised from below, and are kept up by being planted on a forked tree-trunk inside the palisade; they are let down when the entrance is to be closed, and are barred across with strong poles. In Unyamwezi the centre is sometimes occupied by the Iwanza, or village "public-house." Of these buildings there are generally two in every settlement, built at opposite sides, fronting the normal Mremba-tree, which sheds its filmy shade over the public court-yard. That of the women is a species of harem, it is very seldom visited; as travellers and strangers are always admitted into the male. Iwanza it is more readily described. This public-house is a large hut, somewhat more substantial than those adjoining, often smeared with smooth clay, and decorated here and there with broad columns of the ovals before described, and the prints of palms dipped in ashes and placed flat, like the hands in ancient Egyptian buildings. The roof is generally a thatch raised a foot above the walls, an excellent plan for ventilation in these regions. Outside the Iwanza is defended against the incursions of cattle by roughly-barked trunks of trees resting upon stout uprights; in this place the men sit, converse, and smoke. The two doorways are protected by rude charms suspended from the lintel,—hares' tails, zebras' manes, goats' horns, and other articles of prophylactic virtue. Inside, half the depth is appropriated to the Ubiri, a huge standing bedframe, formed like the plank-benches of a civilised guardroom, by sleepers lying upon horizontal cross-bars; these are supported by forked trunks, about 2 ft. long, planted firmly in the ground. The floor is of stamped earth. The furniture of the Iwanza consists of a hearth and grinding-stone; spears, sticks, arrows, and shillelahs, are stuck to smoke in the dingy rafter-ceiling, or are laid upon hooks of crooked wood depending from the sooty cross-beams; the corners are occupied by elephant-spears, and similar articles. In this public-house the villagers spend their days, and often, even though married, their nights, gambling, eating, drinking pombe, smoking bhang and tobacco, chatting and sleeping, like a litter of puppies, destitute of clothing, and using one another's backs, breasts, and stomachs, as pillows. The Iwanza appears peculiar to Unyamwezi.

The Red Indians are not wanderers by nature but rather from necessity; most of them live in tents made of buffalo-skins, or the bark of trees which are as picturesque as they are original. These tents are generally of the shape of a reversed funnel; the opening at the top serves at once as a window to admit light and air, and as an egress for smoke. The door, which does not close, is low and narrow. These tents are generally very spacious, of an average 20 ft. in height by 30 ft. or 40 ft. in width; with rare exceptions they are very clean in the interior. The Indians have, like Europeans, some idea of comfort and even elegance in their dwellings. Among some tribes, especially the Crows, the Blackfeet Indians, and the Comanches, the skins destined to cover the tents are prepared with as much care as those employed for making tunics or mocassins. Some of these skins prepared by the Comanches are very soft to the touch, and brilliantly white inside; many were even ornamented with designs in coloured marquetry, representing sometimes a buffalo hunt, sometimes groups of arms and shields, arranged with great art. The tents are generally only provisional dwellings, constructed for the duration of a halt or of a season at most. When a tribe becomes stationary, or at least intends to remain a long time in the same country, it builds small habitations of a more solid description, which afford better protection against the inclement of the season. In the north-west of America the Indians build huts of the trunks of trees for the winter, like those the Americans call log-houses. They are constructed of blocks of wood cut square, placed side by side, and joined together by a mortice at both extremities. The cabins are of an oblong shape, and the door is narrow, low, and on a level with the ground, so that it is often necessary to kneel down to pass into the interior; a thatched roof completes this rude and primitive dwelling.

The Shoshones, above all those who live in the midst of the mountains of Utah, inhabit caverns in the rocks. The Chinook build their houses of thick and broad planks, which they prepare with great trouble out of the trunks of large fir-trees, which grow in great abundance in their country. The houses are oblong, and two rows of beds ranged one over the other,

like berths in a ship,—are placed against the wall.

In Oregon, the habitations of the Indians are generally mere huts, six or ten yards long, conical in shape, and crossed in the interior by beams, which are used for drying salmon. The Indian huts on the banks of the Columbia are for the most part constructed of the bark of trees, pine branches, and brambles, which are sometimes covered with skins or rags, and have a very squalid appearance. Round about are scattered in profusion the bones of animals, the refuse of fish, and heaps of dirt of every description. In the interior roots are piled up in heaps, skins and dried salmon are suspended from poles, and round the wicker cauldron crouch human beings of the most repulsive aspect, their faces covered with grease and dirt, their hands and whole persons disgustingly dirty.

The houses of the Pawnees are circular, and generally about fifty yards in circumference. They are formed of young trees planted at regular distances, whose summits, bent inwards, rest on an equal number of posts driven circularly into the ground. This framework is covered with the bark of trees, earth, and green herbs, which give these cabins the appearance of natural hillocks of grass, or of gigantic beehives. Light and smoke pass through openings in the centre of the roofs of these rustic dwellings, which are warm in winter, and very cool and comfortable in summer.

The Indian habitations, says the Abbé Dominech, who furnishes us with these particulars, are about as various as the tribes, each being distinguished from the others by its form, material, and style of construction. Thus, the cabins of the Omahas, which are circular, like those of many other tribes, have this peculiarity, that they are decorated in bright colours of a beautiful effect,—a fashion not adopted by the neighbouring tribes. The dwellings of the Hamaths have only an opening at the summit, which serves at once as door, window, and chimney. The Natchez used to build themselves solid houses five yards square, of a kind of mortar composed of wood, mud, sand, and moss, called by the Creoles "barbe-espagnole." The roof, made of reeds and grass, often lasts twenty years without needing repair. A very low and narrow door, like that seen in the pueblos of New Mexico, was the only opening in the house.

Most of the Comanches, like the Sioux of the Missouri, have dwellings which are in no way comparable to those of the Mandans. Their hut is the traditional wigwam, which can be set up easily at every halt, and then carried away a considerable distance. Its shape is always that of a reversed funnel, and it is made of buffalo skins or birch bark. It is never very large; provided there is sleeping-room for every member of the family, nothing more is needed, the rest of their time being passed in the open air.

The Needle-Hearts and several tribes of Columbia generally make their tents of mattings of reeds, stuck into the ground, and raised in the middle on a slight timber-work. In the south of Upper California, New Mexico, and Utah, and on the banks of the Gila and the Colorado, some populations are met with who inhabit great cylinders of birch bark, or of reed matting.

The Navajos live for the most part in cuneiform huts, not unlike those of the Pawnees. Some are of bricks baked in the sun, others are made of the branches of trees, or of reeds covered with mud, but very pretty in appearance. They are generally scattered among fine fields of maize, or beautiful orchards of fruit-trees. The Indians remain very little within their wigwams. The principal work of the women, the preparation of skins, is always done in the open air; the men are generally out hunting or fighting, and when they return to the villages, they smoke and talk in groups on the grass of the fields, and only enter their dwellings to eat or sleep. Winter alone forces them to shut themselves up in their frail habitations, which protect them but imperfectly from the severity of the weather, and yet deprives them of the pleasure of contemplating external nature, for which they have a real passion, even when the elements are convulsed, and seem to threaten everything with destruction.

The cabins of the Mandans are made of wood covered with clay, which acquire, by exposure to the sun, a solidity almost equal to that of stone. They are of the shape of a flattened cone; the ground being hollowed out to serve as floor and foundation; there are generally two or three steps to descend on entering. The roof, made of a solid framework of wood, intermingled with branches of trees and covered with clay, forms, notwithstanding its inclination, an agreeable and convenient terrace, where the Mandans often resort to smoke and converse in the evening, and where in summer they often sleep. The interior of these round huts is about 50 ft. in diameter. The walls are constructed of enormous beams a foot thick, the first row of which is solidly fixed in the ground, and serves as a foundation, rising in a circle 5 ft. or 6 ft. above the surface of the soil; a second row rests at one end on the first, and at the others leans against a third which forms the roof, and which is supported by transverse beams and perpendicular pillars rising from the ground. This woodwork is covered externally with a layer 8 in. or 10 in. thick of willow branches to prevent the wood from becoming penetrated with damp and growing rotten. These half-subterraneous dwellings only receive light and air through an opening 10 ft. or 12 ft. in circumference at the summit of the building. The hearth, which serves as a kitchen, is hollowed out in the ground immediately below the opening, and is sufficiently well constructed to resist the action of the fire. It is generally about a yard in width, but sometimes, when a family becomes numerous, it is increased in size, so that every one may find a place in the circle of which the hearth becomes the centre in winter. The beds are placed against the wall all round the cabin, as in our school dormitories. They are made of woven willow branches, and placed about 2 ft. from the ground on props; a buffalo skin freshly taken off the animal is laid over this matting, fur upwards, and as it dries adheres to the willow branches, and forms a tolerably soft mattress. Having little taste for the perpetual combats entailed by a wandering life, the people have grouped themselves for mutual protection and defence in fortified villages. The fortifications consist of a wall of trunks of trees, 15 ft. or 20 ft. in height, and firmly fixed in the ground; a small space is left between the trees for observing the enemy, and for the passage of the arrows showered on the assailants. Within this wall, which entirely surrounds the village, there is a ditch, in which the defenders of the place conceal themselves in order to discharge their arrows with more security.

A. T. Sibbald.

CRYSTAL PALACE ENGINEERING SCHOOL.

The twenty-sixth term of this school was closed on Saturday last, when, as usual, a large number of the parents and friends of the students and others interested in the school met in the south tower of the Crystal Palace, where the school premises are situated, to see the work of the students and to be present at the presentation of the certificates. The work of the students in the drawing-office and in the pattern and fitting shops was much admired; the out-door work of the students in the Colonial section excited special interest. There were sixty students in the school during the term, including eight in the Colonial section.

Mr. McGeorge, chairman of the Crystal Palace Company, was present, and took an active part in the proceedings. The certificates awarded to the successful students were presented by Mr. Alfred Giles, Memb. Council I.C.E.

The theoretical part of the students' instruction is communicated by lectures, delivered twice a week, by Mr. J. W. Wilson, the principal, with occasional additional lectures by Mr. J. W. Wilson, jun., his chief assistant, and special lectures by other gentlemen. The students are required to answer, in writing, about 400 questions relating to the lectures.

The lectures for the last term have been on "Railway and Dock Work." Thirty-one students attended the lectures; twenty-six were eligible for examination, and fourteen passed satisfactorily. Mr. H. Skinner was first, with 222 marks, and also first in order of merit in the fitting-shop; Mr. H. Sadler is second, with 219 marks, and first for drawing; Mr. W. T. C. Beckett has 215 marks, and is second for fitting; Mr. E. S. Tiddeman has 209 marks, and is first for pattern-making. The remaining ten students, who passed for lecture examination, had from 191 to 134 marks. Ten students had certificates for work in the drawing-office; seven for work in the pattern-shop; and ten for work in the fitting-shop.

In the Civil Engineering section (first term), for general surveying, preparations of plans, sections, &c., for Parliament, Mr. W. Martin was first, and Mr. A. Scratton, second. Second term, for calculation of strains and the preparation of general and working plans, specifications, and estimates of a railway and dock, Mr. A. E. Nichol, first; Mr. H. A. F. Smith, second. Third term, Mr. J. G. Gerds, first; Mr. W. H. Jordan, second.

Mr. Giles delivered an interesting practical address to the students, congratulating them upon the advantages they enjoyed in such a school. He was acquainted with several engineering schools, but in the efficiency and thoroughness of the training and instruction given, theoretical and practical, he knew of nothing superior, if anything equal, to this school. There were vast fields open for the engineer in the colonies and abroad, if not in this country. The Institution of Civil Engineers, which had existed for sixty-three years, had 1,100 members, and 800 associates; in seven years 400 engineers had gone out from it to fulfil professional duties, which was a very small contribution towards the demand for the works that awaited them. There was no royal road to distinction in engineering,—they could only achieve it by hard, persevering study and work, and by making the best use possible of their opportunities.

Messrs. A. D. Fox, M. Inst. C.E., and T. H. Blakesley, M.A., A.-M. Inst. C.E., were the examiners. They report their "high satisfaction with the method of the instruction pursued in the various departments."

Mr. Wilson, the principal, in acknowledging a vote of thanks, gave two illustrations of what students might do by making the most of their powers. One of them, who was almost entirely deaf and dumb, had done very meritorious work in the drawing-office, and had even been eligible for examination on lectures. Another, who had lost his right arm in a Mexican war, had also done remarkably well in the drawing-office. This student had been to Geneva since he had lost his arm, and from what he learned there was able to make excellent watches, and he carried a valuable chronometer of his own making.

The Colonial students, with Mr. West as captain, camped out for a fortnight before the close of the term, sleeping in tents, and doing their own cooking at a camp fire of their own construction. Their fireplace, of stone and clay, with a few iron bars, accommodated three cooking utensils at once. The cellar and pantry were in the hollow of the Megatherium, close to the camp. The outdoor work of the students consisted of the erection of two stout bridges over an arm of the lake; one of them a single-span spar-bridge, the other a floating bridge on barrels lashed together. Any one who witnessed the rough, ready, and rapid manner in which the tents were struck, the bridges taken to pieces, and the camp dismantled, would conclude that such young fellows are admirably fitted for camp or colonial life, and that they cannot fail to profit by their training and experience at the Crystal Palace School.

TRADES' GUILD OF LEARNING.

A public meeting in support of the objects of this society was held on Monday evening last in the Hall of the Society of Arts. The meeting was the outcome of a conference held at the house of the Earl of Rosebery about a month since, with the object of obtaining increased support from the public for the Trades' Guild of Learning, and reorganising it on a broader basis. At the conference referred to, it was strongly recommended that the Guild should undertake, as a regular part of its work, to provide lectures on the history of the higher branches of industry and the principles of art or science underlying them, in order to stimulate the desire for superior technical instruction, and to assist in filling the classes to be organised by the City and Guilds of London Institute and similar associations. The chair at the meeting on Monday last was taken by the Earl of Rosebery.

Professor G. C. Warr, one of the hon. secretaries, said that a number of letters of apology for inability to attend the meeting had been received, including one from Mr. Blanchard Jerrold, who suggested that an exhaustive review of French methods of technical education should

be drawn up. "We want in England," said the writer, "primary trade schools where the elements of science, skill, and taste shall be taught and spread over the country. The reason why French artisans excel in taste, ingenuity, and neatness of work is to be found in the elementary trade schools which are to be found everywhere in France." The Professor went on to give a brief sketch of the history and work of the Guild, which, he said, was calculated to do an immense amount of good to the workmen, not of London alone, but of the country generally. Some valuable lectures had been given under the auspices of the society, including those by Mr. William Morris on the principles of house decoration. It was, however, proposed to rely in future less on lectures than on systematic class teaching. To carry on this work the co-operation of the trade societies would, it was hoped, be secured.

The Earl of Rosebery said the objects of the meeting were to ascertain to what extent a desire existed amongst workmen for a continuation of the Guild; and secondly, to try and make known to a larger audience than they had yet appealed to the objects of the association. There were several technical schools now being built or established in London, and the first stone of one institution of the kind was laid a few days ago. In France, Germany, Italy, and other countries, such schools had existed for many years to the great advantage of the workmen living there, and to the injury of workmen here, in the matter of competition. The desire of the association was not so much to give instruction in actual handicrafts as to impart the theory, history, and principles of such craft. Such instruction would raise a craft in the estimation of its followers, who would obtain a higher conception of the importance and value of their work. No trade existed but had its history and theory. Without such knowledge of its history no craft would be interesting; nor would any institution be so. A great number of institutes existed for elevating and spiritualising all kinds of people, very often much against those people's will. There was but one really efficient basis for their guild, and that was the support of the working man himself. If it was to have any vitality it must be formed on the wishes and instructions of those for whom it was intended. If the Guild could not obtain the hearty co-operation of working men, he would be no party to its continued existence.

Mr. Thomas Burt, M.P., moved the following resolution:—

"That this meeting approves and pledges itself to support the objects proposed by the Trades Guild of Learning, viz.: (1) To provide lectures on the history and principles of various industries, with a view to encourage the desire for improved technical education; and (2) To continue the general education which the Guild has carried on for some time by means of lectures and classes."

The speaker enlarged on the importance and necessity of the work sought to be done by the Guild, and argued that it was the duty of all trade societies to help in the work. He did not want to see trade societies content to remain what they had been,—perhaps, to too great an extent,—in the past, viz., mere fighting institutions. He wanted to see them do more to improve the moral, intellectual, and social condition of the workman. That they could do much in that direction he showed by quoting what had been done by the Northumberland Miners' Associations in inducing the coal-hewers of that district to attend lectures on political economy. Many of the men walked several miles after working all day in the pits, to attend these lectures, which were given at three different centres, the average attendance at each centre being between 300 and 400. Out of about 1,000 persons who attended the lectures, fully nine-tenths of them passed the examinations which were subsequently held. Mr. Burt concluded by expressing his agreement with the chairman as to the necessity of the Guild being supported by the workmen themselves, if it were to be of any real service. Nothing would be done without the exercise of the virtue of self-help and self-reliance on the part of the workmen.

Mr. George Augustus Sala seconded the motion, observing that various remarks had been made as to what should be the attitude of the Guild with regard to the advancement of purely technical education, but he was rather disposed to think that, without interfering directly with any scheme of technical education, and without trenching on the operations of any other institution, it should be the aim of the guild to inculcate learning, — knowledge, — amongst workmen. Knowledge, it had been said, was power. He did not know that such was always the case, but this he did know, that knowledge was happiness, and the pursuit of happiness was one of the rights of man, as stated in one of the noblest pieces of prose that was ever written, viz, the American Declaration of Independence. The pursuit of knowledge would ever be the pursuit of happiness to all diligent seekers after it. True learning taught men to be humble, not with the humility of a Uriah Heep, but with a humility which the more they knew impressed them with the feeling that the sum of all their knowledge was but as the shadow of the shade of smoke, and that they were themselves but as infinitesimal grains of sand held in the hands of the Almighty. In conclusion, Mr. Sala spoke of the services rendered to the cause of popular education by Brougham, Grote, Dr. Birkbeck, and the Society for the Diffusion of Useful Knowledge.

The resolution was carried unanimously.

Mr. Hodgson Pratt moved the following resolution,—

"That the Trade Societies should be urged to co-operate as far as possible in organising the proposed lectures and classes; and that the Council should specially invite the support of the large employers of skilled labour in London."

The speaker referred to the great development which had taken place of late years in the matter of providing technical schools for artisans and apprentices among Continental nations, and quoted instances in which industries had left one country to return again when due attention was paid to technical instruction. After giving an exhaustive review of what had been done in this country of late years towards supplying defects in technical education,—incidentally remarking that much of the work of the Science and Art Department, well-intentioned though it was, had failed because the teachers of classes under the auspices of the Department were unable to practically exemplify the theories which they propounded,—the speaker referred to the Artisans' Institute, now about to be (as we lately reported) merged into the City and Guilds of London Institute, and concluded by saying that the Trades' Guild of Learning, if it were to succeed, must be supported by working men themselves, and carried on in deference to the views of workmen.

Mr. Phillips, in seconding the motion, expressed the opinion that the intention of the Guild to provide, besides technical classes and lectures, lectures on other subjects of interest to workmen, was a laudable one. No intelligent workman, for instance, could listen to a lecture on health and its conditions by such a man as Dr. Richardson without striving to better the home surroundings of himself and family. Again, lectures on Shakspearian and other subjects were heartily appreciated.

Mr. Alsager Hay Hill thought that all subjects other than those directly calculated to make the members better workmen would be best excluded from the programme of a trades' guild of learning. He wished to know whether the Guild would keep its doors open to all apprentices, and even to clerks and others who wished to learn a trade? If so, did the Guild expect to receive the co-operation of the trade societies, most of which strictly limited the number of apprentices allowed? Was the Guild prepared to examine workmen as to their efficiency and to grant certificates or diplomas of competency?

Mr. Thomas Paterson thought that the possession of such a certificate or diploma would be greatly esteemed by a workman.

Professor Ayrton said that such technological examinations as were referred to had been for some years past carried out in all parts of the country, at first by the Society of Arts, and latterly by the City and Guilds of London Institute. Replying to some criticisms as to the erection of the central institution of the City and Guilds Institute at South Kensington, the Professor pointed out that at Cowper-street, Finsbury, and in other parts of London, the Institute was, and had been for some time past, doing good work, and in the course of a few years they hoped to have an efficient technical school in every quarter of London.

The motion was carried, as was a vote of thanks to the Chairman, Lord Rosebery. This motion was supported by Mr. Hooper (who gave a very interesting account of what he, aided by one or two earnest friends, had done for technical education amongst carriage-builders), and by Mr. George Shipton, organising secretary.

Mr. E. Marjoribanks, M.P., who had taken the chair in succession to Lord Rosebery, briefly replied, and the meeting terminated at a late hour.

THE APPROACHING MEETING OF THE BRITISH ASSOCIATION.

A FEW MODEST SUGGESTIONS.

Not having a very agreeable recollection of the last meeting at Swansea, I venture to make a few suggestions for the meeting at York on the 30th inst., attention to which I am bold enough to think would greatly enhance the usual objects of the meeting, and contribute to the comfort of the members and visitors.

In the first place, I would suggest that the secretaries should make known the arrangements that have been made with the railway companies. I called at the Great Western Station last year, at five o'clock on the 23rd of August, and the clerk told me that they had no notice of the meeting. I took upon myself to tell the station-master that there would be a large accession of passengers for Swansea on the following morning, and that he had better provide extra carriages. He received this notice gratefully, and in the morning the additional carriages being ready prevented much confusion. It is true that on the morning of the 24th the ticket-clerks were aware that an allowance was to be made to the members visiting the meeting, but the majority of those who were going did not, and I believe that not more than a third availed themselves of the privilege liberally accorded by the railway company. One inference from this is that, if it had been made widely known, more persons would probably have joined the meeting.

The next and most important hint that I venture to give is to the president and those who read papers, that if they wish to instruct, to broach a theory, or to maintain an opinion, it is necessary that they should be heard. I have the highest possible respect for Professor Ramsey, for example, but the following will illustrate what his address was to me and others who sat about the centre of the hall:—

"It is unnecessary for my present purpose to enter into details connected with the recurrence of marine formations, since all geologists know that the greater part of the stratified rocks were deposited [*then putting his face close down to his notes*] in the s— as pro——."

All or nearly stratified formations have been in a sense metamorphosed, since, excepting certain limestones, the fact of loose incoherent sediments having been by pressure and other [*face down*] tur in sol——."

These paragraphs may be found in full a page 2 of the published address. It would occupy too much space to illustrate the twenty-two pages. It may be said that one can read the papers and addresses afterwards; but then one had better stay at home and do so quietly. I would venture to add that the papers read should not bear the evidence of haste. It is a prone thing, perhaps, to be a ready writer; but the fact of boasting that a paper was written in an hour leaves too often only the evidence of an invertebrate production, slovenly and incomplete, or in bad manuscript which the author himself has difficulty in reading.

How different was the case with Sir Richard Temple and his paper on the railway to Candahar. It is said that he rehearsed it in private with his brother, who made its exquisite illustrations; and the consequence was that there was not a single word lost, not a hitch in the narrative, or a delay in finding the drawing to which allusion was being made.

Then, to those who take part in any discussion that ensues, I would humbly suggest that it is the audience and not the diagram that has to be convinced. At the last meeting I had a dozen experiences of men seizing a piece of chalk and with their backs to the audience, holding a long and animated, but inaudible, conversation with the black board, which I hope was converted to the views of the objector, but of this I can give no opinion, not having been taken into the confidence.

I next venture to suggest that the local committee should intercede with the Dean of York to allow the cathedral to be seen without the intervention of an illiterate verger. A sum should be charged to the members and visitors to compound for the sixpence a head.

The following is a portion of what I heard on the 28th of July last. After the morning service we were all gathered together that we

night insert our names in a book and pay the sixpences. We were then taken into the choir, and heard a long dissertation on Martin and his firing the church. "I can recollect it," quoth the verger, "so you see I am no chicken." Coming out into the south aisle he points to the gates and says, "The minster is dedicated to St. Peter. The keys on the gate is the emblem of St. Peter; they are 400 years old." And so on till we came to a monument that had this importance: "Where they lived is now occupied by Sir George Wombwell." We were subsequently taken into the crypt, where we heard the following:—"I am now going to show you the first Saxon church. Now there's not one in twenty among you that knows what Saxon architecture is, I lay!" I expected a disquisition on long-and-short work, but it ended in,—"Well, it is what is called herring-bone. You see those stones,—the way they are put. I hope you will recollect all that I have told you, or else I have wasted my breath." We then marched to what he said was the finest of all. Then opening a door he pointed out that this was the *veste bull* of the chapter-house. "It is in the chapter-house," said he, "that Convocation is held. There's not many here, I dare say, who knows what convocation is. There's only two Convocations," and so on. This after Willis's production of 1846, and those who preceded and followed him in illustrating the architecture and history of this grand old edifice.

The names in the book before mine were of several visitors from Massachusetts. Would the swaddle I have quoted remind them of the author who was born in that state, and who said, "A Gothic cathedral is surely the most wonderful work which mortal man has yet achieved; so vast, so intricate, and so profoundly simple, with such strange, delightful recesses in its grand figure, so difficult to comprehend within one idea, and yet all so consonant that it ultimately draws the beholder and his universe into its harmony. It is the only thing in the world that is vast enough and rich enough"?—"Our Old Home," by Hawthorne, vol. ii., p. 202.

There is another suggestion for the local committee which perhaps, is not so easy as an appeal to the Dean. It is that the authorities in connexion with the bridge should issue a weekly ticket for the members, to save the trouble and annoyance of having to fish out a half-penny every time one moves into the city and returns. In these days of free bridges it is very irksome to have a toll-keeper pouncing on you like a gigantic spider for a contribution that I should think never accumulated sufficiently to pay for the cost of the structure. Would it be too much to ask for some information on this point to be contributed to the Statistical Section?

F. S. A.

AWARDS, PARKES MUSEUM INTERNATIONAL EXHIBITION.

The following are the complete lists in the sections concerning which our readers are likely to be most interested:—

Section XIII.

DOMESTIC AND HOSPITAL ARCHITECTURE: PLANNING, CONSTRUCTION, AND DECORATIVE MATERIALS.

JUDGES.

Sir Joseph Fayrer, F.R.S.; George Aitchison, A.R.A.; Fred. J. Mouat, M.D.; Edward C. Robins, F.S.A., M.R.I.B.A.; P. Gordon Smith, F.R.I.B.A.; Professor Thomas Roger Smith, F.R.I.B.A.; Henry Saxon Snell, F.R.I.B.A.; Alfred Waterhouse, A.R.A.

FIRST CLASS.

Robert Adams, reversible windows and adjustable door-springs; Henry Doulton & Co., art stoneware; Charles Drake & Co., marble concrete; Capt. Douglas Galton, C.B., hospital plans; Howard & Sons, parquet flooring; Hulse & Horn, Balmain's luminous paint; Russell and Erwin Manufacturing Company, locks and lock furniture; Sions, Toilet, hospital plans; Wilcock & Co., architectural glazed ware; T. Worthington, F.R.I.B.A., hospital plans.

AWARD OF MERIT.

Albissima Paint Company, white Paint; Artisans', Labourers', and General Dwellings Co., Limited (Rowland Plumbe, architect), plans of dwellings for artisans and labourers; Lawrence Booth, F.R.I.B.A., plans for dwellings; M. Bordiau, plans for warming and ventilation of public buildings; Bryden & Sons, bell-hanging apparatus; Candy & Co., damp-proof bricks for building and paving; Coe & Robinson, architects, hospital plans; J. Finch & Co., bisque glazed bricks and other building materials; Grantham, jun., & Denton, jun., designs for abattoirs; Hobbs, Hart, & Co., locks and safes; Maguire & Co., oxidised iron (Banff's process); G. E. Pritchett, F.S.A., corrugated ventilating pipes, and system of construction; Silicate Paint Company, washable distemper; Smith & Turner, door springs, water bars, and bolts; A. Smith & Stevens, sill bars and casement bolts, spring hinges, door knobs, and locks; Spence's Metal Manufacturing Company, Spence's metal; James Stiff & Sons, art stoneware vases, &c.; W. Tonks & Sons, sash and fanlight fasteners and openers, steel sash-lines, bolts, chains, and other door furniture, and wedge casement stays; E. Turner, F.R.I.B.A., hospital plans; Fredk. Walton & Co., wall decorations (Lincrusta-Walton); Alfred Walker, concrete flooring; Wortley Fire Clay Company, glazed bricks and other building materials; W. Woollams & Co., non-arsenical wall and ceiling papers.

The following exhibits in this section were not considered in competition for awards, the exhibitors being judges, or otherwise officially connected with the Exhibition:—

Mark H. Judge, architect, plans of three-room dwellings for artisans and labourers, drawing for fireplace trimmer; Dr. G. V. Poore and A. Waterhouse, A.R.A., plan for the reconstruction of University College Hospital; Edward C. Robins, F.S.A., F.R.I.B.A., designs for hospitals and schools; Professor T. Roger Smith, F.R.I.B.A., designs for hospitals; H. Saxon Snell, F.R.I.B.A., designs for charitable and parochial establishments.

Section XIV.

VENTILATING, LIGHTING, AND WARMING.

JUDGES.

H. H. Collins, F.R.I.B.A.; Captain Douglas Galton, C.B., F.R.S.; George Godwin, F.R.S., F.S.A., Ernest Hart, M.R.C.S.; Professor Kerr, F.R.I.B.A.; J. P. Seddon, F.R.I.B.A.

FIRST CLASS.

Benham & Sons, general excellence; Robert Boyle & Son, general excellence; Chorlton & Dugdale, "the Sunlight" stove; T. J. Constantine, "cooking range"; Crossley Bros., "the Otto silent gas-engine"; Frederick Dyer, hot-water apparatus; H. Renton Gibbs, general excellence; Robert H. Griffin, improved register stove; W. W. Hopkinson, "Libra lamp and valve"; S. Leoni & Co., general excellence; Longden & Co., "the Leeds stove"; Musgrave & Co., general excellence; T. Potter & Sons, "the Thermhydre" grate; G. E. Pritchett, F.S.A., architect, heating and ventilating apparatus; Radiator Range Company, "Radiator cooking-range"; Rosser & Russell, general excellence; C. R. Stevens, hot-water apparatus; Strode & Co., general excellence; Verity Bros., "air propeller," and for general excellence; T. Waller & Co., general excellence; J. Weeks & Co., general excellence; Wilson Engineering Company, cooking ranges.

AWARD OF MERIT.

Robert Adams, ventilating window apparatus; J. L. Bacon & Co., general excellence; P. Hinckes Bird, F.R.C.S., ventilators; Frank W. Clark, gas machine; Comyn, Ching, & Co., general excellence; Joseph Constantine, warming apparatus; John Drysdale, M.D., & J. W. Hayward, system of natural ventilation; Fredk. Edwards & Son, general excellence; J. E. Ellison, conical ventilators; Faraday & Son, gas appliances; J. F. Farwig, calorigen; Gilmore & Clark, ventilators; William Hellier, water heaters; Harry Hunt, "Crown Jewel" stove; C. Kite & Co., chimney top; Charles Portway & Son, "Tortoise" stove; Mrs. Priestley, window ventilator; Ritchie & Co., "Lux-Calor" apparatus; Sanitary Engineering and Ventilating Co., general excellence; Steel & Garland, general excellence; Steven Bros. & Co., general excellence; Thames Bank Iron Co., general excellence; Wm. Tonks & Son, Curtail's ventilators; the Architrave Ventilator.

Section XV.

WATER-CLOSETS, SINKS, BATHS, ETC., SEWAGE AND DRAINAGE.

JUDGES.

Professor W. H. Corfield, M.D.; Rogers Field, M. Inst. C.E.; William Eassie, C.E.; R. Thorne Thorne, M.B.; Ernest Turner, F.R.I.B.A.

FIRST CLASS.

Board, Dent, & Hellyer, "Artisan" water-closet, with flushing rim and improved joint between basin and trap; valve-closet, with flushing rim and ventilation to valve-box; cast lead S and P Traps. Birmingham Sanitary Association, Potts's Edinburgh air-chambered disconnecting trap. John Bolding & Sons, Simplex valve closet, with flushing-rim and water supply to overflow; bath, with quick waste and air vessel. H. Braithwaite & Co., syphon action waster-waste preventer. W. P. Buchan, Buchan's disconnecting drain-trap. Joseph Cliff & Sons, enamelled stoneware sinks and baths. Henry Doulton & Co., Stanford's joint for drain-pipes; "Kenon" air-chamber floor, and trap; locking waster-waste preventing bath fittings. F. Dyer, tidal valve-trap. A. Emanuel & Sons, syphon action water-waste preventer, with after flush. J. Finch & Co., Buchan's disconnecting drain-trap; "Royal" porcelain bath. Hayward, Tyler, & Co., hopper-closet, with flushing rim and trap, fitted with regulator and Chandler's waste-preventing cistern. Ingham & Sons, Stanford's joint for drain-pipes. George Jennings, automatic flushing jar, and "Dubois" drawn lead traps. Walter Macfarlane & Co., excellence of iron-work. Moule's Patent Earth Closet Co., Moule's earth closet, No. 9. J. Parker, dry earth closet, self-acting without separator. J. Purnell & Son, hopper closet with flushing rim. Shanks & Co., spray and douche baths. H. Sharp, Jones & Co., Stanford's joint for drain-pipes. Thomas Smith & Co., Herbert Jones's drain-pipe. J. Tylor & Sons, valve closet with flushing rim, and without overflow connected with valve box; flushing urinal trapped in basin; waste-not closet valve, locking water-waste preventing bath fittings. F. G. Underhay, regulator for valve closets.

AWARD OF MERIT.

A. T. Angell, air-tight covers for air chambers and inspection shafts. Beard, Dent, & Hellyer, disconnecting trap for soil-pipes; disconnecting gulley-trap, with side inlets for rain-water pipes and sink wastes; syphon action flushing cistern; "Artisan" water-closet and slop-sink, combined; square enamelled iron slop-sink; lavatory basin, with quick waste. John Bolding & Sons, "National" wash-out closet, with flushing rim; syphon-action water-waste preventer; "Champion" trap. H. Braithwaite & Co., wash-out closet, with flushing rim; Claughton's trap. Edward Brooke & Sons, stoneware ribbed pipes for sewers. W. P. Buchan, drain pipes, with rest and access lid. Capper, Son, & Co., Brian Jones's patent joint. Henry Doulton & Co., Doulton's joint for drain pipes; stoneware grease trap; Latham's balance valve drain-flap; disconnecting gully-trap, with reversible top and side inlets; Lambeth flush-out closet, with flushing rim; lipped urinal, with constant flow; "vacuum" water-waste preventer. C. W. Durham, rigid construction of house drainage. A. Emanuel & Sons, chain-action water-waste preventer, with after-flush. Eureka Concrete Company, concrete sewers in segments. J. Finch & Co., porcelain sinks for butlers. Gillow & Co., lavatories for limited space. Hayward, Tyler, & Co., urinals, with treadle action; Chandler's water-waste preventer; shower and douche bath valves. Edward Howard, Saxon Snell's automatic flushing and ventilating arrangement for water closets, &c. Ingham & Sons, balance valve flap. Brown's accessible disconnecting trap. George Jennings, lipped urinals; anti-percussion bath valves; shampooing apparatus. Washington Lyon, model of fixed disinfector, by steam. Maguire & Co., method of jointing drain pipes; clean water flush tank; disconnecting trap; Dr. Scott's disinfecting stove. Henry Owen, water-waste preventer. J. Purnell & Son, white stoneware channels; Woodward's wash-out closet, with flushing rim; syphon action water-waste preventer. Wm. Ramsey, Claughton's trap. Sanitary Engineering Company, Weaver's drain disconnecting trap; Shanks & Co., Bramah valve closet, with ventilation to valve box; wash-out closet, with flushing rim; cast-iron enamelled bath; bath fittings. C. H. Sharp & Co., water closets for ships; earth closet. H. Sharp, Jones, & Co., rock concrete tubes. The Shone Drainage, Sewerage, and Water Supply Company, pneumatic sewage ejector. Steven Brothers & Co., cast iron enamelled bath. James Stiff & Sons, Weaver's drain disconnecting trap, Weatherly single-dip disconnecting trap for sinks and waste water. T. Pridgin Teale, diagrams of defective sanitary arrangements. J. Tylor & Sons, slop sink, with galvanised top and regulator valve. John Warner & Sons, valve closet, with flushing rim and movable valve seating. Robert Weare, inodorous carbon closet commode. Wilcock & Co., disconnecting gully trough closet. James Woodward, wash-out closet basin, with flushing-rim and trap; hopper closet basin, with flushing-rim and trap; porcelain sinks for refreshment bars.

The following exhibits were not considered in competition, being invented by one of the judges:—

Bowes Scott and Read: Field's flush tank; Field's annular syphon for flushing sewers.

Section XVI.

WATER SUPPLY AND FILTRATION.

JUDGES.

Prof. François de Chaumont, M.D., F.R.S.; R. B. Grantham, M. Inst. C.E.; Professor Prestwich, F.R.S.

FIRST CLASS.

E. & J. Gardner, various forms of filters on Major Crease's (now Lieut.-Col. Crease, C.B.) patterns; also, "Carferal" filtering material; Silicated Carbon Filter Company, filtering medium and filters, with asbestos strainer; Spongy Iron Domestic Filter Company, water filters, spongy iron and prepared sand, earthenware filter-cases with late improvements; J. Tylor & Sons, waste-not valve applied in various forms for cisterns, closets, courts, and alleys.

AWARD OF MERIT.

John Bolding & Sons, workmanship of cocks and valves, specimens of workmanship in lead pipes made by Graham & Fleming; Defries & Co., blocks of pumice and granulated carbon; Henry Doulton & Co., maganous carbon filter (Bernays's patent); automatic scratign cistern filter (Bailey-Denton's); A. Emanuel & Sons, deep-well pumps, valves, and cocks; Hayward, Tyler, & Co., valves and cocks; George Jennings, drawn lead pipes by Dubois; P. A. Maignen, "Filtre Rapide," with asbestos cloth, &c.; Maguire & Co., patent renewable filter; Quirk, Barton, & Co., tin-lined lead pipes; Sanitary Engineering and Ventilation Company, cistern filters, portable filters, and table filters; G. T. Tonks, glass balls for ball valves and frictionless balance supply-valve.

THE FISH SUPPLY OF LONDON.

At the meeting of the Metropolitan Board of Works on the 5th inst., the Works Committee recommended that the Board should apply to Parliament in the next Session for power to acquire, for the purpose of a fish-market, the whole or a portion of the vacant site adjacent to the Midland Railway Company's terminus, and belonging to that company, and that the engineer and architect be instructed to prepare and submit to the Works and General Purposes Committee at their first meeting after the ensuing recess all necessary plans and estimates for that purpose. Mr. Dalton, in moving the recommendation, said the proposed site was 15 acres in extent, and was close to the Midland, Great Northern, and North-Western Railways. Good roads surrounded the land, and it was easy of access from all parts of the metropolis. A canal close to it also afforded the means of bringing up fish in boats. An amendment, moved by Mr. Selway, "That the Board do apply to Parliament in the next session for power to acquire for the purpose of a fish-market a site in the neighbourhood of the principal railway termini north of the Thames, and that the engineer and architect be instructed to prepare plans of such sites as they may consider eligible for the purpose, and submit them to the Works Committee at their first meeting after the recess," was adopted by twenty-six to nine.

The report of the Special Committee on the Fish Supply, which was submitted to the Court of Common Council on Thursday afternoon last, is a voluminous document of ten closely-printed

pages. The Committee plainly record their opinion of the absolute inefficiency of the approaches to Billingsgate Market, and, though the market has been enlarged and reconstructed, additional market accommodation is absolutely necessary. They unanimously arrive at the conclusion that one wholesale market is calculated to meet the requirements of the trade and the interests of the public, and that it should be at the waterside. There should be ample and sufficient approaches from all parts of the metropolis to the site of any wholesale fish-market. Should the Court concur in the opinion that the market should be at the waterside, they suggest two sites for consideration, — one at Blackfriars Bridge and the other by the addition of the Custom House to the site of Billingsgate. They do not recommend the St. Katharine's Docks site. If the Court should be of opinion that an inland market for railway-borne fish is also required, they suggest either a site in Farringdon-road, north of Charterhouse-street, or the site of the present Farringdon Market. There should be a wholesale, semi-wholesale, and retail market, all under one roof; with no restrictions as to hours of business.

CASES UNDER THE FACTORY ACTS.

At the Aldershot Petty Sessions on the 3rd inst., Messrs. Martin Wells & Co., builders, were summoned for employing Edward Goldring, under sixteen, more than six days in a week. Mr. Hills, on behalf of the firm, pleaded guilty, and said it was an oversight on the part of the timekeeper. Mr. W. H. Beedon, District Inspector of Factories, said there were three cases against the firm, whom he had cautioned more than once. He would, however, only enter into one. The Bench fined defendants 1*l.*, including costs.

At the Lambeth Police-court, on the 6th, Mr. John Loat, a brickmaker, Acre-lane, Brixton, appeared to several summonses for infringing various sections of the Factory Act. Mr. Redgrave said there were five summonses against the defendant, viz., for not keeping a register of the young persons in his employ, illegally employing children under thirteen after one o'clock in the day, having boys without a proper certificate, not producing the certificates of half-time, &c. Mr. Fullagar, who appeared for the defendant, said it was entirely through the ignorance of the brick-moulders of the conditions of the Act of Parliament that this had happened. *They* employed the boys really, although, of course, there was no disputing that the defendant, as the occupier of the works, was responsible. In future the moulders would be careful not to act in such a manner again. No doubt the defendant was to blame for not having kept a proper register. Mr. Redgrave said it was highly important the Act of Parliament should be carried out, and he therefore asked for penalties. He had sent papers to the defendant giving him information of what he should do, but he had taken no notice of the Act. Mr. Saunders, the magistrate, observed it was quite clear the Act of Parliament had not been carried out by the defendant, who would have to pay 25s. fine, together with 20s. costs.

CASES UNDER THE BUILDING ACT.

Mr. Charles Lavender, of The Ferns, Wimbledon, was summoned, at Worship-street, on the 3rd inst., for expenses incurred under the 47th section of the Building Act.

The complainant was Mr. Meeson, district surveyor for East Hackney, North. It appeared that the premises in question were erected, or begun, by a builder named Parker, for a merchant named Middleton. Mr. Meeson surveyed the premises from time to time, but in consequence of irregularities, and their being erected contrary to the demands of the Act, he served notices on the builder to amend them. The work not being done as required, summonses and various processes followed, fines being inflicted for non-compliance. Orders were obtained for the requisite work to be done, and after a certain lapse of time, the work not being done in the interim, the surveyor, in accordance with the Act, put the matter into the hands of a builder to see the works carried out as required by the Act. Thereby he incurred expenses amounting to 124*l.* 4s. 10d.; his own fees, travelling expenses, &c., a further sum of 29*l.* 11s. 6d.; and a sum of 5*l.* 5s. was charged as solicitor's costs for advising him as to his position under the Act, the total 159*l.* 1s. 4d., being sought to be recovered by these proceedings. The question raised by Mr. Mugliston for the defendant was whether the right person had been summoned.

The complainant proved that Mr. Lavender was trustee of Middleton's estate under the bankruptcy of the latter, and it was argued that he was therefore the "owner" of the premises within the meaning of the Act.

The Magistrate (Mr. Bartlow) decided that he had no power to make an order on the trustee in bankruptcy, and thought there had been a want of diligence on the part of the surveyor, who might earlier have sued Middleton.

A summons previously taken out against the freeholder (Mr. Button) for these expenses had also been dismissed, Mr. Hosack considering he was not owner within the meaning of the Act.

NEGLECT OF BUILDING BY-LAWS.

At the Edgware Petty Sessions, C. B. Walker, a builder, of Willesden, was charged, at the instance of the Willesden Local Board, with contravening their by-laws by neglecting to put in concrete foundations, using macadam slop in lieu of mortar, and using rotten bricks in the construction of certain houses being erected in the Melville-road, Harlesden. Mr. Tilley prosecuted on behalf of the Willesden Local Board.

The evidence showed that the builder had totally disregarded the notice of the Local Board, and the buildings were disgraceful, and would be unfit for habitation. It was also shown that the mortar in the walls smelt very strong, and contained 8½ per cent. of organic matter, animal and vegetable.

The Bench fined the defendant in the aggregate 10*l.*

The same defendant was then charged with using threatening language towards Mr. O. O. Robson, the Surveyor to the Willesden Local Board, who gave evidence in the former case.

Mr. Robson said that the defendant shook his fist in his face and threatened to do for him, and to break one of the bricks complained about over his head.

This was corroborated by Dr. Danford Thomas, the medical officer.

The defendant was then fined 20s., 8s. costs, and ordered to find two sureties of 25*l.* each to keep the peace.

"DAMP: A QUESTION."

Sir,—In answer to the question of "X.Y.Z." (p. 159), I beg to offer the opinion that the Portland cement floors, resting on a bed of clay, being highly non-conductive, remain colder than the air some time after a change to warmer temperature in the air, and consequently condense moisture from the warmer air coming in contact with their surfaces.

The correctness of this opinion may be tested by chipping off a small piece of the wet surface of the Portland cement floor, when the substance of the floor beneath the surface will be found to be perfectly dry.

If this proves to be the correct solution, then I think it will also be found more fully correct to say the floors are wet after a change to warmer weather, and dry at all other times, instead of "wet in dry weather and dry in wet weather."

Charles Drake.

COMPETITIONS.

Lancashire and Yorkshire Railway. — The directors of this company have awarded the premiums for designs for the proposed new Exchange Station, Liverpool, as under, viz.:—1st (750*l.*), Mr. John West, 4, South Parade, Manchester; 2nd (500*l.*), Mr. H. T. Percival, Old Parsonage, Newchurch, near Manchester; 3rd (250*l.*), Mr. Thomas Mitchell, 17, St. Ann's-square, Manchester.

Govan Fever Hospital.—Out of five sets of plans submitted to the committee for the proposed new Joint Fever Hospital, for the burgh of Govan, Kinning Park, and Pollockshields, that of Mr. Frank Burnett, architect, West Regent-street, Glasgow, has been accepted.

Miscellanea.

Church of Notre Dame, Bruges.—During a storm, a few days ago, the spire of the church of Notre Dame at Bruges was twice struck by lightning, displacing some bricks and destroying part of the frame of a picture in one of the chapels. This church contains a number of valuable works of art, among which may be named the triptich of Pierre Porbus; a marble group of the Virgin and Child, attributed to Michelangelo; and the tombs of Charles the Bold and his daughter Marie. All these escaped unhurt. The spire is about 435 ft. high.

The Employes of Messrs. Clark, Bannett, & Company, Limited, took their annual holiday last Saturday, the men of the London and New Cross works dining at the Royal Aquarium, Brighton; the men of the Paris works at Robinson, a village near Paris; while the men of the New York works went to Manhattan Beach. The company appear to have covered a great deal of ground that day.

A Freehold in Great Newport-street.—The award of Mr. E. R. Robson, the arbitrator in the case of the Marquis of Salisbury *v.* The Metropolitan Board of Works, heard at the Institution of Surveyors on the 5th ult., has just been published. The claimant was freeholder of the premises, No. 13, Great Newport-street, Newport Market, at present in the occupation of Mr. Limbourne, a builder, as lessee for an unexpired term of five years, at a yearly rental of 100*l.* Mr. A. J. Smith, who appeared for the claimant, said Mr. Limbourne entered into an agreement in 1876 with the marquis's agent to take the premises, and put them into a thorough state of repair, to the satisfaction of such agent, in consideration of a lease for the term of ten years, and a yearly rent of 100*l.*, but on account of the eligible character of the site, they now claimed to have the reversion capitalised at a rental of 200*l.* per annum.—Mr. Spencer Chadwick, auctioneer and surveyor, of Parliament-street, surveyor to the Marquis of Salisbury, said these premises comprised a superficial area of 1,780 ft., depth nearly 100 ft., with a frontage to Great Newport-street of 22 ft. 4 in. He estimated the present annual value of the premises at 210*l.*, and adopting the four per cent. table, was of opinion that the claimant was entitled to compensation amounting to 4,110*l.*—Mr. Limbourne (the occupier) said he expended in fulfilling the stipulated repairs a sum of 534*l.* 19s. 1d. prime cost, the builder's profit on which would have been 20 per cent. He should not mind giving 220*l.* per annum for the premises now: they were so suitable to his business, and in the midst of his customers.—On behalf of the Metropolitan Board of Works, Mr. Porter, architect and surveyor to the Sun Fire Office, said in his judgment the letting value of this property was 120*l.* per annum, which he should capitalise at five per cent. He dealt with the present rent from Midsummer, four years and a half, on the five per cent. table, and afterwards 120*l.* per annum on the five per cent. table, making 2,225*l.*, which, with 222*l.* for compulsory sale, amounted to 2,447*l.* The arbitrator has awarded the claimant 2,988*l.*

The New Tay Bridge.—At a meeting of the Dundee Town Council on the 4th inst., Mr. Buchan referred to the propriety of the Council opening negotiations with the directors of the North British Railway Company and the authorities of Perth and Newburgh, with the view of lowering the height of the new Tay Bridge from that fixed on the plans passed by Parliament. He thought this should be done in the interest and for the greater confidence and safety of the travelling public, and he moved that a special committee be appointed for this purpose. It contended that but for the non-suspension of the Standing Orders they would have had a 58 ft. 6 in. bridge, and an arrangement made between the railway company and the Perth and Newburgh authorities. It was contended by other speakers that the appointment of such a committee would do harm, as it would create an agitation which would be likely to delay the erection of the bridge, and there was no hope that it could be put up at a lower height, as both Parliament and the Board of Trade had approved of the 77 ft. height. After considerable discussion the motion was carried by 14 to 7.

The Sunday Society and the International Medical Congress.—Last Sunday by Grace the Duke of Wellington having issued invitation cards through the Committee of the Sunday Society, the foreign members of the Medical Congress visited Apsley House, for the purpose of inspecting the fine art collection and objects of historic interest which it contains. The Museum of the Royal College of Surgeons, Lincoln's Inn Fields, was also open during the afternoon to the members of the Congress. Professor Flower, one of the Society's vice-presidents kindly explaining the contents.

Another New Building for Liverpool.—The Council of the Liverpool University College, just incorporated by Royal charter, having elected 100,000*l.* for the endowment of chairs, have purchased a site for 19,000*l.* covering 13,000 square yards, on which they propose that the Liverpool Municipal Council shall erect the buildings necessary, and let the same to the on a lease of seventy-five years at a nominal rent.

A Fine Art and Industrial Exhibition and Workmen's Flower-show has just been held at Bristol. The architect appointed to plan and direct the arrangements of the various buildings was Mr. E. Henry Edwards.

The Inner Circle Railway Completion.—Once more there appears to be a fair prospect of this urgent work being carried out. A special meeting of the City Commission of Sewers was held at Guildhall on the 4th inst., to receive a communication from the chairmen of the Metropolitan and Metropolitan District Railway Companies, relative to the completion of the Inner Circle Railway, and the proposed street improvements in connexion therewith. Mr. Ashby, who presided, said at their last meeting some mention was made of street improvements that were projected in Tower-street and Eastcheap, in relation to the Inner Circle Railway, and there was a general desire that the matter should not be allowed to slumber, and that the improvements should not be lost if it could be helped. By the Act of 1879 authority was given to the Court, in conjunction with the Metropolitan Board of Works and the railway companies, to carry out the work, but no price was inserted in the statute. Various proposals were made, but they came to nothing, and finally the Metropolitan Board of Works offered to contribute 100,000*l.* towards the street improvements, and the Commission 250,000*l.* and no more; but the railway companies would not agree to those terms. In these circumstances the Lord Mayor and he (Mr. Ashby) had an interview with Sir Edward Watkin, M.P., and Mr. J. S. Forbes, the chairmen of the two companies, and the result was that those gentlemen had undertaken in writing to recommend their constituents to make the street in connexion with the railway if the contribution from the public bodies were increased from 750,000*l.* to 800,000*l.*, and in the hope that the contribution might be payable as sections to be agreed upon were completed, so as somewhat to reduce the inevitable loss of interest on outlay. Mr. George Shaw moved that the Court agreed to contribute 800,000*l.* to the proposed street improvements and new street, 60 ft. wide, in connexion with the Inner Circle Railway completion, and that it be referred to the Finance and Improvement Committee to prepare the necessary agreement, reporting thereon to the Court. This was carried unanimously.

The Sanitary Condition of Oxford Lodging-houses.—The University authorities are about to call on many of the lodging-house keepers to conform to certain sanitary requirements recommended by Mr. Griffith, C.E., whom, as we stated some time ago, they have employed to inspect every lodging-house, and they have also required those who have well-water to have it tested by the University analyst. We are told that a strong feeling of indignation has been raised in the city against the course pursued by the University, and the matter was on the 4th inst. brought before the Local Board in the form of a report from the General Purposes Committee, as follows: — "Lodging-houses.—The delegates of the University lodging-houses having issued a large number of circulars among the ratepayers of Oxford, requiring them to make many and various alterations in the sanitary arrangements of their houses, without the knowledge and authority of the Local Board, which is the only legal sanitary authority in Oxford, the committee recommend that the clerk be requested to write to the delegates, informing them that any alterations affecting the sanitary arrangements of the dwelling-houses in the district should be submitted to the Board for their approval." After some discussion, a resolution giving effect to the recommendation contained in the report was adopted.

Art in Manchester.—The governors of the Royal Manchester Institution have resolved to accept the terms offered by the Corporation with reference to the transfer to the latter body, in trust, for the use of the public, of the building and its contents. The expenditure of 4,000*l.*, annually, by the Corporation, upon works of art, is to be limited to a period of twenty years. The managing committee will consist of two-thirds members of the Corporation, and one-third representatives of the Royal Institution.

The Sale of Barnard's Inn.—Mr. Justice Fry gave judgment on Monday, according to the *City Press*, upon the demurrer of the defendants in the action of "Harvey *v.* The Principal and Antients of Barnard's Inn." The action was brought by the plaintiff to establish an alleged contract for the sale of Barnard's Inn for 50,000*l.* The defendants demurred, on the ground that the correspondence disclosed no contract. Mr. Justice Fry allowed the demurrer.

The Harvey Tercentenary Memorial.—A statue to Dr. Harvey, the discoverer of the circulation of the blood, was unveiled on Saturday last at Folkestone by Professor Owen, in the presence of a large number of the distinguished British and foreign physicians who have been attending the International Medical Congress. Harvey was a native of the town, and the memorial, which is in commemoration of the three hundredth anniversary of his birth in 1578, took its rise at the instigation of Dr. George Eastes, a member of the medical profession, at a public meeting held in the Town-hall at Folkestone, presided over by the then mayor, and at which resolutions were adopted for raising a fund for the purpose. The statue is a bronze figure, some 10 ft. or 12 ft. high, placed on a pedestal of granite, and is the work of Mr. Albert Bruce Joy.

The International Medical and Sanitary Exhibition.—This Exhibition will finally close on Saturday, August 13th. The amount of public interest which it has evoked has been very considerable indeed, as will be seen from the following statement of the number of visitors up to last Wednesday evening:—

Opening day	4,340
Total daily admissions by payment	11,973
Total number of season ticket-holders	1,729
	18,042
Estimated number of members of Medical Congress admitted free	1,500
Estimated number of Fellows and other ticket-holders of the Royal Horticultural Society admitted free	2,000
Total number of visitors from July 16 to August 10, allowing only for one visit by each season ticket-holder	21,542

Fire in a Spanish Circus.—The new circus which was erected a short time ago in Madrid for the exhibition of those popular Spanish contests, the bull-fights, was totally destroyed by fire a few days back. The structure was of extraordinary size, and could conveniently accommodate an enormous number of spectators on its seats. The fire broke out about five o'clock in the afternoon. The place was already filled with a multitude numbering 14,000 persons. The final preparations were being made for the fight, when, as the spectators were momentarily expecting the entrance of the bull and his antagonists, smoke was observed issuing from a box near the orchestra. The alarm was instantly given, and the vast assembly had all left the building within a few minutes, and without a single accident. An hour after the entire edifice was in ashes.

Art-Union of London.—The pictures selected by the prizeholders of 1881 are now on view in the new galleries, No. 112, Strand. We lately gave a list of the principal works selected, so that we need scarcely say more now than that they form a very interesting collection. We may add that any person is admitted to view the pictures on presentation of a visiting-card.

State Aid to Provincial Art and Industrial Museums.—On the order for going into Committee of Supply on the Education Estimates, on Monday evening last, Mr. Collings moved "That, in the opinion of this House, grants in aid of art and industrial museums should not be confined to London, Edinburgh, and Dublin." The amendment was lost by 85 to 48.

Employment in New York.—Our recent observations on the growth of New York has brought us inquiries from six or seven correspondents as to the prospects there for English assistants to civil engineers and architects. We cannot, however, take the responsibility of recommending any of our readers to make so long a journey on speculation.

Art Production in Germany.—The Berlin correspondent of the *Morning Post* says that the over-production of works of art in sculpture and painting proceeds in Germany at an alarming rate. The applications for admission to the annual exhibition at the Royal Academy exceed those of 1880 by one-third.

At Mobberley (near Alderley Edge) it is intended to build at once a new Wesleyan chapel, the trustees having engaged Mr. Councillor John Wills, of Derby, as their architect. The plan includes school-room and class-room, and the design adopted is Early Gothic in style.

Sir John Soane's Museum.—We are asked to mention that at a recent meeting, the Life Trustees of this institution elected as their colleague (in the terms of the Act of Parliament) Mr. George Godwin, F.R.S., to fill up the vacancy caused by the lamented death of their late co-trustee, Mr. Frederic Ouvry.

TENDERS

For new premises for Mr. S. Joseph, High-street, and Tontine-street, Folkestone. Mr. Reginald Pope, architect:—

Clemmans	£1,985 0 0
Slade	1,875 0 0
Webster	1,850 0 0
Baker	1,800 0 0
Prebble	1,794 0 0
Dunk	1,790 0 0
Mercer	1,720 0 0
Tunbridge	1,710 0 0
Petts	1,704 0 0
Holdom	1,695 0 0
Brooks	1,626 0 0

For alterations at the Adelaide, Liverpool-road, for Mr. Budd. Mr. H. J. Newton, architect. Quantities supplied:—

Anley	£770 0 0
Beale	690 0 0
Buckle	675 0 0
Walker	649 0 0
Hawkins	584 0 0
Cole (accepted)	495 0 0
Pewterers' Work.	
Heath	£87 10 0
Watts	83 7 0
Richards	80 0 0
Matthews	76 12 6
Mott (accepted)	70 0 0

For painting the exterior of the Union workhouse at Bromley, Middlesex, and the exterior of the workhouse premises at Ratcliff, for the Guardians of the Stepney Union. Messrs. A. & C. Harston, architects:—

Crisp & Toulmin	£394 0 0
H. T. Shepherd	320 0 0
A. W. Derby, West India-road*	284 0 0

* Accepted.

For alterations to 71, 73, and 75, Brompton-road, for Mr. J. Gooch. Quantities supplied by Mr. Henry Lovegrove. Mr. George Edwards, architect:

Richardson	£3,466 0 0
Aldin & Sons	3,081 0 0
Gillham & Co.	2,980 0 0
Martin, Wells, & Co.	2,830 0 0
Goad	2,826 0 0
Scrivener & Co.	2,824 0 0
Canning & Mullins	2,820 0 0
Tarrant & Sons	2,750 0 0
Woodward	2,750 0 0
Hickinbotham (too late)	2,700 0 0
Green	2,698 0 0
Stimpson & Co. (accepted)	2,632 0 0

For alterations to 11, Brompton-road. Mr. George Edwards, architect:—

Stimpson & Co.	£254 0 0
Richardson	237 0 0
Green (accepted)	232 0 0

For building thirty sets of flats in Boundary-road, Camberwell, for Mr. A. Stedall. Quantities supplied by Mr. H. Lovegrove. Mr. George Edwards, architect:—

Green (accepted)	£4,550 0 0

For erecting Nos. 1, 2, and 3, Wychcombe-villas Haverstock-hill, for Mr. T. D. Bellamy. Mr. R. Groom architect:—

Toms	£3,723 0 0
Nash	3,575 0 0
Langmead & Way	3,458 0 0
Gregory & Bence	3,339 0 0
Gould & Brand	3,317 0 0
White (accepted)	3,279 0 0

For alterations and additions to Kilgobbin Cottage, Castelnau, Barnes, for Mr. T. W. Gilbert. Mr. Fredk. Rogers, architect:—

J. H. Hayden	£685 0 0
T. Potterton	675 0 0
P. H. Jordan	561 0 0
P. J. McManus	531 0 0
T. W. Woolf (accepted)	420 0 0

For the extension of warehouse, No. 1, Marsh Gate-lane, Stratford, for Messrs. T. H. Harris & Sons. Mr. J. T. Newman, architect:—

E. Lawrence	£532 0 0
R. Abrahams	478 0 0
A. Reed	454 0 0
North, Bros. (accepted)	418 0 0

For repairs, &c., to Odessa-road schools, Forest-gate, for the West Ham School Board. Mr. J. T. Newman, architect:—

North, Bros.	£135 0 0
R. Abrahams	115 0 0
A. Reed (accepted)	86 10 0

For repairs, &c., to South Hallsville schools, Canning-town, for the West Ham School Board. Mr. J. T. Newman, architect:—

A. Crabtree	£187 12 6
A. Reed (accepted)	145 0 0
North, Bros. (accepted)	120 0 0

For repairs, &c., to Balaam-street schools, Plaistow, for the West Ham School Board. Mr. J. T. Newman architect:—

North, Bros.	£130 0 0
R. Abrahams	115 0 0
A. Reed (accepted)	97 0 0

For the erection of proposed school church, West Silvertown, for Rev. H. J. Bodily, M.A. Mr. J. T. Newman, architect:—

	Brick Church.	Iron Church.
A. Reed	£370 0 0	£330 0 0
North, Bros.	366 0 0	303 0 0

For additions to the Banstead School, Banstead, Surrey, for the Managers of the Kensington and Chelsea School District. Messrs. A. & C. Harston, architects:—

J. B. Potter, Sutton (accepted)	£3,583 0

For alterations and additions at the Gloucester Arms public-house, Leighton-road, Kentish-town, for Messrs. Watney & Co. Mr. J. R. Furniss, architect:—

Gann	£1,446	0	0
Toms	1,321	0	0
Hockley	1,293	0	0
Taylor	1,267	0	0
White	1,241	0	0
Apley	1,170	0	0
Wall, Bros.	1,123	0	0
Lamble (accepted)	1,090	0	0

For alterations and additions to No. 103, King's-road, Brighton. Mr. Arthur Loader, architect:—

J. M. Newnham, Brighton	£334	0	0
G. R. Lockyer, Brighton	327	0	0
Holloway, Brighton	315	0	0
W. Hackman, Brighton (accepted)	305	0	0

For alterations and repairs to Nos. 84 and 85, Buckingham-road, Brighton. Mr. Arthur Loader, architect:—

G. R. Lockyer, Brighton	£1,188	0	0
J. M. Newnham, Brighton*	1,177	0	0

* Accepted.

For two houses at Shoreham, for Captain Peake. Mr. Arthur Loader, architect:—

Wm. Burchell, Shoreham (accepted)	£1,350	0	0

For villa residence at Southdowns, Shoreham. Mr. Arthur Loader, architect:—

Wm. Burchell, Shoreham (accepted)	£978	0	0

For alterations to business premises, High-street, Shoreham. Mr. Arthur Loader, architect:—

Thos. Willett, Shoreham	£150	0	0
J. King, Southwick	143	0	0

For two cottages, Beeding-road, Steyning, Sussex. Mr. Arthur Loader, architect:—

C. Curd, Shoreham (accepted)	£427	0	0

For new roads, sewers, and surface water-drains for The British Land Company, Limited, on their estate at Tottenham. Mr. Henry B. Michell, surveyor:—

Keeble, Regent's Park	£3,743	0	0
Crockett, St. Pancras	3,184	0	0
Thompson & Son, Battersea	3,300	0	0
Harris, Camberwell	3,224	0	0
Peill, Bromley	3,150	0	0
Pizzey, Hornsey	3,100	0	0
McKenzie & Co., City	3,058	0	0
Wilson, Walthamstow	2,940	0	0
Dunmore, Hornsey	2,795	0	0
Jackson, Leyton	2,777	0	0
Acock, City (accepted)	2,733	0	0

For new roads, sewers, and surface water-drains for The British Land Company, Limited, on their estate at Kingston. Mr. Henry B. Michell, surveyor:—

Keeble, Regent's Park	£1,944	0	0
Dunmore, Hornsey	1,844	0	0
Thompson & Son, Battersea	1,790	0	0
Wilson, Walthamstow	1,740	0	0
Crockett, St. Pancras	1,698	0	0
Peill, Bromley	1,549	0	0
Harris, Camberwell	1,523	0	0
McKenzie & Co., City	1,527	0	0
Pizzey, Hornsey	1,525	0	0
Acock, City	1,497	0	0
Jackson, Leyton (accepted)	1,414	0	0

For new roads and sewers for The British Land Company, Limited, on their estate at Millwall Docks. Mr. Henry B. Michell, surveyor:—

Crockett, St. Pancras	£2,145	0	0
Dunmore, Hornsey	2,107	0	0
Thompson & Son, Battersea	2,000	0	0
McKenzie & Co., City	1,981	0	0
Keeble, Regent's Park	1,800	0	0
Wilson, Walthamstow	1,793	0	0
Jackson, Leyton	1,777	0	0
Acock, City	1,773	0	0
Harris, Camberwell	1,737	0	0
Peill, Bromley	1,720	0	0
Pizzey, Hornsey (accepted)	1,700	0	0

For the erection of new premises, 24, Budge-row. Mr. Walter Stair, architect:—

	Stone Front.			Brick Front.		
North, Bros.	£3,400	0	0	£3,200	0	0
Simpson & Son	3,289	0	0	3,175	0	0
Gladwell	3,287	0	0	3,137	0	0
Perkins	3,146	0	0	3,045	0	0
Faulkner	3,146	0	0	3,030	0	0

For building six shops, St. Stephen's-terrace, Shepherd's-bush, for Mr. Bax. Mr. H. E. Pollard, architect:—

J. Boarder (accepted)	£1,220	0	0

For alterations and additions at the Adam and Eve, Hoxton-street, for Mr. Gilbert. Mr. H. E. Pollard, architect:—

O. G. Smith	£376	7	0
Marsland	307	0	0
Weston	289	0	0
Jackson & Todd (accepted)	279	0	0

Pewterer's Work.

T. Heath	114	0	0

For building wing and other works at 12, Mansfield-villas, Haverstock-hill, for Mr. D. Bax. Mr. H. E. Pollard, architect:—

Howard & Dorrell	£235	0	0
Conway	216	0	0
J. Vears (accepted)	215	0	0

For the formation of new roads, sewers, and other works, on the Willesden Park Estate, Willesden, for the Metropolitan Railway Company. Mr. Water Graves, architect. Quantities by Mr. H. E. Pollard.

Wall, Bros.	£1,300	0	0
Keeble	1,195	0	0
Botterill	1,174	0	0
Killingback	1,149	0	0
Crockett	1,139	0	0
Nowell & Robson (accepted)	1,033	0	0

For repairs and general re-instatements to sixteen houses, Newton-road, Tottenham, for The Official and General Permanent Building Society. Mr. H. E. Pollard, surveyor:—

R. Hunt (accepted)	£446	0	0

For alterations and additions to the Boys' Coffee Tavern and Club, 178, Brompton-road. Mr. Alfred Williams, architect. Quantities by Mr. H. E. Pollard.

Sanders	£1,026	0	0
Matthews	951	0	0
Cra-ke	877	0	0
Stimpson & Co.	830	0	0

Roads, Stanford Estate, Brighton.—Mr. Henry Woodham says the amount of his tender was 3,419*l.*

TO CORRESPONDENTS.

H S C B & Co.—H. J. N.—E. P.—W. E. B.—C. & Co.—W. B B S.—C. C H.—K. G.—L.—W. F.—J. M. W.—P. G.—G. B & Sons—F. A. S R. L. A. L.—J. M.—P. V. G.—R. F.—H. J. P.—Mr. P.—F. H. E. H. B.—J. W. W.—S. & Co.—W. S.—J. & W.—H. C.—A. J. H.—J. T. R.—A Builder (we are forced to decline pointing out books).—Kilross (we gave particulars of the brothers Adam not long ago, including some new facts towards the history of the family).—E. R. W. (will have to advertise).—E. T. O. (we cannot advise).—H. H. (next week, if not sent elsewhere).—W. M. (little).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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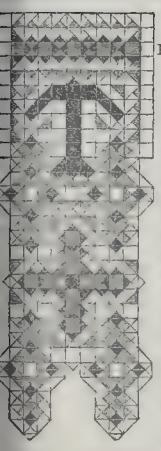
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Lodge Architecture.

THE lodges which stand as the advanced guards on the approach to a house form a special class of domestic architecture, capable of a good deal of characteristic treatment and expression. At various times there have been attempts to give to them a distinctive and marked character; at other times they have subsided into the strictly utilitarian. This latter fate, however, has befallen them, chiefly at a time when house architecture on a larger scale has also been strictly utilitarian.

In general, a lodge has been considered an opportunity for some effort at prettiness on the part of the architect.

At one time there was a very general feeling in favour of rustic lodges,—a taste rather fostered by landscape-gardeners, whose ideas of the picturesque it fell in with. What is called rustic architecture, in the old landscape-gardeners' sense, however, must always be regarded as a false taste when applied to buildings for actual habitation. Its most excusable employment is, perhaps, in the formation of arbours and shelters in the midst of garden and plantation scenery, and even then the taste is a questionable one. In the application of rustic architecture to habitable lodges there is, moreover, the drawback that it almost invariably leads to the construction of an uncomfortable and somewhat unsanitary dwelling. The idea that lodges should be considered in regard not only to their appearance, but to the comfort of those who have to live in them, is, in fact, only a recent one. It used to be considered sufficient to make the lodge an attractive feature externally, and then the cutting up of the interior into habitable rooms was proceeded with as a kind of after-thought. If it were a Classic lodge, the most ingenious trickery had to be resorted to, to conceal the windows and chimneys; the thing being really a kind of architectural model into which some inhabitants were to be got somehow, in order to turn it to a useful purpose. If it were not for the comfort of the inhabitants, or if the lodge were used merely as a kind of sentry-box for an attendant to sit in during the day, it might afford a pardonable opportunity for trying a little architectural modelling and reproduction, but it is hardly fair, nor architecturally truthful, to treat a cottage dwelling, which the lodge really is, in that way.

The lodge is, in fact, an opportunity for a little rather interesting experiment in architectural expression on a small scale. It should be a kind of forecast of the architecture of the house at the entrance of whose grounds it stands. It should prepare the visitor for the general style and design of the house, and the materials of which the latter is constructed. But, at the same time, it should never look like a slice of the house cut out and stuck down at the entrance, as is sometimes the case. It must have its own scale and character distinctly marked, showing the features of the house architecture adapted to the scale of a smaller building. And it must never look like a diminutive house itself, *i.e.*, like a larger house seen on a smaller scale. There should be something piquant and unusual about its arrangement, such as would be suitable in a cottage, but not on a larger scale.

The first point in aiming at this is the treatment of the plan. The plan must not be a square or a cube, with the various sized rooms in the interior fitted in behind the walls, and with no indication of their arrangement. This is, of course, a questionable way of treating even a building of large size; but there may be something to be said for it in cases where stately and grandiose effect is especially aimed at. But this, of course, can never be achieved on a small scale. A small building, placed in a prominent position, must aim at being interesting by a certain picturesqueness and unusual character of arrangement. The lodge to a house of the ordinary size will generally consist of a living-room and one or two small bedrooms, and scullery and other offices. The arrangement of the living-room so as to separate it a little from the rest of the plan,—placing it in a semi-angular position in regard to the other block, giving it a circular or octagonal form,—such devices as these will serve to give some character to the general disposition of the little building in a way which would be quite unsuitable in a building on a larger scale, and without impairing its practical suitability as a plan. If, on the contrary, these few requisite rooms are all inclosed in one cube of brickwork or masonry, the essential character of the building as a "lodge"—an ornamental house of attendance at the gateway of the grounds,—is entirely lost; the building becomes merely a cottage, or a specimen of model dwellings for the working-classes.

This latter character it should have in one sense, however, more than it generally has. Far too often the planning and sanitary arrangements of the lodge are carried out in a rather primitive manner. All the rooms open out of each other; the living-room opens blankly on the outer air without any sort of porch or pent-house to defend it, and occasionally a lodge is assigned to married people with children, with only one bedroom, an arrangement long since condemned even for the poorest class of people's dwellings. We have met with instances of such lodge-planning as this in vicinities where it would not have been expected; but such arrangement, or want of arrangement, is very much to be deprecated. A lodge ought to be a model cottage in the sense of being a model plan; a collection of only three or four rooms planned so as to get the greatest amount of comfort and isolation of the different rooms which the available space will allow, and at the same time, so as to present a little piquancy in planning which may remove it from the category of the mere cottage, and show that there has been an intention to make it architecturally effective as well as comfortable.

What style of architectural effect the lodge should aim at ought to depend a good deal on what is the character of the house to which it stands sentry. At present there is a tendency towards a fashion for very picturesque lodges, buildings all run to roof, as one may say, and the windows stuck all over them at random. But this is really quite out of place unless the house itself is a building of the same sort, with a confusion of high irregular gables and low walls and dormers, and a generally rabbit-warren appearance. There was a set of fashion in favour of this rabbit-warren domestic architecture a few years ago, but it seems to be already declining. Experience very soon proves that the rabbit-warren style is not the best for a comfortable house, however well it may look in a picture. The style is not so architecturally unsuitable to a lodge, but if the house is built in a dignified and really architectural style, there seems no reason why the proprietor or his architect should descend to hut-building when they come to the entrance-gate.

Keeping, then, to the main style of the house as the model for the architecture of the lodge, and giving to the plan, as aforesaid, a certain piquancy of arrangement, we shall find various ways of imparting to the design the same degree of piquancy, such as the style adopted admits of. If the architecture partakes of Classic or Italian character, we may assume absolute uniformity or symmetry of design if we like, provided we are careful to give to this symmetrical design the character of elegance rather than of massiveness or dignity. But even with Classic design a little playfulness in the design of the lodge is best; a circular or semicircular porch introduced at "an odd angle," or some such feature happily treated, will take away from the serious formality which would otherwise attach itself to the style, and give an appearance of graceful irregularity. This, of course, may be much more easily done in the case of a lodge partaking more of Gothic character, where a certain degree of unsymmetrical arrangement appears quite natural and unforced. Fanciful character may be obtained, too, by reversing the usual order of things in some minor incidents of the building. In the case of lodges which are intended to be picturesque half-timbered cottage buildings, this fanciful effect has been often sought in making the upper story oversail the lower (where there

are two stories), a treatment naturally enough suggested by the treatment of street houses in many of our old towns which were originally built in half-timbered architecture. But this same treatment, making the superstructure oversail the ground story, or the surbase (if the building is in one story) may be applied to Classic design also, on a small scale, with very happy and picturesque effect. The treatment of the windows, again, influences the architectural expression of the structure. Lofty windows impart a palatial effect, low and wide windows give an expression of quietness and domesticity suitable to a small domestic building. These are indications of the manner in which special expression may be imparted to the lodge, employing the same architectural style and similar features as in the house itself, but treating or grouping them differently.

Chimneys are susceptible of a great deal of characteristic treatment in lodge architecture also, and are in this case more important objects than in larger buildings, since their actual size must be nearly the same in any case, and they are therefore much more conspicuous objects in a small building, much nearer the eye and much more important in their effect on the whole. It is, therefore, peculiarly suitable in a lodge to pay some attention to the design of the chimneys, and to endeavour to render them in a special degree an ornament to the whole instead of an eyesore. But the attempt to give more architectural importance to our lodge by adding some unnecessary feature, such as a tower or a cupola on a small scale, is not to be regarded as in any better taste in this case than in larger works of architecture. It sometimes apparently is so regarded; it is considered that in a lodge one may indulge the fancy for making ornamental architecture; but the result is only likely to look artificial and pretentious, and to excite sarcastic comments. The lodge should not be a mere piece of ornamental architecture, but a necessary adjunct treated with as much fancy and ornamental effect as its practical uses suggest and admit of.

The entrance-gate should be regarded and treated as a part of the lodge design. It is not sufficient to build gate-piers and hang between them a respectable-looking and well-constructed gate. The gate-piers should belong to the design of the lodge, and the nearer one of them, if the lodge is a one-sided one, should be closely connected with the design of the building. When a lodge on a rather larger scale is built, a fine and complete effect is produced by throwing a part of the building over the gateway, or at least roofing over the entrance and throwing a large arch across between the opposite lodges. This refers to a rather larger class of building than that which we have been suggesting, or to a double edition of such a building,—one, perhaps, used as a gardener's cottage, and it is a device only worth adopting when there is a decided intention to produce something bordering on an effect of stateliness. And where this form of entrance is adopted, we regard it as a matter of rigour that the two opposite lodges, which thus form buttresses to the gateway, should be identical in design, at all events in their general mass and size, even if small details may be varied. The employment of an arched entrance such as this between two lodges of different shape and size, as we have seen it done with a view to picturesque irregularity, is quite a mistake. The result is a lob-sided appearance, and the loss of all the effect of stateliness of approach which the use of the arched entrance is calculated to produce, and which, when the lodge buildings are on this extended scale, may be supposed to be the aim of the architect, as grace and piquancy should be his aim in dealing with the small single lodge only, which is the more usual form of entrance building.

The roofed gateway to a double lodge has the practical advantage of providing for one point of convenience which in the single lodge is often overlooked altogether. This is in regard to the fact that the main duty, or, at least, a constant duty, of the inhabitant of the lodge is to open the gate for visitors, and to close it afterwards; and the question of giving the gate-keeper some cover when he or she has constantly to go out to the gate in bad weather, is a matter worth considering, not only for personal comfort, but because, under such circumstances, the closing of the gate at least is likely to be better attended to. This is a complaint we have actually heard made,—that the entrance-gate was constantly open, because the lodge-keeper or his wife did not care to go out in the rain to close it. The lodge should be so placed and planned, therefore, that the door and porch should be close up to the gate,—a little matter of convenience often overlooked.

Considered in this way, in regard to its appropriate architectural expression and its practical convenience for its special object, an entrance-lodge affords a very good opportunity for the application of true and refined taste and common sense in architectural design, and its appropriate treatment is not a bad test of architectural ability, though on a small scale.

THE RELICS OF THE THEBAN KINGS.

Further reflection on the wonderful news from Egypt mentioned in our last number confirms our opinion of its extraordinary importance, and of the light which it throws on the general outline of Egyptian history, even before the translation of the papyri. As to the contents of these, of course, it would be idle to hazard a guess, although, since we last wrote, we have been told that the splendid papyrus in the coffin of Queen Ha-ta-su contains the ritual of the dead. Still it may commence with this, and yet include an account of the great works of the reign of this sovereign; and no doubt will tell us of the date of her death, which is as yet unknown. And it is no guess to say that the sequence of royal mummies, and presumably the papyri found with them, cover the date of the Exodus, according to any view whatever that may be taken of the chronology. It is not, therefore, being too sanguine to expect that we may shortly be presented with an account of this great historic event drawn up from the Egyptian point of view. It may be confidently anticipated that this will be very different from that taken by the sacred historian. Amenophis IV., whose mummy may probably be among those now discovered, is called in the inscriptions not only the "Pacificator of Egypt," but "the tamer of the Syrian shepherds." The dates of this king, who reigned for thirty-seven years, cover that of the Exodus, according to the most lucid account yet given of the chronology of the Pentateuch; and at all events the era of the eighteenth dynasty was one of the most magnificent periods, as regards the art of the builder, that has occurred in the history of the world.

We have further to add, as confirmatory of our view as to the cause of the alarm felt by the Egyptian priests, that we are in possession of an inscription of unusual magnitude on a granite block in Abydos. The upper half of the stone is at present wanting, but the lower part is quite legible, having been probably preserved from obliteration by having been built into some edifice in the cemetery of Abydos. The inscription is stated by Brugsch to give a general representation of the decrees of the Assyrian King, whose names and titles are completely preserved. The tablet records the visit of Shashank, king of Assyria (grandfather of the Shashank, king of Egypt, who was contemporary with the latter part of the reign of Solomon), to Thebes, and to the tomb of his son, Namurath or Nimrod (referred to in our former article), at Abydos. The king was indignant at the neglected state in which he found the temple and tomb of his son. It appears that "the Egyptian officials, who probably had little inclination for honoring the remains of an Assyrian king, had plundered, as far as they could, both the living and lifeless temple revenues which had been appointed for keeping up the grave. They were brought to an account by King Shashank, and, with the approval of the Theban god Amon, they were all punished with death" ("Egypt under the Pharaohs," vol. ii., p. 198). The inscription records the dedication of the statue of Namurath in the words, "Then his majesty had the statue, in the form of a walking man, of the Osirian great king of Assyria, the great king of kings, Namurath, brought up the river to Abydos. There were in attendance on it a large body of soldiers in many ships, no man knows their number, together with the ambassadors of the great king of Assyria. And it was set down in the splendid royal chambers of the holy of holies of the right eye of the sun, to carry the offerings on the altar-table of Nifour. According to the directions of the holy anointing, the dedication was accomplished. . . . . A memorial tablet was erected in the language of the Land of Babel, containing the command."

It will at once strike the reader familiar with the subject, that no cuneiform inscriptions corresponding with this decree have been discovered in Egypt. Nor is the explanation given by Brugsch at all unreasonable, to the effect that the Egyptians, after the departure of the Assyrian great kings, carefully destroyed all their monuments.

We thus have distinct evidence of a state of things which fully explains the fear entertained by the guardians of the tombs of the native Egyptian kings of the possible result of an Assyrian conquest. We find war actually made on the records of the dead. If the Egyptians, under the reign of Pinotem, or any of the less-known kings of the twenty-first dynasty, had actually dishonoured the temple and tomb of an Assyrian king, what more likely than the fear of reprisals on the remains of the native Egyptian sovereigns? The iconoclastic fury which disfigured such magnificent monuments as were those of the Theban kings of the eighteenth and nineteenth dynasties must have sprung from a hatred of which we see indications in this remarkably preserved inscription. It must also have been exerted by rulers of a sufficient power not to dread any popular outburst in consequence of the sacrilege. We have nothing of this kind recorded as to the accession of the Persian dynasty about 527 B.C. It is not conceivable that Cambyses would have desired to wreak his spite on the effigies of sovereigns who reigned at Thebes more than a thousand years before his day. With regard to the Assyrian kings of the twenty-second dynasty, the case was quite different. They fixed their seat at Bubastis, then for the first and only time made the capital of Egypt, no doubt with the object of keeping open the communication with their more eastern dominions. The names of these kings show their Assyrian descent,—Takelut, Tiglath, Osorkho or Sargon, Namurath or Nimrod, Shashank himself. At this time, about 930 B.C., and down to 810 B.C., there is good reason for supposing that a strong personal hatred existed between the foreign sovereigns and the priesthood, or, at all events, the personal representatives, relatives, or friends of the native dynasties. The ruthless, savage, and ferocious character of the warfare carried on by the Assyrian kings is well known. It is a record in their own inscriptions. One of the earliest dated records refers to the removal of a goddess from a temple in which she had been worshipped for more than 1,500 years. Add to this, that the special sharpness of revenge was sure to be at work, as evinced by the character of the persons accused of disrespect to the honour of Namurath. We thus have a series of indications which point very distinctly to the date of the construction of the secret gallery at Deir-el-Bahari, and to the object, as well as the occasion, of the removal to that carefully-hidden asylum of the mortal relics of the greatest sovereigns that the world has ever known. The date is fixed as to its greatest antiquity, by the presence of the relics of King Pinotem, somewhere about B.C. 1025, or of any later king who may be identified. And it is fixed, we think, no less distinctly as to its latest antiquity by the accession of the twenty-first dynasty, about B.C. 980, subject to correction from any further discoveries as to the exact dates and circumstances of the Assyrian conquest of Egypt. We thus come to a limit of forty-five years upwards and downwards, for the date of the construction and removal of the remains. No one could this have been done in a hurry. We must allow at least some six months for the excavation of the pit and gallery; and as it must have been an object with those who prepared this rock-cut sanctuary to make its existence as little known as possible, the probabilities are in favour of a considerably longer time for preparation. This may hereafter be found to agree with the period between the burial of Namurath, or rather the decree of Shashank the Elder, and the establishment of the power of Shasbank, king of Egypt, grandson of the elder Shashank, and son of Namurath. The the mutilation of the magnificent memorial statues of the Ramessid kings, and their predecessors of the eighteenth dynasty, would be indicated as a feature of the struggle, marking the predominance of the foreign invaders. It is unlikely that they would have so far outraged the religious feelings of a great mass of their new subjects after their power was established and their fury had been to some extent assuaged by the enjoyment of power. Add to this, that on the first opportunity, which we can hardly attribute to an earlier date than the accession of the twenty-third dynasty, at Tanis, about

B.C. 810, there was enough of the old national feeling dominant to lead to the careful obliteration of the inscriptions of the intrusive Assyrian dynasty, and we have a sequence of events, and a picture of human passions and sentiments, which afford a very plausible explanation of one of the *cruces* of ancient history,—the cause and the date of the mutilation of the most splendid monuments of Egypt.

INTERNATIONAL ELECTRIC EXHIBITION.

By the time that the nineteenth century had run a third of its course, the position of England as the primate of the industry of the world was established. We do not forget, although this is not the occasion to detail, what had then been done by other countries, notably by France and by America, in the ways of advancing mechanical science. But Watt, Arkwright, and Stephenson were not only representative men, but sound and honest Englishmen. Fighting, as all great benefactors of our race have had to do, against the dead-weight opposed to them, not more by ignorant than by selfish men, it was at home that their triumphs were obtained, and that, little by little, naturally, and rather in spite of, than owing to, the unintelligent action of Parliament, our vast steam factories, textile factories, railways, and steam shipping, grew to a magnitude of which it is our hope to be able to give our readers hereafter more definite ideas.

Connected with this early and autogenous growth of a new creative power was the fact that those who seized Fortune by the forelock wrought only for their own hands. Not only so, they soon began, instead of aiding, to race and to rival one another. There was no central direction, no machinery to insure the attainment by the nation of the greatest good to be derived from the welfare of the individual, no recognition of the fact that while the merchant has only to regard his relation to his fellow merchants, it is the duty of the statesman to regulate the relation of the nation to other nations, as regards its means of production and of resource, no less than its means of defence. Thus among our articles of export the very machines upon which our primacy depended formed a considerable item, the exports of machinery rising in annual value from 593 000*l.* in 1840 to 10,000,000*l.* in 1873. At the same time, our capital was freely poured out, in the shape of foreign loans, to feed the industry (or the dishonesty) of the rivals we were raising up. Our engineers for a time were much sought abroad, as more recently was the case in Japan; and there was neither disposition nor means by which a wholesome warning could be given to the nation. Our money was absorbed, our men were used, and too often ill-used. And with a rapidity which rivalled that of the spread of the railway system itself, forges, factories, mines, railways, and all the appliances of industrial science started from the soil in which we had been the first to cast the seed.

Thus we no longer hold at all events an undisputed primacy. England has not, we believe, hitherto recognised this fact. Of its truth, its magnitude, and its import, there can be but little doubt. But if anything could be calculated to bring it forcibly home to the mind of the statesman, the merchant, or the engineer, it is the fact that it is Paris, and not London, which is the scene of the International Exhibition of Electricity in the present year. It is Paris, and not London, that has first bidden the world to study, within her walls, the state of that wonderful discovery which bids fair to work even a greater industrial and physical revolution than has hitherto been accomplished by the steam-engine under all its various modes of application.

The inauguration of this important exhibition took place on the 10th of August, with all the *éclat* that could be given to it by the Government of France. The President of the Republic arrived at the scene, accompanied by ministers, in full uniform, and was received by the Minister of Posts and Telegraphs, and the President of the Exhibition Commission. The objects of the exhibition comprise even more than the wide field of the applications of electricity as a motor and illuminative power. Of this there is very much displayed. Another branch of the subject, which, as far as we have seen, has not as yet received due attention, is the application of electricity as a metallurgic and chemical power. That, no doubt will come; at present it is limited to electro-depositing. But as far as we have as yet seen, it is in the application of electricity as a means of communicating thought, and not only of sending messages by signal, by writing, or by speech, from man to man, but as echoing the voice of nature, stereotyping the indications of her meteorological action, and thus forming a wholly new and exhaustively instructive means of direct communication between nature and man, as well as between man and man, that the Exhibition of 1881 offers the most wonderful instances of the natural magic of science.

The great hall of the Palace of the Exhibition is a masonry building, 250 mètres in length by 100 mètres in width. Lofty iron pillars support a semicircular arched roof of glass; they are 8 mètres apart, and carry galleries, the spaces under which contain steam-engines, boilers, and dynamical apparatus. A set of four large Belleville boilers, which are heated by coal-dust, supply 16,000 lb. of steam per hour, or a force equal to 800-h p. nominal. There are also Otto gas-engines to the extent of 200-h.p. more. This is the provision made by the French syndicate, which supplies motor-power for a charge of 33 per cent. on the night receipts. French, English, and Belgian manufacturers have also provided many more steam-engines and gas-engines for use by private contract.

Among the English exhibitors the Brush Light Company is the first in the field. Their motor-power is supplied by seven Robey engines, having an aggregate of 137-horse power. Seventeen machines are fixed on concrete foundations, sixteen being used for illumination and one for the chemical service of electro-plating. One of the arc-light generators sustains sixteen lights, another forty, of 2,000 candle-power each; and one of the same pattern as the last, but differently applied, produces a single light of 150,000 candle-power! This is three times the power of the first-class lighthouse light contributed by the French Minister of Public Works! In addition to the above is a machine sustaining six lights of 3,000 candles each, another of six lights of 6,000 candles each, a one-light machine of 1,500, and a one-light machine of 50,000, candles.

Among incandescent lamps is a one-light machine of 3,000, and another of 50,000, candles on the Lane-Fox system, and four of 50,000 each on the Swan system. The large space under the eastern gallery is lighted by the same company with fifty-six lamps of 2,000 candles each; and the internal façade of the great hall is illumined by the same enterprising company.

The Gramme, Lontin, Siemens, Meritens, and other systems are displayed by the French Syndicate, and this part of the exhibition is remarkable for the elegance of form given to the lamps. The Edison lights occupy two *salons*, and are more particularly to be regarded as competing with gas for domestic illumination. Five hundred small incandescent lights are maintained by four small dynamo-electric machines driven by a 35-h.p. steam-engine. The greatest effort of this inventor is displayed in a combined steam-engine and generator of 150-h.p. on one bed-plate. This is to maintain 700 lamps on the great staircase, 500 more in the refreshment-rooms, 500 in one of the external gardens, and 500 in a theatre on the other side of the Champs Elysées. The weight of this monstrous development of the flint and steel of our boyhood is 17 tons. The magnets weigh between six and seven tons, and the armature, of 50 hundredweight, will make 350 revolutions in a minute. Its power is said to be adequate to maintain 1,200 lamps of 16-candle power, or 2,500 10-candle lamps.

A Siemens electrical machine, worked by an overhead conductor, is in course of erection between the Place de la Concorde and the eastern entrance of the Palace. It is intended to draw the ordinary street tram-cars by electric power. It is probable that a good scientic fight will be maintained between the advocates of this apparatus and those of the application of Faure's accumulator to the purpose of street traffic. Each of these methods, it seems to us, has its appropriate future. The erection of posts, wires, and overhead communications in a city, is, we take it, an offence against civilisation itself. For railway urban communication we have before expressed the anticipation that Mr. Siemens has a great future before him. For roadway communication, if the promises made by the *La Force et la Lumière* Company be carried out, we confess that our sympathy is with them. Forty of their 50-lb. cells are said to be capable of propelling an omnibus containing twenty-four passengers for three hours, and the cost of recharging a battery is stated to be 2½d., with the expectation of a reduction. We think that very little has yet been communicated to the public as to the secret of the Faure battery, and that a brief explanation of its principle of action will be acceptable to our readers.

In the store-cell of M. Faure, the attraction of chemical affinity is subtly balanced against mechanical force. The materials employed are, lead and that remarkable mixture of equal parts of the protoxide and sesquioxide of lead which, as first procured from a red earth occurring on the banks of that Spanish river to which the Romans gave the name of the Minius, is called Minium. This compound body is easily induced to act in a double way,—drawing in more oxygen to the under-oxidised constituent, and giving forth oxygen from its more fully oxidised element. It is here that the essential difference between the Faure battery and the Leyden battery is found. The latter, whatever its power, is instantaneously and wholly discharged when connexion is made between the poles. The latter is susceptible of gradual and controllable discharge.

The form of this battery is that of two plates of lead, each of which is coated with minium, covered with porous felt, and rolled in a spiral scroll. The two scrolls are placed side by side in a vessel of acidulated water, a strip of lead being left projecting to allow of the completion of the metallic circuit. When these strips are brought into communication with the wires of a battery, or dynamo-machine, a chemical action begins. The red lead on the plate at the positive end of the battery becomes more highly charged with oxygen, and its under-oxidised portion is converted into a peroxide. At the same time the more highly-oxidised element in the plate connected with the negative pole is reduced to the state of pure metallic unoxidised lead. This action continues until all the red lead on the one plate has been fully oxidised, when the battery is said to be charged. If the couple of leaden strips be now connected so as to form a circuit of their own, without any exciter of electricity being included, the reverse action sets in. A current of voltaic electricity is excited, and flows in the return direction, oxidising the metallic lead on the negative plate, by the oxygen which escapes from the overcharged coating of the positive plate. Thus the dynamic energy is reversed, the static chemical force is released, and a power is made available which can be gradually drawn off for the purposes of motor force. We are not aware that any good account of this delicate apparatus has been hitherto given to the public in this country, except in a short and admirable article in the July number of the *Edinburgh Review*.

THE FATAL RAILWAY COLLISION AT BLACKBURN.

It will be within the remembrance of many of our readers that, on repeated occasions, when railway inspectors and juries sitting on railway fatalities have been urgent as to the provisions of brakes that could bring a train to a standstill within comparatively a few yards, we have pointed out that a new source of danger might possibly lurk in this effort to secure greater safety. Not that we at all undervalued the importance of providing every train with an appliance which, under certain circumstances, might prevent very terrible disaster. But we foresaw that there was a dilemma to be feared, in consequence of the introduction of automatic, or very powerful, brakes. If this appliance were reserved for use in time of danger, there was the risk of its having got out of order, and thus being inapplicable when required. If, on the other hand, it were used for the ordinary working of the train, not only was there the risk of throwing an unnecessarily destructive stress both on vehicles and on the permanent way, but the possible danger incurred was even more serious, from our point of view, than the increase of cost. For the application of a brake that would bring up a train in its own length to the purpose of that gradual stoppage on nearing a station to which we have been accustomed, was hardly to be anticipated. Nor would such a use of the apparatus altogether guarantee its efficiency under stress. It was, therefore, to be feared that the engine-driver would drift into the practice of running at full speed to within a very short

distance of the stations, relying on the great brake-power to bring him up. In this case, from our point of view, a great and unnecessary risk would be incurred in the working of every line when the brakes were thus used,—a risk that would increase as the wear and tear of working rendered the appliances more liable to get out of order.

The truth of this view has been fatally proved by the catastrophe at Blackburn Station on the 8th of August. The Liverpool train reaching Blackburn at 3.6 p.m. brings a number of passengers from Scotland in a Midland composite carriage, which is detached from that train and attached to the Manchester express at that station. On the 8th, the Liverpool train duly arrived, and took up its proper place on the up-line at the further end of the station. An engine was also in waiting to shunt the composite carriage from one train to the other. All seems to have been in order, when suddenly the Manchester express dashed at full speed into the station. The accounts published all agree in the incredible statement that it was the intention of the engine-driver to stop the train by the Westinghouse brake within twenty or thirty yards of the station. We trust that it will turn out that this is a gross exaggeration. The train was approaching the station, not under steam, but under the influence of gravity. At whatever speed it was running, and wherever it was attempted to apply the brakes, the latter failed to act. According to the evidence of one passenger, there had been a jolting in the train during the journey on the former occasions on which the brakes had been applied, which indicated that something was out of order. It is quite possible that the engine-driver, standing on the foot-plate of a ponderous engine, might have been unaware of such a significant warning. But of what use are guards in running trains, if they do not call the attention of the driver to a symptom of danger of so serious a nature?

We trust that the mechanical details of the case will be fully brought out at the inquest, for which, unfortunately, there will be but too much occasion. The weight of the engine and tender, the number and weight of the carriages in the train, the speed of running, the point at which, according to the regulations of the company, it was proper to put on the brakes, should all be definitively ascertained. It should be remembered that the velocity of thirty miles an hour is equal to 44 ft. per second. We may take 166 tons as an approximate weight for train and engine. The force developed by that weight at that speed is 7,304 foot tons, and such would be the dynamical value of the blow given on a sudden stoppage of the train. To propose to effect this within the length of the train itself, except on occasions of the most urgent and obvious danger, is to incur a risk of a frightful nature. On this occasion, too, it was shown that the force of impact may be transmitted through an intermediate body, to a third body, which will then be propelled almost like a ball from a gun. The Manchester engine, striking the shunting engine, caused and inflicted such mutual damage that the two ponderous machines were locked together, and held down to the ground. But the force of the blow was transmitted to the carriage attached to the shunting engine. It is not stated whether this was coupled or not. In the former case the coupling-iron must have been broken by the shock. In any case the carriage was shot forward on the rails by the force of the blow, and propelled into the Liverpool train, of which it wrecked four of the carriages, with fatal and destructive results to numerous passengers.

The collision is one, as far as our memory may be trusted, of an unprecedented kind. The action of a single carriage as a sort of projectile has never, we think, been so frightfully illustrated. The points to which the circumstances of the case call the attention of the engineer are the effects of the difference in weight of the locomotive and the other vehicles in the train, and the importance of keeping the controlling power attached to the heaviest body in the moving mass. The short distance within which the trains of the Metropolitan Railway are brought to rest from a very rapid speed is due to the great comparative weight of the engines, and the application of brake power to this controlling weight, as well as to dragging the train. The Metropolitan engines were designed with this view. The cost of such sudden and numerous stoppages is very great, and wear and tear of engines and vehicles, as well as of permanent way, is proportionately heavy, as compared with other lines. But there was no choice for the engineer in this case. Unless the stoppages and startings could have been made almost immediate, only an omnibus rate of speed could have been obtained on the underground line. As it is, the speed between the termini is brought down to something like 12 or 14 miles an hour, while the running speed is as high as 45 miles an hour. Here, then, was a special problem, which was ably solved by the engineer of the line. But to take the mode of working which, though disadvantageous, was necessary in this particular case, and to apply it to a trunk line conveying long and heavy trains, and with stations at ordinary distances apart, is a plagiarism of an indefensible kind, likely to be attended with fatal consequences. In the present case, such consequences resulted. Whatever be the detailed replies to be elicited to the important questions that we have above indicated, this much seems sure. It was the habit on this railway to approach an important station without a proper retardation of speed, relying on the use of powerful and destructive brakes for the safety of life and limb. We do not hesitate to say that this should be directly prohibited, and that by Act of Parliament, if the power of the Board of Trade be insufficient to deal with the evil. The railway companies allege that the speed at which they travel is demanded by the public. No investigation, however, has been made on this point. Nor do we think that the public would be prepared to purchase a slight saving in time on a long journey at the cost of personal risk in approaching every station. Such a risk we pointed out as likely to occur from placing too much reliance on the brake. Unfortunately our warning has proved too true. We take the occasion of repeating it, and of accentuating the repetition by calling attention to the fact that for every 10,000 or 20,000 miles run by carriages fitted with complex brake apparatus the chance of disorder or wear in that apparatus will increase. Of course, it will increase in proportion to the number of times that stress is thrown upon the apparatus, as well as in proportion to the mileage run. Whatever precautions, then, may be necessary, in order to insure the readiness of powerful brakes to act in case of danger, their use, in the ordinary traffic, for very rapid arrest of the motion of the trains, should be altogether prohibited.

ALFRED W. MORANT, M. INST. C.E., F.S.A., F.G.S.

The death of Mr. Morant, Borough Engineer to the Corporation of Leeds, occurred about one o'clock on Thursday morning, the 28th of July, at his residence, 33, Virginia-road, Leeds. For some months his health had been in a very unsatisfactory state, when about the middle of June, availing himself of a fortnight's holiday, he visited Bridlington; returned greatly refreshed, and feeling himself equal to the task, went to Birmingham for the 7th, 8th, and 9th, to hand over to his successor the Presidency of the Association of Municipal and Sanitary Engineers and Surveyors, which he had held for the customary twelvemonth; returned home greatly fatigued; and showing symptoms of a complicated character, he became confined to his bed, where for a fortnight he patiently endured the progress of the disease, the result of an attack of diabetes about seventeen years previously, which has apparently been gradually undermining his otherwise strong constitution.

Mr. Morant was the eldest son of a second family of George Morant, of Old Bond-street and Wimpole-street, not only a highly-esteemed Decorator, during the best part of the first half of the present century, but a great encourager of art; he was, with his eldest son, George John Morant, on the first Council of the "Art-Union of London." Augustus, Alfred's younger brother, was educated to the profession of architecture, and died early in life; a notice of him appeared in our volume for 1863. Morant, born 17th May, 1828, was, after the usual school education, placed as a pupil for five years (1845-50) with the late Mr. James Simpson, past-president of the Institution of Civil Engineers, and thus was enabled to obtain thorough practical experience in such extensive undertakings as the large waterworks at Liverpool, Newcastle-on-Tyne, York, Bristol, Carlisle, and many other places, besides the Hartlepool Docks, Southend pier, &c. He then served five years (1850-55) as assistant engineer to Mr. J. G. Lynde, who was at that time engaged on Parliamentary and other work, acting for him in surveying and in charge of works, especially as resident engineer during the construction of the water-works at Great Yarmouth and at Lowestoft. They were completed in 1855. Mr. Morant was appointed, February 14, 1856, surveyor to the Corporation of Great Yarmouth, as well as to the Local Board of Health. He continued to perform the duties of the offices for about eight years, during which period he designed and carried out a Sea-wall and Marine Parade extending the entire frontage of the town, for more than two miles from north to south; developments and improvements of the general drainage system of the borough; superintending the very large Corporation estates, comprising nearly all the modern town, and also laid out for building a portion of their estate in the North Denes; he also made a detailed map of the estates, and with the Town Clerk prepared the reference-book and rent-roll, a work of great labour, but giving great satisfaction. He introduced most important improvements in the system of scavenging, road-making, repairing, watering, &c., and other official trusts. One of the first works carried out in Yarmouth by Morant was the laying-out of the new cemetery for the Cemetery Committee, together with the boundary walls, gates, &c. He was also elected surveyor to the trustees of the Children's Hospital (usually styled the Charity Trustees), for whom he made a map showing clearly their two or three hundred properties and buildings, with abuttals, &c., and to some extent developed their estates. As surveyor to the Victoria Building Company, the owners of a large tract of land at the south end of the town, acquired from the Corporation, Morant laid out the bulk of that estate, forming the roads, drainage, &c., and in some instances prepared designs for the buildings to be erected thereon, being allowed by the terms of his appointment to carry on private practice. His most important engineering work was the design and superintendence of the Britannia Pier, for a local company. This is a substantial timber structure 750 ft. in length, the head of which is 60 ft. in diameter, and in about 35 ft. depth of water and a height of about 16 ft. above high water; the general width is 24 ft.; under the head is a fishing platform. The cost, including the Act of Parliament, was about 6,000*l.*, and it was erected in about nine months, being opened in July, 1858. He carried out the completion of Britannia Terrace, a range of first-class houses facing the Parade; designed the Sailors' Home, new Record and Muniment Rooms, &c., at the Town-hall; large additions to the Great Yarmouth Workhouse; and many schools, villas, terraces, warehouse and business premises in the town and neighbourhood. With a mind peculiarly fitted by nature and study for archæological subjects, he carried out restorations to various churches, including those of Ormsby, Runham, Postwick, Witton, and Blundeston, and he also acted, until he left Yarmouth, as resident architect to the Committee for the Restoration of St. Nicholas Church, in conjunction with Mr. John P. Seddon; and he rendered valuable assistance to the late Mr. J. H. Hakewill, the architect of St. John's Church.

At the end of 1862, he was seized, whilst surveying, with the first symptoms of diabetes; this compelled him to send in his resignation, but so satisfied was the Corporation with his services, and so highly was he esteemed by the members individually, that a resolution was passed to keep open the office for a twelvemonth, the duties being performed by one of his assistants. Nevertheless, he prudently sold the extensive library of professional, antiquarian, and heraldic publications which he had collected in so great a number as eventually to require the erection of a room for their reception, and, breaking up his establishment, went over to Ireland for a thorough change, expecting to return (if at all) in a fortnight; but finding himself greatly benefited he stayed for about six weeks, seeing every place which he could reach by the railways. He then visited Norwich, when, finding his health sufficiently restored, he determined to stay there, and finally resigned his appointment at Great Yarmouth in November, 1864. In March, 1865, the Corporation at Norwich honoured him with the appointment of City Engineer, and from that time until towards the end of 1872 he was engaged in their service, performing all the duties appertaining to the office single-handed. He designed and carried out, between August, 1868, to the end of 1870, a complete system of high and low level inter-

cepting sewers, nearly all of which were built in tunnels excavated at depths varying from 20 ft. to 80 ft. below the surface. From the peculiar nature of the soil, and from the necessity of a portion of the sewers,—namely, about four and a quarter miles,—being required to be built many feet below the level of the springs, the undertaking became a work of great difficulty and hazard; the quantity of water met with in the excavations was so large that for a long time the steam-engines were pumping day and night, raising twenty million gallons per day. It was seen that the marsh land on the opposite side of the river was cracked, and on examination it was found that it was drained 9 ft. below the level of the water in the river; while also the wells were lowered, and stand-pipes, &c., had to be set up for a water supply to the inhabitants. In consequence of the failure of the contractor very shortly after the commencement of the works, Mr. Morant undertook the contractor's work on behalf of the Corporation, and it devolved upon him to employ men, purchase materials, and to personally arrange and superintend all details to the completion of the works. This entailed night service in addition to the daily duties of his other departments, at a salary of 400*l.* per annum! The sewage requirements involved the erection of a large pumping station at Trowse, at the lower end of the town, costing about 15,000*l.*, with a rising main to a farm situated on a high level at Kirby and Whitlingham, about three miles from the market-place, and consisting of 1,300 acres, of which about 100 acres were prepared by him for irrigation with the sewage. He formed a self-acting system arranged upon Bateman's "leaping weir," by which in storms the flood-waters would flow into the river. Added to these works, he had to find out all the property undrained, and to connect the various houses with the sewers. A description of this extensive and laborious undertaking was communicated to the journal *Engineering* of October 21, 1870, vol. x., pp. 297-8, through a friend who had inspected some portions of the works during progress, for Morant was always averse to putting his own merits into print; and, though often requested, could never undertake to write a scientific description of the scheme. He also acted as sanitary officer to the Board of Health, "giving his cheerful and untiring attention to the duties devolving upon him during the terrible scourge (small-pox with English cholera) in 1871." Amongst his private professional works, he designed a mausoleum for Dr. Cooper, in which that gentleman was buried in 1878, in a suit of black clothes, &c., as directed in his will.

In December, 1872, he was persuaded by his friends to compete for the office of borough engineer and surveyor to the Corporation at Leeds, the salary offered being 600*l.* per annum; this he eventually obtained. Having, therefore, necessarily to remove, he sold to the Leeds Corporation, for the newly-established city library, the bulk of the library which he had again collected at Norwich, and for which he had again built a large room, attached to the additions at first made by him to a small villa situated in Plumstead-road, outside the city, taking the remainder of the books with him to his new residence. The Sewage Works at Knostrop, designed in 1872 by Mr. Thomas Wilson, engineer to the A B C Company, in conjunction with Mr. A. M. Fowler, at that time Borough Surveyor of Leeds, had been commenced, but only included a small part of the works as now in operation. All the special fittings and appliances, so as to enable the works to be used for any of the various systems tried, the tramways, drying-sheds and machinery, offices, workmen's cottages, and the large settling-pond, were carried out by Mr. Morant, who erected at Burmantofts and Armley-road two of Fryer's patent refuse-destructors at a cost of about 4,500*l.* each. The "Minutes of the Proceedings of Municipal and Sanitary Engineers, 1876," contain Morant's "Description of the Leeds Sewage Works, and of the Various Processes which have been tried for the Purification of the Sewage," which was also published as a pamphlet of twenty pages. The systems of Drainage for Headingley and Meanwood, involving a tunnel 2,350 ft. in length, were carried out in 1877. That of Chapel Allerton, Moor Allerton, and Roundhay, Bramley, and Kirkstall required three crossings of the river Aire by inverted syphons, once over the Leeds and Liverpool Canal by a pipe bridge, and tunnelling under the Kirkstall Railway Station of the Midland Railway. The Hunslet low-level sewer required syphons under the Canal and River Aire and under the Midland Railway by a syphon. In connexion with the widening of the drainage areas, the necessity arose for larger sewers or other means of getting rid of the storm-waters. This Mr. Morant met by constructing storm overflows at all available points, and of various types; a "leaping weir" is so formed that the normal flow drops into the main sewer, but when exceptional in quantity it leaps the opening and flows down the overflow. This instance of its use, with that at Norwich, is believed to be the first in sewage works. The ventilation of sewers was strongly advocated by Mr. Morant both at Norwich and at Leeds. A few ventilators had been tried at Leeds, but great complaints were made regarding the smell. These he met by making more openings, and thus causing a greater circulation in the sewers of fresh air; the result being almost unqualified success, the complaints became few, and, when investigated, usually proved to have a local cause. In Morant's "Inaugural address," as president of the association above mentioned, he referred to the expenditure upon works affecting the health of the town amounting to 1,829,000*l.*, which he considered was money well spent, as the death-rate had considerably decreased. In one year seventeen miles of sewer works had been constructed, the total length of the sewers within the borough being then 187 miles, all of which were freely ventilated by means of open gratings and gullies, of which there are now about 20,000. At an inquiry held at Exeter a few weeks since, Mr. Robert Rawlinson, C.B., stated that "the sewers of Leeds are better ventilated than those of any town in England." The "Address" above referred to has been stated to be a most able exposition of engineering and sanitary science with reference to the departments connected with the Leeds Corporation, and was published in 1880 as a pamphlet of seventeen pages, and also in the *Leeds Mercury* of the 28th of May, 1880.

The Kirkgate Market extension, 1875—1879, consists of the fish-market, 2,200 ft. long by 50 ft. wide, with brick walls and arched iron roof, and under it a complete system of ice and fish cellars. Ninety shops in blocks of six each, a row of eleven wholesale shops, and two rows of five each, either wholesale or retail; a market for eggs and butter; an open square for garden produce; with residence and weigh-office, covered pig-market, open hay and straw market, and a new gallery with shops round the existing covered market, the whole costing about 50,000*l.* The principal street improvements carried out under Morant's directions are School-close, East-street, York-street, Domestic-street, Strut-lane, Hunslet-lane, Hunslet-road, and Swingate. He took an especial interest in the By-laws for Buildings, which had to be altered occasionally to meet the growing requirements of the borough; they were rigorously enforced. An improvement as regards paving due to him is that of making the foot-paving level with the road-paving at all crossings. He laid out and formed the roads and drainage of the Roundhay Park estate, arranging the lots for sale, erecting the lodges, &c., at a cost of at least 30,000*l.*, with later the new entrance, at a cost of 2,000*l.*; and widened, in 1872-3, the Wellington Bridge, a stone structure, originally designed by Thomas Telford, of one arch 100 ft. span, by building abutments 7 ft. in width on one side, and 14 ft. on the other; turning similar arches to that already executed, so as not to deviate from the original design, "a ticklish job," as he wrote, "the small width of 7 ft. being insufficient to give lateral stability; but I tied it in well." The bridge carrying the same road over the Leeds and Liverpool canal, was also widened at the same time; and the School Close Bridge, of brick, about 40 ft. span, partly on the skew, and springing below the water level, was carried out in 1875-76. The principal buildings are the police-stations at Sheepscar, 2,000*l.* (with branch library), Millgarth-street, Hunslet-road, 1,000*l.*; the Millgarth-street mortuary, several smaller police-stations, and plans for fire-brigade stations on various sites; with the re-plastering and decoration, with coloured tiles, for 6 ft. from the ground to all the corridors, and the granite lining to the vestibule, of the Town-hall, the original plastering having rotted from having been painted before it was dry; the ventilation of the Law Courts,—and it was by his strong recommendation, and under his superintendence, that Mr. Tobin first applied about 1874, his principle of ventilation to the police-court, effecting a thorough purification of the atmosphere without a draught, and rescuing its character from being the foulest court in England. In 1878, the large fountain he had erected in the market, was removed (1880) by him to the area in front of the Town-hall, involving the removal to one side of the area of the bronze statue of the Duke of Wellington. The central part of the fountain was first placed on rockwork, which has lately been removed, and the fountain lowered. He provided the platforms, galleries, &c., for the great Liberal demonstration of the 14th November, 1879, each to hold 1,000 persons, in a large engineering-shed, capable of holding 18,000 persons.

His latest work, and one now in progress, is the new road from Kirkstall-road to Armley. It consists of a brick and stone bridge, with two arches, each 41 ft. span and 45 ft. on the skew, over the river Aire; a viaduct of fourteen arches, each 26 ft. span; a retaining wall, 50 ft. in height, and outside a radius of 90 ft.; with an iron trussed bridge of 60 ft. span over the Leeds and Liverpool Canal. The difficulty of the work has been greatly enhanced by the great difference of 35 ft. in the levels of the river and of the canal, which are only thirty yards apart. When completed the gradients will be 1 in 32 and 1 in 77. The works are well advanced, the iron bridge being now in use. Among many of the schemes in contemplation, which had occupied his attention were,—a central fire-engine establishment and barrack, at an estimated cost of about 7,000*l.*; baths and washhouses, for about 10,000*l.*; and an abattoir; for in 1879 he attended a deputation on the occasion of its visit of inspection of those at Newcastle-on-Tyne, Berwick-upon-Tweed, Edinburgh, Dundee, Aberdeen, and Glasgow.

An anecdote, which Morant often mentioned, well illustrates his courage on an emergency. During the spring of 1879, a very cold one, he had to keep at work several hundred men in distress who were employed at small wages in road-making or anything else. One day seventy of them, being dissatified, went in a body to the town-hall and demanded to see the mayor, who deputed the borough engineer to meet them. He at once walked into their midst, asked for their spokesman, heard what they had to say, and sent them back to work. "By going right at them I got off all right, and they behaved very fairly; had I spoken from a staircase there would have been a row, but showing no fear satisfied them better." In 1877 Morant applied for a modest increase to his salary to 800*l.* per annum; and, as a proof of the high appreciation of his services and of the faithful discharge of his duties, the town council granted it without a dissentient voice.

These details of Morant's professional practice are, through the kindness of friends, the best obtainable. His varied labours, in leisure hours, in archæology and heraldry will now be described. His cousin, the late Mr. John W. Papworth, was from about 1845 engaged in the preparation of the now standard work, "The Ordinary of British Armorials." Morant, calling upon him, could not be idle, even in those early days: so while chatting, usually assisted him in cutting up and sorting the constantly-accumulating materials. Taken, or "bitten," as one may say, with the, to him, novel and interesting subject, he studied heraldry thoroughly, and taking up the severer and little known branch of foreign heraldry, prepared a "Dictionary" and an "Ordinary" on a corresponding plan, by purchasing books extensively and borrowing others relating to the subject, in the French, Italian, Spanish, German, and Dutch languages, and continued its formation up to the time of his death. Then about 1868-1871 he took Reitstap's "Armorial Général," published in 1861, a European "Burke's General Armory," and in a similar manner as done by Mr. Papworth, transposed it into a European Ordinary, as a parallel work with his first great manuscripts. These undertakings, always at the service of his friends, are comprised in a few words, but they convey no idea of the immensity of labour, care, and attention, in classification and arrangement, during a succession of years, performed by one mind without assistance. They, together with his continued entries into an interleaved copy of "Papworth's Ordinary," form a monument of industry and patient labour, and might have satisfied a reasonable person as a life's work.

Early in 1852 he translated the French text, and arranged the illustrations, for the two articles "Hipknob" and "Ridge," for the Architectural Publication Society, and to the "Dictionary" in later years he always willingly afforded the results of his experience. He drew out and published, 1854, "Sectional View of a First-rate Line-of-battle Ship with Screw Propeller." Joining the volunteer movement at its commencement, he rose to be Lieutenant of the 1st Norfolk Artillery Volunteer Corps (a Yarmouth corps), during which time he thoroughly investigated the subject of artillery, and delivered two lectures at the Corn-hall on the subject of "Ancient and Modern Guns," which were illustrated by very numerous diagrams specially prepared by himself showing the development of artillery from the earliest period. He took great pains that these illustrations, and the information given, should be accurate, and though the subject was necessarily technical, the attendances were good and the lectures highly appreciated. The corps rose to a high position, and it was with great glee and some complaint that on a certain day, practising with the great gun at a mark three miles off in the sea, it was destroyed at the first shot, and the day's duties in that respect put an end to. At Norwich, he joined the corps as an officer, and prepared and printed, in 1870, for the instruction of his men, a sheet showing the whole construction and nomenclature of a nine-pounder gun, its carriage, its limber, the shells, tubes, and line of firing. His men received high commendation from the inspecting officer at the examination following. As an enthusiastic student of Mediæval antiquities, he formed an "Archæological Chart" of Mediæval Art in England some 20 ft. long and 3 ft. wide, filled with tracings of the best examples. This was commenced at Great Yarmouth, and completed, if it could be so stated, of a work to which he was always adding, at Norwich. This gave him the foundation for a series of papers which were first printed in 1853, and enlarged and printed in 1870, in the *Architect* journal, entitled "Indications of Date"; they were reprinted as a pamphlet of forty-four pages.

After the decease of Mr. Papworth in 1870, numerous inquiries from the subscribers to his "Ordinary of British Armorials," as to the completion of that work, the printing of which had been commenced in 1857, induced a proposal from Mr. Morant to share with Mr. Wyatt Papworth in the publication of the remainder of the manuscript. This being arranged he took it in hand, and not only revised the unpublished portion of the manuscript for the press, but also added to it the materials left by Mr. Papworth, with extensive additions from the numerous sources in his own collection. This "labour of love," comprising 430 closely-printed pages, was completed faithfully and successfully in 1874. "As to giving up a thing when I once undertake it, no reasonable amount of trouble would ever make me do this," is one of the passages in an early letter on the subject, while adverting to his onerous professional duties preventing his progress being so rapid as he had desired.

Besides a large collection of tracings of constructions, and note-books for professional reference, there may be noticed amongst Morant's manuscripts and illustrated papers,—collections made by himself of monastic seals, of arms and armour, the peerages of Scotland and Ireland, Lord Mayors of London, various rolls of arms, and many other books too numerous to be more than noticed here, but proving his unremitting industry. His numerous additions to his copy of Burke's "General Armory" were gladly used in the new edition of 1879, as acknowledged by its editor and author. He has heavily noted "The Grammar of Heraldry" both with descriptions and illustrations. The "Glossary of Architecture" was even not neglected; and the last work he commenced in 1880, and was at work upon within a month of his death, was entering additional coats-of-arms into his interleaved copy of the new edition of Burke's "General Armory,"—"a very laborious job," as he himself describes it.

He occasionally complied with the wishes of local friends in preparing papers on antiquarian subjects. Among these may be named:—For the Norfolk and Norwich Archæological Society he wrote "Notices of the Church of St. Nicholas, Great Yarmouth"; communicated a paper by the late Rev. E. S. Taylor, entitled "Notice of Roman Coins and Antiquities found at Caistor-next-Yarmouth"; and, with Mr. J. L'Estrange, "Notices of the Church at Randworth." He made a plan of Skipton Castle, and from his personal examination supplied various details shown for the first time, on the occasion of the excursion in 1877 of the Yorkshire Archæological and Topographical Association; a paper "On the Abbey of Bury St. Edmund's," for the British Archæological Institution meeting in 1869 in that town; and in 1879 a paper on Kirkstall Abbey is also mentioned. He edited the third edition (1878) of Whitaker's "History and Antiquities of the Deanery of Craven," visiting all the places named, thoroughly revising the text, copying inscriptions and armorial bearings, obtaining additional information of the family genealogies, inserting additional plans and views, in a complete manner, and entirely to the satisfaction of the publisher, Mr. Dodgson, of Leeds, for whom also he edited the latest edition of the "Guide to Leeds," for 1879. He has formed a very nearly perfect collection of casts of monastic seals, and of army and navy medals, Greek and Roman coins, while many Mediæval antiquities also came within the scope of his treasures.

Mr. Morant was highly respected and esteemed in all the towns in which he had resided, not only in his official positions, but for his private worth and intellectual attainments. He thoroughly mastered the details of all the schemes and plans which he had to propose or to carry into execution. He was a good scholar in most matters antiquarian and archæological, painstaking and conscientious in his researches, most zealous in collecting information, and as ready to impart it. "As an authority in genealogical matters, on archæological buildings, and antiquarian subjects generally, he stood as one of the most eminent in Yorkshire," is the statement of one who had seen little of him, but had heard much. He was liberal to a fault, perhaps. To say he was never idle would convey a poor impression. He worked at his professional duties and for his pleasures day and night. Up at his desk by daylight, or out on his inspection duties at the water or sewage works at any time of the night, or writing during the evening and until the small hours of the morn, was his constant practice for many years. Even the partial failure of his left eye early in 1872 caused no cessation of work; the complaint of his family was, that they saw little of him unless they remained quiet in his library, where he was working surrounded by his books and papers. Even his "pleasure trips" for rest, and health, and ease to his eyes, were hurried journeys in the endeavour to see all that he could in the time. In April, 1875, to "give a few days' rest to head and eyes, which are so bad," he went to Ripon, and looked through the cathedral from the crypt upwards; next day to Studley Park and Fountains Abbey; next day over Richmond Castle and Easby Abbey; then on to Whitby, stopping there for three or four days. "You seem amused," he wrote, "at my going about sightseeing *for rest*, but can you imagine me absolutely resting? I could not do it; the change of scenery and freedom from compulsory work is the great thing." In August, having to visit the Yorkshire quarries, he visited Hartlepool, Sunderland, Durham, Newcastle, Tynemouth Priory, Warkworth Castle, Hexham, Carlisle, and back in a week. "Pretty good, was it not?" as he concludes his letter describing what he had seen. In August, 1879, he paid a visit to Yarmouth and Norwich for a real holiday, being, this time, "bent solely on quiet and fresh air," and wrote that the "visit was most delightful; I saw so many old friends who were kind beyond my expectations."

Morant was elected an Associate of the Institution of Civil Engineers on 7th February, 1854, and transferred to the class of members on 29th July, 1878; elected a member of the Geological Society in 1854; and a member of the Society of Antiquaries, 17th July, 1861. For a year he was vice-president of the Leeds Architectural Association, and, 1880 81, president of the Municipal Engineers and Surveyor's Association as above stated. He married young, and leaves a widow, three sons, and six daughters. He was buried on Monday, 1st August, in Woodhouse-lane Cemetery, at Leeds. The funeral *cortège* comprised, besides members of his family and friends, the Mayor, several of the councillors, and other gentlemen officially and socially connected with the deceased. It was met at the cemetery by nearly the whole of the members of the Corporation, members of the School Board, the Borough Coroner, officials from all the departmental offices of the Corporation, representatives of the building and other trades holding contracts under the Council, and a large number of local private friends. The coffin, which was of polished oak, was borne into the chapel and to the grave by four workmen as we understood at their own request. The tomb will be an offering from the assistants and others in his office.

WYATT PAPWORTH.

PARLIAMENT ON THE MUSEUMS.

LAST week, as we have already briefly said, there occurred one of those occasional fits of interest in matters relating to art which are not over-frequent in the House of Commons. It arose *apropos* of the consideration of the Education Estimates, in regard to which Mr. Mundella made a lengthy statement, bristling with figures and statistics. None of these, however, bore any relation to the part played by art-teaching in our educational system, and it was perhaps partly to supply this gap that Mr. Collings proceeded to call attention to the importance of rendering aids to the study of art more accessible in the provinces, and not confining the voting of public money for museums and art-galleries to the three capitals,—London, Edinburgh, and Dublin. This question of the centralisation of art-museums, and its advantages and disadvantages, is a difficult one which is every now and then brought to the front again, as one or another member for a provincial constituency is moved with the feeling of his responsibility for the artistic culture of his constituents. The general tendency of Mr. Collings's speech was in favour of making money grants on behalf of the art-museums of provincial towns, instead of leaving them to find the funds for such institutions out of their rates. The amount of public money spent on such objects in London he considered was regarded in the provinces as out of all proportion to any benefit which the provincial artisan, who might get a day or two in London once in a twelvemonth, could derive from these great Metropolitan museums, and he warned the House in somewhat solemn tones that the provincial populations would not much longer be content with the crumbs which fell from the rich table in London. He also strongly urged the appointment of a permanent Minister of Public Instruction or Minister of Education, who should supervise all such institutions, and their working and expenditure, in a broad public spirit. Mr. Slagg, seconding the proposal, dwelt also on what might be done for the provinces by means of reproductions of original objects: a method of spreading artistic education which, we need hardly remind our readers, has already been to some extent made use of by the South Kensington authorities. Mr. Ecroyd followed in support. Mr. Maskelyne deprecated the idea of voting public money for any but central museums, asking where the line was to be drawn between towns which were thus to be subsidised and those which were to be denied: a somewhat pertinent question. Mr. Caine took another line, and while strongly upholding the claims of provincial towns to greater facilities in the study of art, believed that this might be much better accomplished by a system of lending and temporary distribution of objects belonging to central museums by circulation throughout the principal local ones. He considered the British Museum should have power to lend their objects, and suggested that it was believed there were a number of Turner drawings in the National Gallery hidden away out of sight for want of space to exhibit them, which might very well be lent to some principal provincial town, such as Liverpool, where they might be very glad to have them and to exhibit them. Mr. G. Howard averred that the Turner drawings referred to were more easily accessible than was supposed,—that they were so stored as to be easily examined on proper application, and that the National Gallery authorities cultivated a liberal spirit, and had recently recommended the loan of pictures to provincial galleries. Mr. Magniac took wider ground than any previous speaker; he would prefer to see the proposition they were discussing set aside for the present, in the hope that before long a large measure of reform would be passed, and that all the three great central institutions in London would be brought under one governing head and compelled to work to one end. The first thing such a governing authority should do would be to classify all the treasures in our three museums; not to leave engravings at the British Museum and pictures at the National Gallery,

but to bring together into one building the classes of objects which had affinity to one another and threw light on each other, and which students wished to study together. He considered that when that was done we might say that we had a National Art Museum; that at present we had not. "The appointment of such a central authority would be a remedy for the state of chaos in which some of our museums were placed by bequests and gifts of objects of Classical and Mediæval antiquity, and objects of art and of natural science, which were left or presented on the condition they should all be kept in one place. Probably the objection of testators to the unnecessary dispersal of their collections would be removed if they knew that the objects they bequeathed would be distributed in suitable quarters by a responsible central authority." This, we may observe, we are by no means so sure of. People who have made a large collection of any class of valuable objects, especially if it is a collection which successive generations in a family have kept up and added to, have a natural and pardonable feeling of personal pride about it, and like, if they give it to the nation, to do so in such a way that it may be a memorial of the labour of those who collected it. We do not say they would not show a higher public spirit if they desired that the collection should be distributed so as to render the most instruction to the largest number of people; but still the other feeling is natural, and its existence must be taken into account. But this is by the way. The point of Mr. Magniac's speech (a very sensible and comprehensive one) was that when once such a general Government over the museums was appointed, the system of circulation of works by loan to the provinces, now in part carried out very usefully by the South Kensington Museum, could be further extended and made equally applicable to the National Gallery and to the British Museum, the latter of which was not only excused, but, by its constitution, absolutely debarred from lending anything out of its walls.

It would appear, from this brief summary of the discussion, that while most of the speakers were agreed in thinking that more should be done for the provinces, the division between them was as to whether it should be done by grants of money or by increasing the loan system and extending it to the National Gallery and the British Museum. Now in regard to grants of public money to provincial towns for art museums, we must say that as a general rule (to which there may certainly be exceptional cases) we are disposed to think that the balance of arguments is against the use of public money in supplying local needs of this kind, strongly as we have for years urged the importance of establishing museums and galleries of art in our large provincial towns. We have already noticed the question raised by one member, "Where is it to stop?" and to that there is no satisfactory reply. It would hardly be possible to draw any line between one provincial town and another in this respect; subsidise an art museum for one, and it will be a standing grievance with every other town if it is not treated in the same way. Thus a large expenditure would be inevitable; and we do not see that a large expenditure of public money for such a purpose is reasonable except for what is of value to the nation at large, *i.e.*, for central and national institutions. But there is another consideration following on this, which Mr. Magniac half hinted at in his speech. Persons busied in acquiring objects of art always, he said, hated each other as rival collectors, and all the provincial towns would be placed in this invidious position. This might be got over by the suggestion of Mr. Collings, that the purchases should be authorised by South Kensington; but that does not dispose of the whole difficulty. It must be remembered that, after all, the amount of objects of art worth purchasing and keeping in a collection is not unlimited, especially if we take out the immense number which are never likely to be offered for public sale. The Government might give provincial bodies money with which to purchase objects of art and archæology, but it cannot do anything to enlarge the number of purchasable works of art that are worth giving money for. If the loan system were extended, however, a considerable number of objects might profitably be added, at public cost, to a collection which would then be shown in different places successively, and would become of more than merely local interest; and certainly the temporary possession of first-rate works is far more valuable and useful than the permanent possession of works of less value and excellence.

We by no means think, however, that the circulation system should be applied wholesale, or nearly so, to the majority of objects in the central museums of art. In the first place, there is great danger of loss or damage in sending such things from one place to another. In the case of the British Museum, for instance, we would on no account allow of the circulation of the more rare and valuable antiquities, such as, once lost, are lost for ever. Things of lesser value, or of which there were duplicate specimens, might be lent, and the system of making casts and *fac-similes* might be carried still further than it is already at South Kensington. But when people talk of sending things of this kind about the country from one place to another, they do not remember that, besides the risk of damage, the visitors to the Central National Museum (many from the provinces and distant parts of the world) have a right to expect to find that exhibition complete in all essentials, and not find it shorn of some of its chief specimens. In short, a national art museum is an institution which ought to be kept up in preference to local museums, and should naturally and rightly have the first consideration. Mr. Mundella observed, we have no doubt with truth, in replying to some of these suggestions, that there were already not unfrequent complaints from visitors to South Kensington who found that some of the things they had specially come to study had "gone into the country."

With regard to the far larger view suggested by Mr. Magniac, that the whole of the great national museums should be under one responsible head, and should be grouped in regard to the relation of their subjects to one another, while it would be unquestionably an immense task to accomplish, it would certainly be worth doing if it could be done without rendering a great portion of the contents of the museums inaccessible for a long time, and without rearranging and almost rebuilding, or largely adding to, the buildings containing them. But general re-grouping would, we fear, entail all this. The union of the whole under one Government Minister is quite possible, and would probably be of much benefit, more especially, as we venture to think, in breaking through some of the red tape of the British Museum, and compelling the authorities to do more to make the Museum, or some parts of it, generally useful. The state of mind habitual to British Museum Trustees and officials is significantly indicated in Sir John Lubbock's remark in the debate in question, in reply to a suggestion that the British Museum ought to have applied for Parliamentary powers to place some parts of their collection (such as the contents of the Print Room), where they would be of more general use to art students than where they are, and also for powers to lend works generally. Whereunto Sir John Lubbock, speaking, we presume, as a trustee of the British Museum, asks indignantly how it is to be expected that they are to ask for powers to alienate some of their greatest treasures? That is just a specimen of the singular illusion that some of the British Museum officials seem to labour under, that the British Museum is an institution existing for their particular honour and glory, and only for the public in a secondary and in a kind of "on sufferance" fashion. It is really as well that both trustees and officials should be reminded that the British Museum exists for the public, and that if it were proved that any part of its contents would be of more public utility elsewhere, their first duty would be to promote the change, not to oppose it as if the objects were property of their own, of which some one was seeking to deprive them.

Exhibition in Bolton.—The Earl of Bradford has consented to open the Fine Art Exhibition, in aid of the funds of the new infirmary at Bolton, on the 5th of September next. The infirmary building has recently been erected at a cost of 25,000*l.*, and is well adapted for the purposes of an exhibition of paintings and works of art. The Exhibition Committee have already been successful in obtaining the loan of a large number of very important and choice works of art, including more than forty pieces of sculpture, and a collection of bronzes, art pottery, and ancient armour.

MONUMENTS AND LOCAL MEMORIES.

The best locality for a monument, using the word in its primary acceptation of an architectural memorial of the dead, is a question that has been forced on our consideration by a recent loss to the world of letters. It is consistent with the simplicity of the character of Mr. Carlyle that he should have wished his remains to be laid to rest, near those of his wife, in the country churchyard of St. Fechan, in Ecclefechan. To his name there is no one who would have denied the right of inscription on the walls of Westminster Abbey. It remains, however, for consideration (if we are, indeed, justified in looking forward to a long and brilliant succession of great Englishmen) whether, even in exceptional cases such as his, the erection of a tablet should not be allowed to supersede the digging of a grave within the precincts of the Abbey. With the change that has come over public feeling (as well as public opinion) as to the evil practice of intramural interment, each applicant for a resting-place beneath the vaulted roofs of the minster founded by the Confessor must be regarded as more and more inadmissible; and that not for his own lack of merit, but from the physical conditions of the case. Room is limited, and each demand for space leaves a smaller space for the next demand. Room, indeed, is also limited for tablets or works of sculpture; but in this case the demand is usually more modest, and the available room is more ample. We look forward to the time when the walls of the cloister of Westminster Abbey shall be as attractive as those of the Campo Santo of Pisa; not from the treasured memorials of ancient art, but from the records they will offer of the names of the good, the great, and the lamented.

But let us keep to the instance now before us, because it is one as to which there will be no occasion for dispute as to the force of the claim. Tablet, statue, or memorial window to Carlyle we should gladly see erected in the Abbey. But that Great Britain would lose had his remains not been laid to rest in the country churchyard, there to be commemorated also by a suitable monument, we also feel. The two commemorations are not mutually exclusive; were it so, we should still hold that there was a truer pathos, if not a higher moral lesson, attaching to the local than to the public monument.

There is probably no uninspired writer who has so thoroughly grasped the idea that the history of a nation as of an age is the history of its greatest men, as did Carlyle. We used the adjective, not as either appreciative or depreciative of the Scottish writer, but simply as indicating, in passing, that this is a postulate underlying all our sacred writings. It is possible to reduce hero worship, like any form of idolatry, to the ridiculous, by sheer excess. But it would be difficult to attribute so much mischief to such an excess as is likely to spring from the reverse assumption from such popular teaching as that of the "History of the English People" and other works in which the force of public opinion, the influence of the masses, and the like are held up as the motive powers of history. We should perish with cold if we attempted to inhabit Mont Blanc. But as a feature in scenery, a poetic force and entity, what is the contrast between such a snow-clad peak and the "boggy syrtis" of the delta of the Nile? Thus for the training and elevation of the young, there is nothing like the history of great men. And their histories are at once made vocal and illustrated to the eye when we visit their cradles, their homes, their tombs. What is the difference of the effect produced by the statue of Shakespeare in the British Museum, compared with that of the bust at Stratford-on-Avon? The first is a fine work by a great sculptor; the second an ordinary bit of stone-cutting. Yet men go on a pilgrimage to see the latter, who are unaware of the existence of the former. It is at Stratford that we can best read our Shakspeare, and the hold of that great enchanter on the mind would, we venture to say, be somewhat less than it is if he were buried at Westminster. At all events, apart from the memory of the man, the charm and interest of a locality are enhanced by due memorials of its children. A monument which, in a country church, is an object of fascination, is reduced to very mean proportions in the companionship of a metropolitan Campo Santo. Whatever be the upshot of the contest between centralisers and decentralisers in matters political, let us remember that by the centralising objects of art we form not monuments, but museums. When

a man, or a painting, or a statue, is once ticketed and put upon the shelf, the next process is to forget him.

PRACTICAL RECLAMATION.

Recent discussions, to which this is not the place further to refer, as to the practicability or the reverse of reclamation on a large scale, have elicited some very valuable direct testimony from Mr. George Greig, who writes from Ochill Park, Bridge of Allan, as to reclamations begun in 1876 on Auchintoul Farm, Kinbrace, on the estate of the Duke of Sutherland.

For several years past works of reclamation have been in progress on his Grace's property, first at Lairg on Loch Shin, and subsequently at Kinbrace. The first were financially unsuccessful. The expenditure incurred in the Lairg works amounted to 100,000*l.*, in reclaiming 2,000 acres. This is at the rate of 50*l.* per acre, and the rental to be expected, viz., 1*l.* per acre, is manifestly inadequate to cover the outlay. But in this case,—as in so many others,—a large portion of the outlay has to be set down to the cost of education. Personal supervision of the requisite character was wanting, and there was a lack of experience in the use of steam cultivating apparatus. Since that time experience has done much to develope new and more effective implements, and consequently large saving has been effected.

Mr. Greig assumes the entire responsibility, as manager, of the reclamations commenced in 1876 on Auchintoul Farm, Kinbrace. The work has been in steady progress for more than four years, and when completed, next year, nearly 1,400 acres of land will have been reclaimed from the waste, and fully cultivated, at a total cost of 40,000*l.* This cost, moreover, includes not only trenching, draining, clearing, fencing, roads, houses, and lime, but also an outlay of 5*l.* per acre for fertilisers, work, and seeds in laying down the land as pasture. The price, little over 28*l.* per acre, or 23*l.* per acre for reclamation, *plus* 5*l.* per acre for getting in the first manured crop, contrasts very favourably with the expenditure at Lairg, of 50*l.* per acre. Nor are we left to mere paper calculations. In June, 1878, after 20,000*l.* had been expended on the work of reclamation at Kinbrace, the Duke of Sutherland had a formal offer made to him by one of the largest and most successful Scotch sheep farmers to take over the reclamations here made, to take over the extension of them to 3,000 acres, and, on these proving successful, to that of 2,000 acres more, paying a yearly rent for the same at the rate of 3 per cent. on the capital expended. A further proposal was to pay a rent of 7*s.* per sheep on the original capacity of the farm, and to back this offer to the amount of 3,000*l.* per annum rent.

Mr. Greig further points out that the greater part of the outlay on reclamation passes into the hands of the Duke of Sutherland's small tenants and crofters, and that a further sum goes to the Railway Company, of which his Grace is a principal shareholder. Since the passing of the Limited Liability Act, it is estimated that a sum of not less than 180,000,000*l.* has been speculatively invested in other countries and entirely lost. Here is a practical instance of the carrying out of our former recommendation as to lands that want hands. In 1880, out of 56,815,354 acres in Great Britain only 32,101,909 were under culture. Out of 20,819,947 acres in Ireland, 15,357,856 were under culture. Out of 25,938,286 persons living in England and Wales, 801,126, exclusive of vagrants, were in receipt of parochial relief. Here we have money that wants employment, hands that want employment, land that wants culture. Is it an insuperable problem to bring these mutually advantageous elements into relation?

The Growth of London in Streets and Houses.—The report of Lieutenant-Colonel Sir Edmund Henderson on the Metropolitan Police for the year 1880 has been presented to Parliament, and published as a Blue Book. In it Sir Edmund says that "no less than 24,945 new houses were built during the year, and the length of the new streets and squares opened and coming under the protection of the police was within a few yards of seventy miles. The number of new houses considerably exceeds those built in 1879, and is nearly three times as many as were built in 1871."

RAILWAY MOVEMENT OF 1880.

Although the "Railway Returns" for 1880 have not yet been issued by the Board of Trade, —a slackness of which the business world has great cause to complain,—we can set before our readers some of the main features of the movement, as ascertained from the "Statistical Abstract for the United Kingdom from 1866 to 1880," to which we have had occasion to refer for other information.

It may be most convenient to our readers if we place side by side the figures thus arrived at, and those of the "Railway Returns" for 1879.

Length of railways open in the United Kingdom:—

1879	17,696 miles.
1880	17,945 "

Total capital paid up in shares and loans:—

1879	£717,003,489
1880	723,621,657

Number of passengers conveyed (exclusive of season-ticket holders:—

1879	582,732,890
1880	603,834,752

Number of passengers per mile:—

1879	31,800
1880	33,652

Total traffic receipts:—

1879	£59,395,282
1880	61,958,754

Traffic receipts per mile:—

1879	£3,356
1880	3,454

Working expenses:—

1879	£32,045,273
1880	33,592,349

Net traffic receipts:—

1879	£29,731,430
1880	30,985,094

From the above official statements it may be calculated that the increase of the year is in the subjoined proportions:—

Length of line	1·4 per cent.
Capital	1·6 per cent.
Passengers	7·3 per cent.
" per mile	5·7 per cent.
Traffic receipts	4·3 per cent.
" per mile	2·8 per cent.
Working costs	4·5 per cent.
" per cent. of income,	from 52 to 54 per cent.
Net traffic	4·2 per cent.
Proportion of net receipts to paid up capital, from 4·15 to 4·25 per cent.	

FROM LONDON TO LONDON.

Fully 4,000 miles from its ancient namesake, situated in the midst of what is, perhaps, the finest agricultural region in all Canada, is the little city of London, in the county of Middlesex, and in the province of Ontario. It lies a little north of Lake Erie, and somewhat east of Lake Huron, and is built upon the banks of a small stream called the Thames, a river thereabouts just as large as the English Thames is at Hampton Court. London has a bustling population variously computed at from 27,000 to 30,000 souls. It is 120 miles from the Niagara Falls, which lie due east of it, and about the same distance west is Detroit, which is a large and beautiful city, just across the river, upon the United States side. London contains some good streets, and numerous public buildings. Some of the thoroughfares are called after the best known ones in old London, and Westminster and Blackfriars bridges lead one across the narrow silver line of water they have dubbed the Thames. There are two railway-stations, the principal one a good building built of white brick. It is not a terminus, but an open station with wide platform, and the name London stuck up in the middle, in large letters. There are good waiting, washing, and refreshment rooms. Just outside the station is an immense hotel, built, as the station is, of white brick. It is known by the no means euphonious name of "Tecumseh House."

London contains several excellent hotels, especially so is Grigg's House, which, like Tecumseh House, is an hostel hard by the station. There the passing visitor may live "in clover," for as long as or as short a time as he likes, for the moderate cost of one dollar and a half a day (6*s.* 3*d.*). This charge includes everything. In Canada no gratuities are ever expected by "boots" or chambermaid. London in its railways has important connexions. Northward, *viâ* the Grand Trunk, it goes to St. Mary's, southward to Port Stanley, on Lake Erie; westward, to Petrolia, the oil centre; and to Port Sarnia, at the entrance of the St. Clair River into Lake Huron.

The building trade is brisk just now in London, and, indeed, throughout all Canada. The summer sun,—over 100° in the shade, very, very often,—is exceedingly trying, especially as in winter, I believe, the cold is intense; but, notwithstanding, the climate is a healthy one, and although one does not see the stout, jolly-looking men often met with in England, yet everybody looks hard and "wiry." Bricklayers just now are paid $2 50c. a day of ten hours (10*s.* 5*d.*); stonemasons, $2 50c. to $3 (10*s.* 5*d.* to 12*s.* 6*d.*); plasterers, $1 75c. to $2 (7*s.* 3*d.* to 8*s.* 4*d.*); joiners, $1 75c. (7*s.*); hodmen and labourers, $1 50c. (6*s.* 1*d.*). There are several firms of architects in the city. The one who seems to have the most practice is that of Messrs. Tracy & Durand. Mr. Tracy is the city engineer. Messrs. Craddock & Weekes, Peters & Son, and W. Jones also seem to do nice businesses. There are a score or more of building firms in the place. One may remark, passing by, that a glance at the "Directory" shows how the predominant names in England, are, precisely as proportionably plentiful here. As mentioned above, the outside number of population the place contains is 30,000 folks, yet amongst them there are 160 householders rejoicing in the patronymic of Smith, whilst there are forty-six Mr. Joneses, and thirty-five Robinsons.

The principal job at present in hand is an exceedingly imposing block of buildings, known as the Masonic Hall. It stands at the corner of Richmond and King streets, and has also a plain back frontage toward the market-place. This building, which is in the freely-treated French-Classic style of architecture, is being erected from the designs of Messrs. Tracy & Durand. It is built of red brick, with stone dressings, and is of an ornate character. On the lower floor are shops, and over the first-floor windows will be a wide band of subject tiles. These are now being executed by Messrs. Minton in England. To the main entrance there are polished Scottish granite columns, and much well-carved detail is scattered over the two main façades of the edifice. The building is undoubtedly one of merit, but an eye fresh from England views with regret the sham galvanised iron,—what shall I call them? —dressings (!) that, upon close inspection, mar the good impressions made at a little distance. Galvanised iron takes a prominent part in the major portion of most colonial buildings. Upon this new Masonic Hall, for instance, all the top window fronts and the upper cornices, which at first sight look like solid masonry, consist of nothing in the world but galvanised iron, painted a light stone colour. Again, nearer the eye, just over the shops, is a cornice 2 ft. 6 in. deep, well moulded and elaborately carved. It runs round the building, and is apparently in brown stone; a glance, however, reveals the fact that all this detail is simply iron painted brown and sanded! The job is nearly complete, the contractors for the work being Messrs. Goldsmith & Parrett, bricklayers,—Mr. Goldsmith, who seems to have been much respected, died last March,—Mr. Mathieson, stonemason, Mr. Noble, painter, Mr. Mackintosh, plasterer, and Messrs Green & Co., carpenters. Near to this building, a little higher up Richmond-street, three large wholesale stores are building. They are from the designs of Messrs. Peters & Son, architects, and are in white brick, with light coloured Ohio stone dressings. Mr. W. H. Peters, originally a Devonshire man from Honiton, is the clerk of works; this job is about half up. Amongst other works in hand is a good mansion in the Dufferin-avenue; Messrs. Craddock & Weekes are the architects. The cost of this building, which is just having its roof put on, will be about 10,000 dols. A club-house, in Queen's-avenue, is also in hand at a similar cost under Messrs. Tracy & Durand. These gentlemen have also a fine Baptist chapel erecting in Talbot-street. It will cost 12,000 dols., and from their designs a mansion in red brick and Cleveland stone dressings is being built for Mr. Cronyn, barrister-at-law. The probable cost of this house is from 20,000 dols. to 25,000 dols. Some good shops have just been built at the corner of King and Market streets.

The badness of the roads in Canada is proverbial, whilst the "side-walks," as they call the pavement, are worse still. These side-walks are not of stone flags, but formed entirely of 3 in. deal planks, generally laid parallel with the

houses, but sometimes at right angles thereto. In some cities in Canada these wooden pavements are much worse than others. At Quebec, for instance, the culminating point is reached, and my great wonder is that, from constantly putting their feet through holes in rotten boards, half the folks there do not break their ankles. The badness of the Quebec paving is so far recognised, that the Canadians themselves have a saying, that "New side-walks are first fixed down at Toronto, when half-worn out they are taken to Montreal, and when entirely done for they are ready to transplant for use at Quebec!" A few of the streets, notably Richmond-street, which, crossing Dundas-street at right angles, forms with it the two main thoroughfares, have the side-walks macadamised. At present, under the direction of Mr. Tracy, the city engineer, or city surveyor, as we should say in England, wooden blocks are being laid down in Dundas-street; 12,000 ft. of it have been undertaken, the contractors being Messrs. Stevens, Turner, & Burns. A little street leading from Dundas-street to the Market-place, along which much traffic goes, was laid with blocks some time ago, and the treatment seems a great success; indeed, at Detroit and some other American towns, I believe, the blocks have long been in use. They are all 7 in. blocks, of course swamp cedar, laid endways of the grain upon river gravel and fine sand. The section the road-line is made to take is that of a wave mould,—a bold crown in the centre, with a sweeping gutter.

The Post-Office is a good building, and one of the best sites in the place is occupied by the Federal Bank of Canada, at the corner of Richmond and Dundas streets. They possess fine Gothic premises, built of brick and Cleveland stone. There are many fairly good churches and chapels, and upon the outside of the city are not a few handsome villas. The roads are laid out at right angles to each other, and are wide and commanding. The streets in the main part of the town are innocent of trees, but immediately the suburbs are gained long rows of lofty trees line either side, and with the thermometer at 102° in the shade, as it is at the moment these lines are written, offer a grateful shelter from the burning rays to the pedestrian. At night the city is well lighted by gas. The gas company have, I understand, great facilities for the manufacture of this commodity, so much so, that London is at present supplied with gas at about half the price of any other city in the Dominion. Along the main streets, double rows of telegraph-poles run. These are of huge proportions, 18 in. and more through at their base, and running 40 ft. or 50 ft. high. Upon the poles down Dundas-street thirty-four lines of wire run. Tram-cars are in great request, and seem to roll along everywhere. The uniform scale of charge, as elsewhere in the Dominion, is 5 cents. (2½d.). London possesses a fine public park, with a handsome band-stand in its centre.

Taking it altogether, the place is a thriving and prosperous city. The sad accident to the *Victoria*, some two months ago, when nearly 200 souls perished, filled every one with gloom, but that has passed now. I walked a mile down the river's banks, and meandered amongst the big trees at the spot where the catastrophe happened, and could scarcely realise how, in such a wee stream, not one whit, as mentioned before, larger than the Thames at Hampton Court, so many lives could have been lost. The Canadians are pre-eminently loyal, and London is in no way behind in this respect. A review took place the other day, at which I was present, wherein 2,000 volunteers took part, and very fine fellows many of them were.

The most interesting place in all London, perhaps, to the thoughtful and kindly-hearted Englishman is the Guthrie Home at Westminster. Westminster is a suburb two miles or less from the heart of the city, and there at the present moment are some 500 or 600 orphan children, all of them waifs and strays from Britain's capital, from Birmingham, and other large English towns. The children are brought over in batches of 100 or so, boys and girls, from three up to twelve years of age; they are well cared for, and are ultimately adopted out into comfortable families in this country, where they generally find happy homes.

Bound upon a holiday scamper through America, I crossed the Atlantic, a couple of months ago, in the steamship *Parisian*. Therein were between sixty and seventy of these dear children, under the care of Miss Blackhall, a lady who has already bravely and without a murmur faced the horrors of a steerage passage across the angry ocean more than a dozen times on similar missions of mercy. I can testify that during the nine days occupied by our voyage, no children could have been better behaved, none more loving, none more kindly and helpful to each other, than were these waifs, not long ago the scum of the streets, but now, thank God, warmly dressed, well fed, and happy juveniles. During the first few days, the weather being rather rough, they suffered considerably, and it was pitiably curious, if one may use the expression, to see them brought from below, and laid helpless, just in piles, one over another, upon the lee and sunny side of the ship. Very white-faced and dead-looking they were then; but a transformation soon took place: the sickliest child pulled up wonderfully, and ere we had accomplished one-third of our voyage, they were skipping (every little one was provided with a skipping-rope) everywhere, and singing Sankey and Moody's hymns. In fact, the happy laugh of these poor lambs was the sweetest music in all the ship, and fairly infected every one of the thousand souls who found within her a home for the time being. May God prosper the work in hand, and may many thousands of our poor city Arabs find a home in the new land that is ready and able to receive them.

I am not altogether prepared to say whether I can honestly recommend our working men generally to leave old England and come hither. At present I see the country under its best face. It is the month of July. Everything is bright and sunny, and the demand for all sorts of labour is greater than the supply. But I am reminded that the winters are long and severe; that for six months in the year employers too frequently "shut down," or, as we should say, "stop" all the out-door jobs, and then the men have to do the best they can. This set-off in the shape of intensely cold winters is a serious consideration,—especially for those engaged in out-door trades.

London lies upon a flat site; its men are sober, its young women very pretty, and everybody seems fairly prosperous. I have not seen in it a really poor person; nor a single house where squalor and abject poverty look out from the door. Possessing a fair acquaintance more or less with most towns in England, on reviewing them in my mind's eye, Southport, the new Lancashire watering-place, reminds me more than any other place in our own country of the well-to-do city I am now visiting.

My space is filled. From "London in the Bush" to "London in the Smoke" (that is how the good folks hereabouts define the two cities), I waft a kindly greeting! HARRY HEMS.

THE FRANKFURT PATENT AND TRADE-MARK EXHIBITION.

THE days are long gone by when Dannecker's much-admired Ariadne in the Bethmann Museum formed the principal attraction in Frankfurt for all travellers on the Continent. The sons and daughters of Albion especially made it a point to see that masterpiece of the eminent sculptor. At the present day there is something else to be seen and admired. Round the nucleus of the old imperial free-town of many-pointed gables have clustered quarters of palace-like mansions and suburbs of charming villas. At the western end we are invited by the Palmengarten and the rotunda of the Diorama (battle of Sedan), and in the east by the Zoological Gardens. The new Exchange rises behind the old theatre; the new Opera House, by Lucä, at the Bockenheim Gate; the Städel Institute (the picture gallery), on the other side of the Main, in Sachsenhausen. Next to the completed Cathedral, described on a former occasion in these columns, in one of the oldest parts of Frankfurt, we behold the new Städtische Archiv, erected in the Gothic style by the architect Denziger, with its imperial manuscripts and documents from the time of the Carlovingians, and the rich collections having reference to the past history of Frankfurt, all securely housed in the ground-floor.

To all those permanent sights and curiosities of the city, another has this year been added. We are referring to the Patent and Trade-mark Exhibition opened on the 1st of May, and now in the midst of its success. The attractions which it offers have caused thousands of visitors to Frankfurt this summer, numerous at all seasons, to direct their steps to the exhibition. "Steps" is only a figurative expression, for tram-cars and other vehicles shorten the distance very much, the buildings and gardens constituting the exhibition being outside the city. On the opening day it suffered from the chronic disease of all exhibitions, unreadiness; but, of course, it presents a very different picture now, and leaves nothing to be desired on the score of sight-seeing. Two arrangements in the gardens especially act as powerful magnets, and both are of Berlin descent: the excellent and well-known band of Bilse, and Siemens and Halske's electrical railway. The latter is never at a standstill; from the hour of opening to the time of closing most of the carriages are filled, and even the beholder looks upon it with interest, silently conjecturing what an important *rôle* this mysterious motor may yet be destined to play in the history of civilisation. Actuated by the same power, the electrical lift carries the curious to the top of the high tower, from the upper platform of which a splendid view is obtained of the city, the plains surrounding it, and the far and near hills enclosing the horizon. Another point of attraction is the large telescope, only recently completed. As far as we know, this is the first opportunity offered to the general public of observing the stars. It is unfortunate that this enjoyment cannot be so easily obtained as the others that may be had at the exhibition, for entrance to it is restricted to but few hours. The eagerness of the public for admittance is very great, and each one has to wait his turn. The visitor is here enabled, under the guidance of Dr. Harzer, the astronomer of Leipzig Observatory, to observe, from four to six in the afternoon, sun spots and protuberances, and, after the setting in of dark, lunar landscapes and stars *ad libitum*, or aspire to the discovery of new comets. It is reported that this valuable instrument, constructed by Dr. Schröder, of Obersursel, near Frankfurt, will probably be acquired for the city.

An exhibition of an exceptionally valuable nature is the historical exhibition of the Frankfurt Artists' Society, only lately opened. A small but charming Ionic temple rises between the grand entrance to the exhibition and the balneological exhibition, the columns and pediments of which have been chromatically decorated, conveying a pleasant impression to the beholder. One is astonished to find in this little building three large rooms, the walls and other spaces of which are covered with a number of oil and water-colour paintings, drawings, sketches, copper-plates, studies, and casts of sculpture, all works of Frankfurt artists, or such as have resided for a longer or shorter time in the city, amongst whom appear also Hans Holbein the Elder and Peter Cornelius. This exhibition of Frankfurt art thus comprises a series of brilliant names, such as Hans Sebald Beham, the Frankfurt artists' families of Merian and Roos, Theodor de Bry, Schütz, &c., down to the great masters of our time, Cornelius, Overbeck, Veith, Steinle, Schwind, and their disciples and successors, such as Leopold Bode and others. Of especial interest are two landscape drawings of Goethe's, lent by the Weimar Museum.

The chief ornament of the exhibition grounds is formed by what the Germans call "carpet-gardening," and for which Frankfurt is well known,—a style of gardening to which we in England, and London especially, have been long accustomed in our parks. An establishment devoted to enjoyment has only just been thrown open. It is a skating-rink of real ice. The great drought and consequent scarcity of water has been the cause of the delay. This ice saloon will probably be more an object of curiosity than of actual use, for only the most enthusiastic skater would voluntarily undergo the exertion involved in the hot season.

We have described the most salient points of attraction for the ordinary visitor to the Frankfurt Exhibition. It is now time to direct attention to its features of a more practical nature and of greater utility. If we look into the great boiler-house, we find there three boiler systems in operation. Messrs. Walther & Co., of Kalk, introduce Root's tubular boiler with patent tube joints and an ingenious steam-collecting apparatus. The second boiler used in driving the machinery of the exhibition, a MacNicol circulating boiler, is shown by Messrs. Hetzler, Kolb, & Karcher, of Beckingen on the Saar. The third boiler, also tubular, is by E. Willmann, of Dortmund. A criticism of the various systems is not possible until the results of the projected scientific and technical examinations are to hand;

but it may be generally remarked that in all three the makers have endeavoured to obtain a large heating surface on a small section by means of the tubular system, and thus to secure a free circulation of the water in the boiler, while no novelties have been introduced in the system of firing. A tubular boiler by Joseph Prégardien, of Deutz, which is not in operation, attracted last year at Düsseldorf favourable and well-deserved attention. In this division, the boiler for central low-pressure steam-heating exhibited by Ad. Bechem, of Hagen, also deserves notice, being suitable especially for warming private houses cheaply and uniformly.

Of particular technical interest are some boiler fittings, partly shown in operation; for instance, the automatic feed-apparatus of S. G. Cohnfeld, of Zankeroda, and the feed-water heaters and injectors of Gebr. Körting, of Hanover. The exhibits of the latter firm in the patent section should not be overlooked, being interesting even to uninformed persons, demonstrating, as they do, in how many ways the well-known simple principle of the Körting injector has been applied to industrial and sanitary purposes. Besides the various injectors, the automatic railway brake of Sanders, of which a working model is shown in connexion with a Körting injector and suction apparatus, ought to be mentioned. The principle of this vacuum brake, which has been introduced on several German and English railways, and which has proved efficient especially in checking trains on gradients or in curves, is now pretty generally understood, but we may just mention for the benefit of those of our readers who are not thoroughly acquainted with its working that it consists in fixing on each carriage of the train brake cylinders the hollow spaces of which are kept in a state of vacuity, in consequence of which the brake-blocks are held away from the wheels. As soon as, by the opening of a stop-cock, the state of vacuity in the cylinders is either wholly or partially reduced, the brake-blocks are pressed with corresponding force against the wheels. By means of pipes along the whole length of the train, all the brake cylinders are momentarily brought to the same state, the engine-driver being enabled to regulate their vacuity, consequently also the force of the brake, by the aid of a vacuum meter fixed on the engine. In case of a rupture of a train the brake must, as a matter of course, act automatically; but, generally, no carriage can be checked independent of the action of the driver. The same firm show in the balneological section of the exhibition other very interesting applications of the principle of the injector.

If we take a further look into the patent section, the display made by another good firm, Messrs. Klein, Schanzlin, & Becker, of Frankenthal, awakens lively interest. We notice, in the first place, several steam-pumps, working very smoothly, of but modest dimensions, but of very great power, which raise the water for the exhibition. The same makers have also supplied for use during the exhibition an independent boiler feed-pump, with suction and delivery air-vessel in frame, in which the boiler-pressure amounts to ten atmospheres, and a coupled plunger-pump, with post serving as air-chamber, used as water-pump for the ice-machine. The two pumps exhibited at Frankfurt are provided with Klein's adjustable crank, very efficient in preserving a uniform motion. The capability of the two pumps will best be illustrated by stating that they raise 15,405 imperial gallons of water per hour to the height of the reservoir in the water-tower, 115 ft. from the ground. This water supplies the fountains, &c., and runs after use into a collecting basin, whence it is raised again and again to the water-tower by the Klein pumps. If the clackpiece is left out in these pumps, they still constitute a steam-engine useful for performing small work. These pumps also show the patent suction and delivery valve, of importance on account of the regular and steady action, and which has proved efficient in pumps both with slow and quick motion. The Klein self-tightening stopcocks, which do not leak, and are of greater durability than ordinary cocks, also deserve attention. Made of iron, they are very extensively used in chemical factories. The same Frankenthal firm likewise exhibits in action the Lux oil testing apparatus. This instrument is used for comparing different descriptions of oil with regard to their lubricating properties, a curved line drawn upon a paper cylinder giving an exact view of the lubricating property of oil for several hours. For railways and industrial establishments using much oil this testing apparatus is of no small value, especially as it shows at the same time which alloy is best suited for axle-bearings.

The Körner apparatus for consuming fire-damp by chemical means (shown by L. Frobeen, of Berlin) is a most ingenious arrangement. This apparatus consists principally of a Ligroin lamp, the chimneys of which are provided with asbestos caps. The asbestos is impregnated with platinum and palladium, so that the fire-damp is consumed without danger at the red-hot caps. This lamp is, at any rate, a most remarkable endeavour to render fire-damp, which plays such havoc in our coal-mines, innocuous in a chemical way, instead of, as hitherto, by physical means. The same firm exhibits two rock-drilling machines, in which air is compressed in a cylinder by turning the crank, which throws the drilling-bar forward, and at the same time revolves and pushes it on ahead. Another object worth notice is a feed-apparatus for air-chambers, and an ore stamp-mill. A very important and powerful apparatus for ventilating rooms is the turbine ventilator, with hydraulic power, which may also be made in the form of a stove with either pulsating or aspirating action.

We have thus brought our notice of the Patent and Trade-mark Exhibition now being held at Frankfurt to a conclusion, and drawn the attention of probable visitors from England to such sights and exhibits as ought not be overlooked by them. We have shown that the exhibition is in some respects a remarkable one, as is further evidenced by the fact that such an important body as the Society of German Engineers, which will hold its annual meeting (the twenty-fifth year of its existence having elapsed on May 12th last) at Stuttgart, from August 22nd to 25th, have thought it worth while to pay a preliminary visit this week to the exhibition before assembling at their trysting-place. The exhibition is a proof of the benefits conferred on the nation by the German Patent Law, which has been in operation only a few years. Another point of really practical importance, not to be overlooked, is that inventors will be enabled, through the opportunities given by the Exhibition Committee, to derive pecuniary profit from their inventions, that body having undertaken to be the disinterested medium between the inventive genius and the capitalist.

THE OLD JESUIT CHURCH AT MÜNSTER, WESTPHALIA.

The building of which we give an illustration at present serves as a chapel to the great Public School or Gymnasium at Münster. It was, however, formerly the Church of the Jesuits, and served both as a place of worship for the students attached to the great college of the order, and for externs who desired to attend the services and sermons held by the fathers within its walls.

The first stone of this interesting church was laid on the 3rd of June in the year 1590, and the building was completed nine years later.

It consists of a long nave and aisles terminating to the east in a single apse. The aisles are two stories in height, both vaulted, as is also the nave. The upper story or division of the aisles forms a large kind of triforium or gallery. This treatment is common to the churches of the Jesuit order, and is to be seen in their churches at Cologne, Aix-la-Chapelle, Dusseldorf, Coblentz, Würzburg, &c. The students of the colleges which were attached to these churches used the galleries, and the general public were accommodated with seats upon the ground floor.

As will be seen from the view which we publish, the architecture is a curious mixture of Third Pointed Gothic, with the revived Classic of the period. The general plan and arrangement belong entirely to the former style, as do also the vaulting, window tracery, buttresses, &c., whereas the doorways and cornices partake of the latter. There is, however, a much more distinct Gothic feeling about the building than its date would have led us to expect, and, singularly enough, this is the case with most of the earlier churches erected in Germany by the same order. Of course, one would naturally have expected to have found exactly the reverse the case; yet, strange to say, the Jesuits were very nearly reviving Gothic architecture in Germany. Their churches at Coblentz, Cologne, and Paderborn, all erected after the commencement of the seventeenth century, are, especially internally, thoroughly Gothic in character, and it is, perhaps, not too much to say that the Jesuit church at Cologne is the noblest Gothic church erected anywhere since the year 1600. Its precise date is 1621—1629, and whether we regard it as the last great expiring effort of Gothic architecture, or as a most remarkable effort at its revival, it is a building deserving of very careful study.

One point to which we wish to call attention is the construction of the vaultings of these Jesuit churches. They are probably the latest examples of Gothic vaults, and their builders had profited by the experiments and experience of four centuries, and the result of this is the fact that these vaults appear to have no thrust. The walls of the clearstories of all the churches we have named are very thin and entirely without buttresses, though in the case of the church at Cologne the span of the vault is about 40 ft.! These vaults are composed of a rather acutely-pointed barrel-vault running from east to west, with lunettes cutting into it from north to south; the whole is covered with a rich network of ribs dividing it into triangular compartments. The spaces thus enclosed are exceedingly concave, so that each triangular space forms a kind of dome, and if a section be taken through the vault, except at the surface of the ribs, it will give the outline of a deeply-cusped arch, though the ribs all project to the face of what would in section be an acutely-pointed arch. At first we supposed that the vault was very much loaded, but a little examination proved this not to be the case, because these convex sinkings are continued right down almost to the cap of the vaulting shaft,—in fact, to the point where the ribs unite. The effect of this kind of vaulting is exceedingly ornamental, and its constructive excellence is shown by the fact that, although it rests upon remarkably thin walls they are not affected (those of the church at Münster do not appear to be more than 2 ft. in thickness), and we could discover no crack, opening, or settlement. We should mention that the ribs are stone and the soffit of the vault is constructed of small red bricks covered with plaster. The vaulting-ribs are very deep and narrow, and their section is more like that of a window-mullion than what we are accustomed to see applied to a vaulting-rib; the bosses are large and adorned with shields.

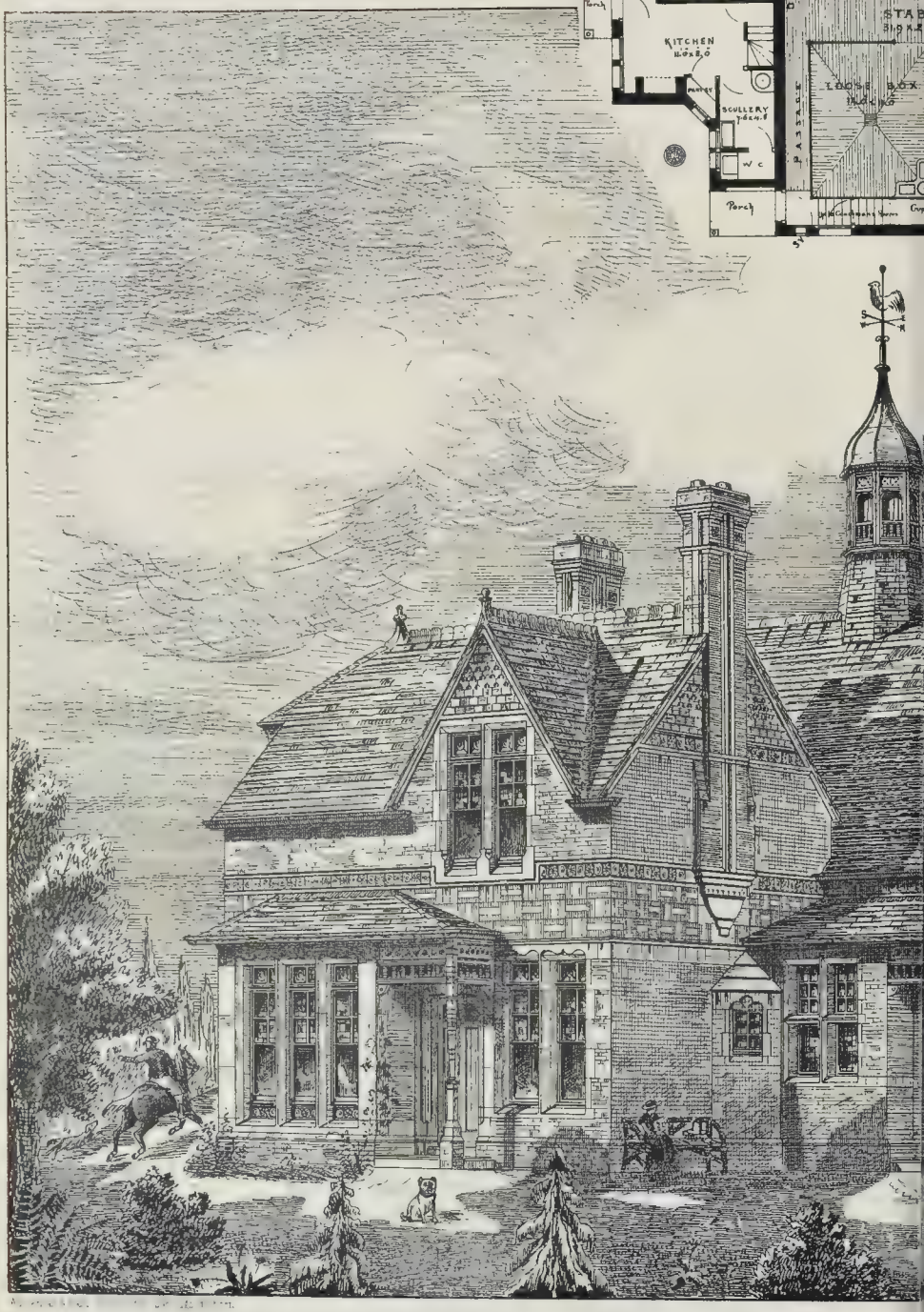
The fittings of the church at Münster, like those of all the other Gothic Jesuit churches we have seen, are quite Renaissance in character. The reredoses are well designed and piled up story over story in a very picturesque manner. Great attention appears to have been bestowed upon the doorways, which are remarkably pretty examples of "freely treated" Classic. The collegiate buildings attached to this church are in style very like our English Jacobean, and although slightly earlier in date than the church retain far less Gothic treatment than does the church itself.

PARIS.

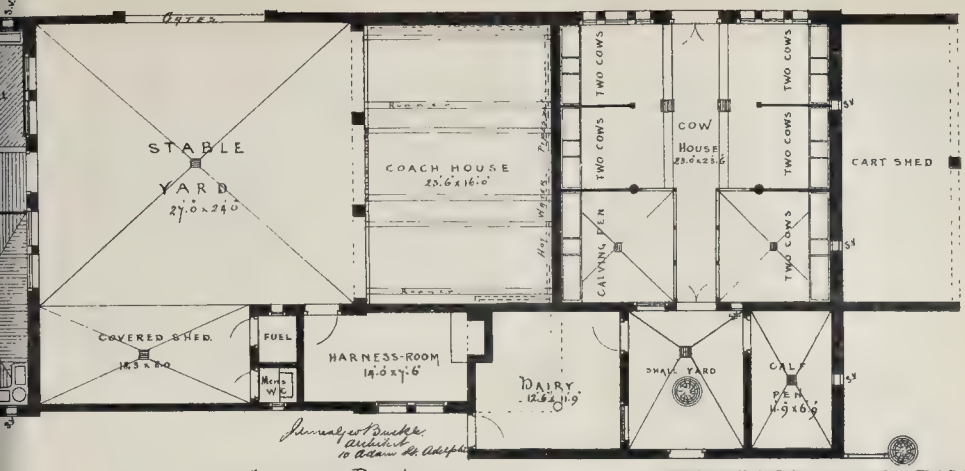
It is proposed to establish a retail provision market in the Temple quarter to replace the ancient market of St. Martin, which will be shortly suppressed. There is also a question as to the establishment of a new market in the Plaine Monceaux, where the number of recent buildings erected makes the provision of a new market a matter of urgency. The open-air market in the Avenue Wagram is found to be insufficient, especially for the wealthy classes who have lately come into this neighbourhood, and who are obliged to seek their provisions in the centre of Paris. Two sites have been suggested,—one at the angle of Rue Ampère and Rue Brémontier, the other at the angle of Rue Ampère and the Avenue Wagram.

The municipality, not having been able to agree with the owners of the property, will be compelled to obtain the site by compulsory purchase, which will delay for some time the carrying out of the work.

Literary Congress, Netherlands. — A literary Netherlands Congress is to be held at Breda on the 31st of August, continuing till the 3rd of September proximo. It will be composed of Dutch and Belgians. It is divided into three sections, viz.:—1. Netherland language and literature; 2. History and archæology; 3. Theatre, music, plastic arts, and library. A committee has been appointed for the management of this business.



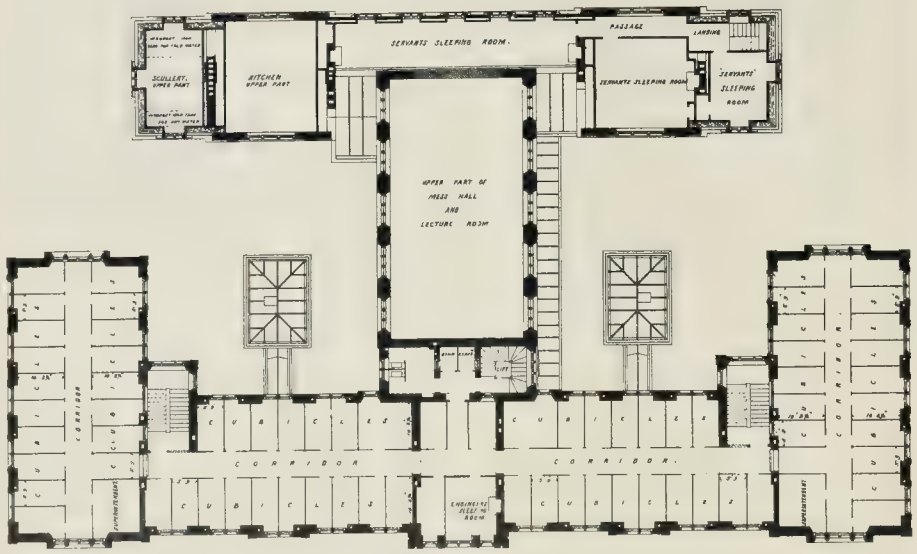
LODGE AND STABLE BUILDINGS,



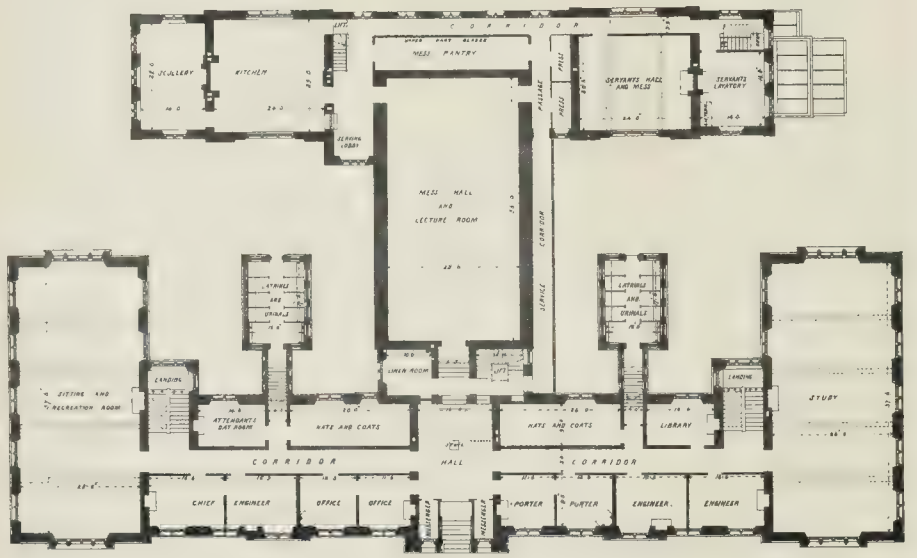


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—Mr. Jas. George Buckle, Architect.



FIRST FLOOR PLAN.

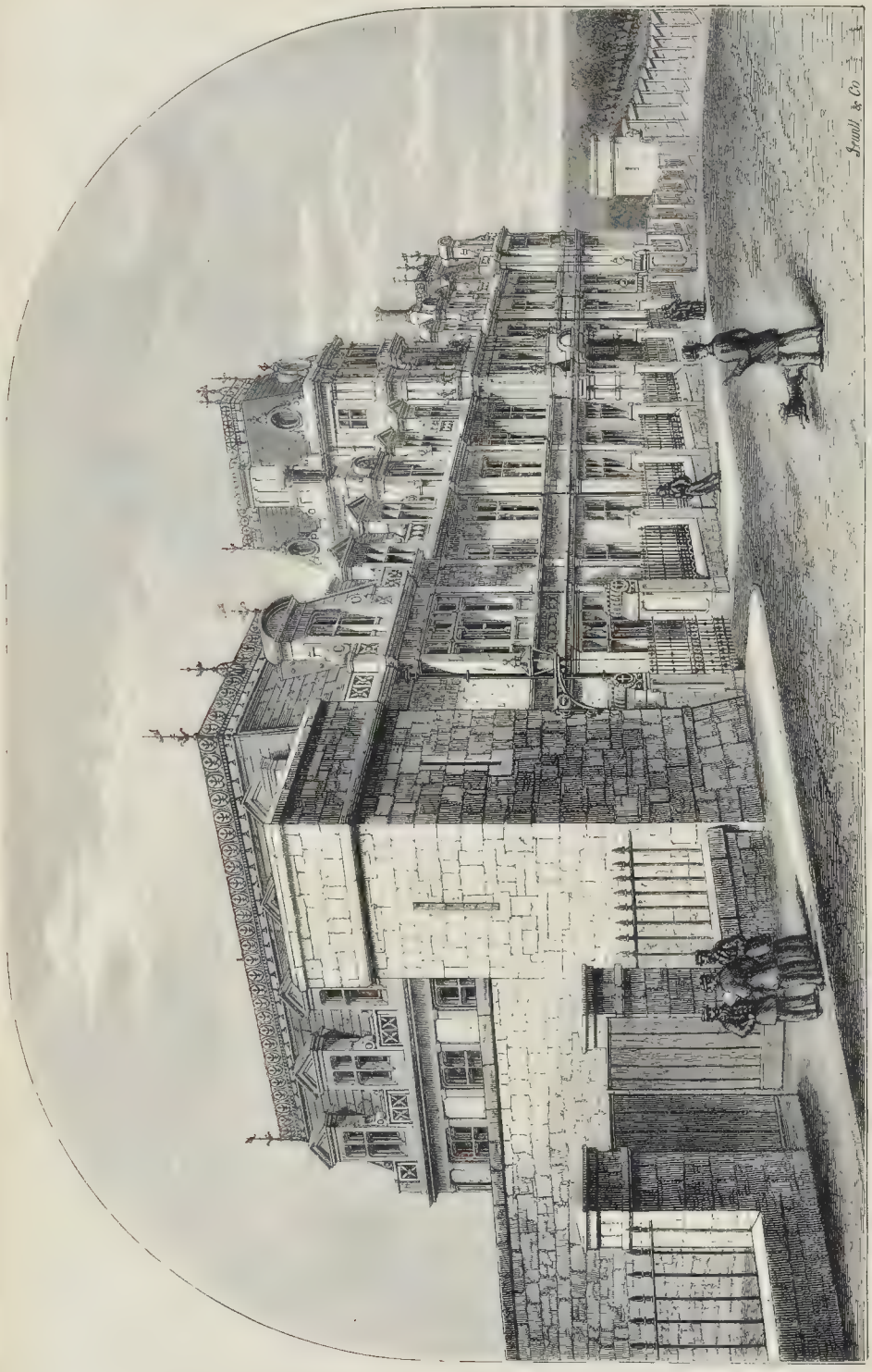


GROUND PLAN.

SCALE OF FEET.

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KEYHAM YARD: QUARTERS FOR ENGINEER STUDENTS

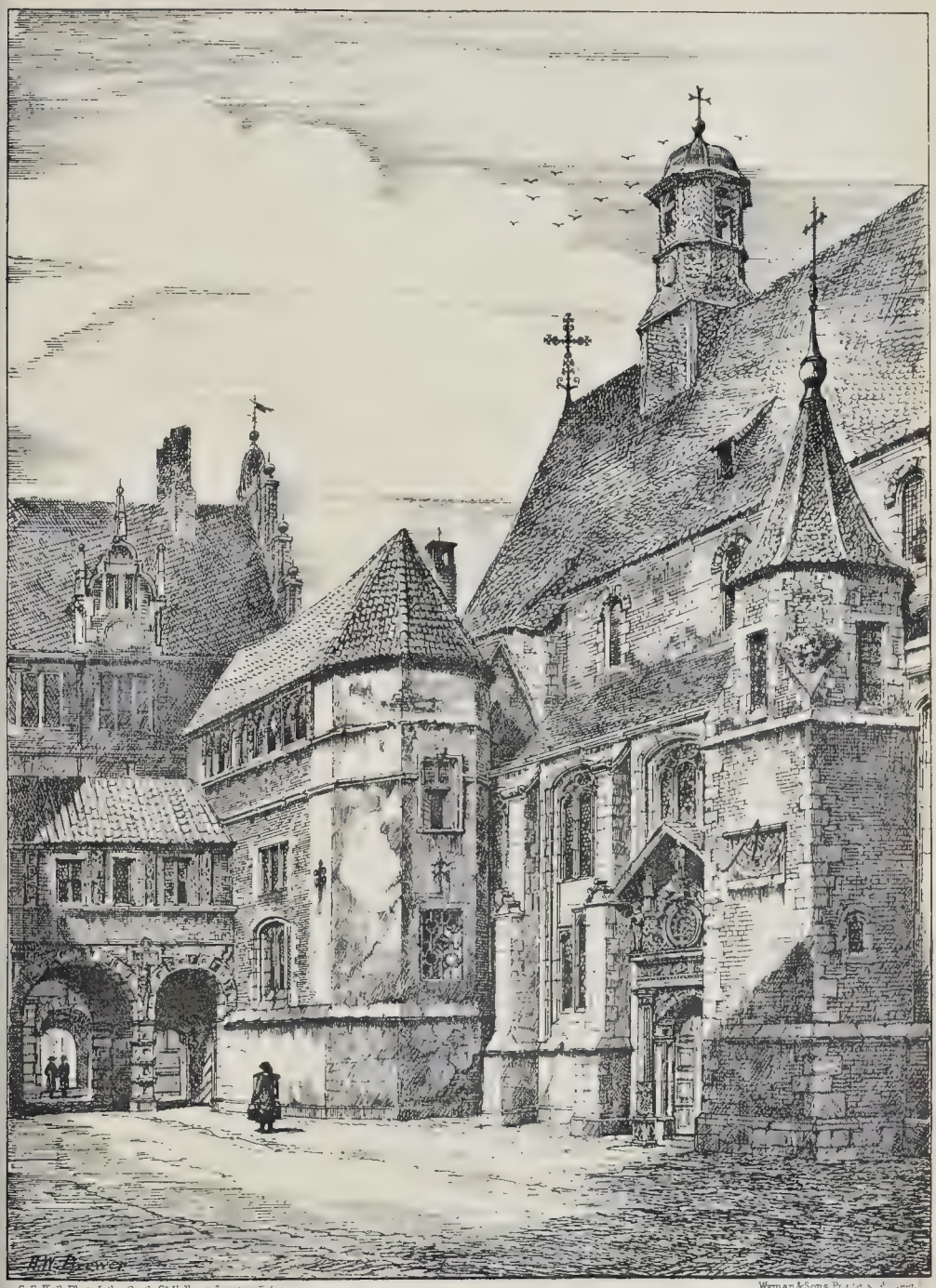


THE ENGINEER STUDENTS' QUARTERS, KEYHAM, DEVONPORT.—Erected under the Direction of Colonel Pasley, C.B., R.E.



THE "CONVENTO DE CHRISTO," AT THOMAR, PORTUGAL: CLOISTERS OF THE CEMETERY.

Attributed to Commencement of the Twelfth Century.



C F Kell Photo Litho Castle St Holborn London E C

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THE OLD JESUIT CHURCH AT MÜNSTER, WESTPHALIA: *Commenced*, 1590; *Completed*, 1599.

THE ENGINEER STUDENTS' QUARTERS, KEYHAM, DEVONPORT.

The site of the new College for Engineer Students at Keyham-yard abuts on the Saltash-road, overlooking Keyham-yard in its rear, and the Hamoaze, with its naval anchorage, to the north. The new quarters occupy an area just beyond the official residences, and the buildings are on the same level, some 30 ft. above the floor of the yard. The plans were prepared at the Admiralty Office, Spring-gardens, under the direction of Colonel Pasley, C.B. The main building, which is of three stories above the basement, has a frontage of about 200 ft. This, the principal elevation, has in the centre a tower, carried up from the entrance, slightly in advance of the flanks, and higher by one story than these, or the wings, somewhat similar in design, which complete the frontage. The materials used,—limestone ashlar, with Portland dressings,—are well adapted to the style. Mullioned and transomed windows fill in the openings. The upper story has dormer windows; the tower and wings, having Mansard roofs, are finished by a bold cresting of Macfarlane's ornamental ironwork, with gilded vanes.

The site is rectangular, and slopes to the north and rear, the basement occupying the declivity, and bringing the ground-floor to a level with the high-road. The design of the main building takes the form of the letter I reversed, and the premises, with the narrow courtlage surrounding them, occupy all the space at the architect's disposal. There are three exits opening on the courtyard, in addition to a "tradesmen's porch," and the entrances to the cellars and stores. Roughly speaking, the premises consist of the officers' and students' residential quarters, which, with the spacious study and recreation hall, occupy the frontage, the mess and lecture hall in the centre of block, immediately beyond the main entrance, and the kitchens and servants' quarters flanking them in the rear. The basement of the frontage underlies the tower and the north wing, the former occupied by the coal-cellars, the furnace-room of the heating system, and a fine suite of baths and lavatories. The rear-block basement, under the kitchen and servants' quarters, is given up to the cook and steward, and contains, besides two rooms for each of these functionaries, a long range of cool and dark larders, the coal-cellar, knife and boots room, and other offices. In the yards are the latrines, separate, well-fitted, well-ventilated buildings, each capped by a flushing-tank of some 3,000 gallons capacity. The servants' latrines are fitted up on the system of Macfarlane & Co., who have given much attention, and with considerable success, to the arrangement and appearance of structures of this kind.

We give a view of the principal front, and plans, which will sufficiently show the accommodation provided.

Above the basement one side of the building is a *facsimile* of the other, the entrance-hall and tower rooms standing between. The former, the vestibule, is reached by a short flight of steps, steps again lead to some small rooms under the tower, and more steps to the great hall. The misfortune of the building in respect of site is apparent enough in the necessity for these gradients, which dwarf the entrance and hall. From the entrance, which is flanked by messengers' lobbies, broad steps open to the vestibule, a stone-paved hall from which on either side a corridor branches. Upon the corridors neat suites of rooms, designated as officers' apartments, are placed, and the passages end at the common rooms of the college,—at one end the recreation-room, and at the other the study. The two rooms correspond exactly. Each of them occupies an entire floor of the wing, and has an area of about 1,500 ft., the dimensions being:—Length, 57 ft. 6 in.; width, 26 ft.; and height 13 ft. 9 in. They are warmed by Manchester grates, the speciality of which is a chamber at the back from which a current of heated air is continually being diffused. The windows of the recreation-room overlook the shipping in the Hamoaze; the view from the study windows is limited more closely. The only room in the building which is superior to these is the mess and lecture hall, where the advantage of superior height is seen. It occupies the central position on the site. Lighted from each side by five mullioned and transomed windows as well as by dormers in the lofty circular roof and a three-centred segmental window at the extreme end, it is luminous and airy. The roof is borne upon moulded timber ribs, springing from carved corbels. The only additional ornament is a pedimental entablature with voluted trusses, above the main entrance, which will support a clock. Hot-water pipes running the length of the hall provide for heating, and for ventilation there are several perforated discs in the roof, all communicating with a "trunk" above, which extends the length of the hall, and is fitted with one of Howorth's Archimedean ventilators, of large size. The ventilator is inclosed in a flèche. For evening use gas pendants hung from the roof are provided, and these centre in the ventilating discs already mentioned. The kitchen offices in rear of the mess-hall are provided with a special corridor, so that access may be had thence to the main building without entering the hall.

Each corridor has a flight of stairs leading to the upper floors. These are the dormitories for the students. Each flank is partitioned off into sixty-six little compartments, 10 ft. by 5 ft. 6 in. in area, with the regulation fixtures, bed, washstand, chest of drawers, and book-case. On each floor are two double-sized cubicles for superintendents. Down each gangway hot-water pipes run beneath the usual grating. Every cubicle is separately lighted, and is in all respects distinct. Sleeping accommodation is thus provided on each floor for sixty-six students and four superintendents, and the two stories devoted to the dormitories afford room for 132 students and eight superintendents, the space occupied being that of 148 cubicles. This arrangement leaves the tower-rooms untouched, and they are fitted up as officers' quarters. The height of the first floor is 11 ft. 9 in., and that of the second floor 13 ft. 9 in. Each wing has its separate staircase and separate offices of all kinds, as well as its own exit into the courtyard. Above the level of the dormitories there are two additional stories in the tower, which form the sick-bay of the establishment, with an attendant's room above.

The kitchen, a lofty room, 24 ft. square, and the scullery adjoining it, having been fitted up by Messrs. Benham & Sons, of Wigmore-street, London, with cooking apparatus sufficient for the daily requirements of from 150 to 200 persons. The ranges, which are fixed back to back, cover an area of 81 square feet. Large ovens for baking and roasting, and jacketed boilers for steam cooking, as well as appliances for steaming potatoes, heating water and plates, and supplying hot water to the baths, are found connected with the kitchen. A cylindrical boiler is fitted in the basement for the maintenance of this service, and a lift connects the kitchen with the stores. In the other wing of the rear block is a spacious servants' hall, and in the floor above are the servants' bedrooms. Dependent on the kitchen for hot-water supply, but otherwise detached from it, are the baths and lavatories, in the basement of the mess-hall. The space available for lavatories is divided into a sufficient number of separate enclosures for the whole of the students, and to each water is laid on, and a galvanised tub and sink fixed. There are five baths, supplied with hot and cold water. The floor, which is of asphalt, was specially laid by Claridge's Asphalt Company, of London.

The cost, as appears from the Naval Estimates, has been above 30,000*l*. The staircases are of teak; the passages below stairs are laid with York paving. The limestone facing of the walls is of stone from the Pomphlett quarries, and this is backed with a lining of brick. The Portland stone used in the dressings was prepared on the works by stone-dressing machinery. The premises are laid throughout with a hot-water system. The lift, which works from the basement to the upper floors, is fitted with Waygood & Co.'s automatic check. For the windows, the sash-fastener invented by Mr. Brenton, of Polbathic, is employed throughout the college. The buildings were erected by Mr. John Pethick, of Plymouth, under the superintendence of Mr. Tinkler, the Government clerk of works.

THE LATE MR. HARVEY EGINTON, ARCHITECT.

A well-known Shakspearian scholar is anxious to ascertain who has the papers of the late Mr. Harvey Eginton, the architect who restored Stratford-on-Avon Church in 1837. As this is to aid in a somewhat important Shakspearian inquiry, we willingly ask the question, and shall be glad to have it answered.

LODGE AND STABLE BUILDINGS, EDGWARE.

Our illustration represents stable buildings recently completed at Orange-hill, Edgware, for Mr. William Ruddock. The accommodation provided consists of five rooms in lodge; four-stall stable and two loose boxes, with loft and three rooms over the stable for coachman; coach-house for three carriages; harness-room; cow-house for twelve cows; calf-house; and dairy. Spacious lofts are provided in the roofs. The materials are stock-bricks internally with red facings. The window-sills and door-jambs are formed with white bull-nose bricks; Pether's bricks for the arches, and Brown's ornamental pateræ for the string-courses. The stable fittings and hot-water apparatus were supplied by Messrs. Marshall & Hatch. It may interest our professional readers to know that the stone dressings were executed with Beer stone, which, although exposed to the severest trials during last winter, failed only in one or two instances. The buildings were erected by W. J. Beale, of Battersea, under the superintendence of the architect, Mr. James George Buckle, of 10, Adam-street, Adelphi. The mansion to which these stables are attached is now being built by the proprietor without a contractor from designs and under the supervision of the same architect.

THE CLOISTERS OF THE "CONVENTO DE CHRISTO," THOMAR, PORTUGAL.

Among the architectural monuments of Portugal to which importance attaches, not only on account of their historical associations but their value also to the architect and archæologist with regard to their styles, must be placed the "Convento de Christo" of Thomar, one of the finest edifices in Portugal. Its early traditions are mixed up with those of the historic fortress of Gualdim Paes, Master of the Order of the Knights Templars, who established themselves in Portugal in 1125. The façade of this edifice was erected much later, namely, in the reign of Dom João III., the fifteenth king of Portugal, who reigned between the years 1521 and 1557. The building was considerably enlarged by his grandson, Dom Sebastião, who succeeded him on the throne; and, subsequently, by the three kings, Dons Filippe II., III., and IV., of Castella, who reigned in Portugal between the years 1580 and 1640. The edifice has attached to it more cloisters than any other convent in Portugal. These cloisters present to the discerning eye of the architect and archæologist specimens of a variety of styles extending through the various architectural epochs of that kingdom, and including the Renaissance from its first introduction in the ecclesiastical architecture of Christendom down to its most flourishing epoch.

We intend noticing here briefly only the cloisters, one of which we illustrate. This adjoins the chapel, and is of small dimensions; it is devoid of any considerable amount of ornamentation, but is of solid construction. It bears unmistakable marks of antiquity, and is said to be co-eval with the first foundation of the Knights Templars in Portugal.

Two other cloisters were erected by the Infante Dom Henrique, one of which is at present in ruins, and which was partly destroyed during the fatal period of Vandalism during which all the monuments of Portugal suffered. Another cloister, called "Santa Barbara," was erected by King Dom Manuel; it is small, but of handsome appearance, and in the Gothic style. Another larger cloister, adjoining, is mediocre in execution, and without attraction and beauty. The same may be said of that called "Corvos." The cloister called "Mixo" is only remarkable as permitting a view, through one of the openings of its upper walls, of the gates in the façade of the hall where, according to tradition, the three estates of the realm, the clergy, nobility, and commons, assembled at the call of King Filippe II. of Castella, in 1581. The cloister called "the Filippes" surpasses all the others in grandeur and excellence of execution. The superabundance of its ornamentation, and the multiplicity of its columns, far from detracting from its merits, combine to make it a most beautiful production of the Renaissance of that period in Portugal.

The cloister which we illustrate is that of the Cemetery used as the last resting-place for the members of the Order of Christ. It ranks early, as we have said, in the chronological order of the erection of the cloisters, and is a very late-

resting work. It displays pointed arches, supported by slender double columns, ending in elegantly-carved capitals in the Gothico-Byzantine style. The name of its architect is not known.

DISCUSSION ON SANITARY PLUMBING.

On Monday evening last there took place, in the Hall of the Society of Arts, Adelphi, a discussion on the lectures* delivered there during the last three months by Mr. S. Stevens Hellyer, under the auspices of the National Health Society, on "The Science and Art of Sanitary Plumbing." There was a good attendance, the audience comprising not only working plumbers, but many master plumbers, and several architects and sanitary engineers.

Mr. Ernest Hart presided, and in opening the proceedings read the conditions which have been laid down by the National Health Society for the working plumbers' competition for the prizes offered by the society for the best specimens of workmanship in plumbing based on sanitary principles. Any one who desires to compete must fill up a form to be obtained from the National Health Society, 44, Berners-street, and all such forms must be returned by the 15th of September.

Mr. Daniel Emptage, of Margate, led off the discussion by reading a short paper, in which he expressed his opinion that Mr. Hellyer's able lectures were calculated to do a vast amount of good in awakening interest upon the important subject of which they treated. He agreed in the main with Mr. Hellyer's remarks as to country shops, and with the advice given to young working plumbers to come up to London to improve themselves in their trade. At the same time, as a provincial man, he felt bound to say a few words on behalf of the plumbers of provincial towns, in many of which a very lively interest was taken in sanitary matters. In his own town there were many large scholastic and other establishments in which the sanitary arrangements were such as would be hardly found fault with even by Mr. Hellyer. As the result of a large number of practical experiments made during the last two years, he (the speaker) had arrived at the following conclusions with regard to trap-waving or syphonage, viz.:—1. That the ᔓ or P syphons are, when unventilated, very unsafe, from the fact that they are easily untrapped by waving-out or syphonage. 2. That the cast D, the "Eclipse," and the V traps hold their seals much more tenaciously than the syphons, but are still very liable under some conditions to become unsealed when not properly protected by ventilation. 3. That the old D is very much more difficult to untrap than any of the preceding traps, but even this, when without ventilation, is not safe from syphonage. 4. That the seal of a P syphon, even under the most favourable circumstances with respect to ventilation, is not safe against a rush of water passing rapidly through it. 5. That a well-made ᔓ trap, when properly ventilated, and fixed in connexion with a fully-ventilated soil-pipe, is very difficult to unseal. 6. That the other four traps mentioned are, when properly ventilated, quite secure from either waving out or syphonage, and they have the advantage of being so constructed that their connexion with the soil-pipe could be made at a much higher level than was possible with the ᔓ. They all have, however the great disadvantage of being more foul. Mr. Emptage went on to say that, while thinking over the matter, it occurred to him that the ᔓ trap might be so altered that, while retaining its non-syphoning qualities, it should at the same time allow of a connexion with the soil-pipe similar to the others. He had such a trap made, and was very pleased to find it answer his expectations in every respect. In it he still retained the dome of the "outgo" as in the ᔓ. He had subjected this new form of trap to the most severe tests, and found that when it was fully protected by ventilation it was quite safe from waving or syphonage. He had since patented it. With regard to ventilation, to properly ventilate a soil-pipe and trap, careful thought was required. The kind of apparatus, length of soil-pipe and vent-pipe, also the arrangements below the soil-pipe, must all be taken into consideration, because the diameter of pipe which would be ample for one arrangement would be quite inadequate for another. He was very much surprised to hear Mr. Hellyer say that he should be satisfied with a 2-in. vent-pipe, 50 ft. or 60 ft. long, to ventilate a soil-pipe and trap 7 ft. long and open at the foot. He had practically tried such an arrangement fitted with the five traps before mentioned, alternately, and he found that the only trap which would be quite safe under such conditions was the D. The trap which required the most carefully ventilating was the plain round siphon, and that which required the least was the old D. There was, however, a great difference in the effect which ventilation had upon the two traps. With the syphon the water still rushed through, thoroughly cleansing the trap, and leaving it sealed with perfectly clear water, but the D retained more filth when fitted with an air-pipe than without one. He agreed with Mr. Hellyer in condemning the pan-closet, and the outcome of the experience he (the speaker) had gained since abandoning the pan-closet was that the direct-action closets, such as Phillips's "Sanitary," the "Artisan," the "Carmichael," and the "Vortex," were far superior to several of the more costly ones. Such closets, fixed in a proper manner, with suitable ventilation, and with a flush of two gallons delivered in five seconds, were, in his experience, unequalled for cleanliness. With regard to cowls, he had fixed several on soil-pipes and drains at Margate, both in exposed and in sheltered positions, and upon several he had made some careful observations. In one instance he found during a slight shuffy wind that Banner's cowl repeatedly stopped mouth to wind, at which times the smoke with which he was testing it escaped at the foot-vent. In another case he found that after the smoke had ceased to issue from Banner's cowl, it came up again if he removed the cowl, and ceased when he replaced it. He tried that three times with the same results. In both these instances he found the plain open pipe quite as effective as with the cowl,—indeed, more so. From other observations he was convinced that in cases where the ventilation of the soil-pipes and drains was so arranged that it mattered not whether the current of air passed up or down them, open pipes were best. There were, however, places where it was very desirable to, as far as possible, prevent down-draught, and in such cases cowls were sometimes very useful. In conclusion, Mr. Emptage urged upon all connected with the plumbing trade the necessity of giving increased study to the subject, and expressed his thanks to Mr. Ernest Turner for suggesting, to the National Health Society for promoting, and to Mr. Hellyer for delivering, the lectures.

Mr. Robert Smith denied that Mr. Hellyer was correct in his statement that non-society workmen in the plumbing trade were better workmen than society men. Why should they be? Society men had to rely upon themselves and upon the character of their work as much as non-society men. Mr. Hellyer had advocated the granting of certificates of competency to plumbers. Some years ago there was a serious strike and lock-out in the building trade upon the introduction of what was known at the time as the "Document." Such a certificate as was advocated by Mr. Hellyer would be neither more nor less than the "Document" in a new form, and if the suggestion were adopted the working plumber would be entirely in the power and at the mercy of his employer. While there was some truth in Mr. Hellyer's assertion that young plumbers did not always have a proper opportunity of learning their trade when they were apprenticed in small shops, it should not be forgotten that in a small shop an apprentice would have a greater range and variety of work in all branches, whereas in large shops the principle of subdivision of labour was sure to be more or less thoroughly carried out, and the apprentice would most likely be kept almost entirely to that particular branch of work in which he showed most proficiency. He denied that the ᔓ trap was superior to the D trap, and claimed for the latter that if properly made it was self-cleansing. He thought Mr. Hellyer had been unduly severe in his strictures upon the poor working plumber, while he had "let down" Mr. Norman Shaw very gently,—perhaps because Mr. Shaw was an architect for whom Mr. Hellyer might hope to do work in the future.

The Chairman here intimated that he thought Mr. Smith was going a little wide of the point in imputing personal motives.

Mr. Smith thought he was justified in what he had said. He did not think much of the practicability of Mr. Hellyer's recommendation to use 2½ in. soil-pipes. Although the lectures had been very entertaining, he did not think that the audience had had one particle of knowledge imparted to them from beginning to end ("Oh, oh!" laughter, and hisses). He certainly had not gained one particle of information. The lectures had been of a most rudimentary kind.

Mr. P. J. Davies observed that a great deal had been said by Mr. Hellyer about D-traps being non-cleansing, but he (the speaker) contended that if such traps were properly made they were as much self-cleansing traps as ᔓ or round-pipe traps. Mr. Davies proceeded to show, by experiment, that such matters as pebbles and pocket-handkerchiefs could be washed out of a D-trap by one flush, and he concluded by describing the means of geometrically setting-out an improved form of D-trap contrived by him. The improvement consists, first, in making the "band" of a width not exceeding that of the outside of the dip, the cheeks being only so far apart as just to admit the dip-pipe between them. Secondly, the improvement consists in making the "outgo" of the cheeks of such a shape as will most readily facilitate the passage of the contents of the trap outward over the "band."

Mr. T. H. Court said that, as a practical working foreman of plumbers, he was prepared to say that some of the statements contained in Mr. Hellyer's lectures were calculated to do harm to young plumbers; for instance, the advice to the workman to provide himself or to burden his "mate" with two pots of solder, one to make underhand joints, and the other for general work. If a workman asked him for two solder-pots he should probably give him his ticket to get his money and go off the job. Then Mr. Hellyer had recommended the workman to dilute his solder by putting metal into it. That was very bad advice to give to young plumbers. Every working plumber ought to know without very much testing whether a bar of solder was fit for use or not; if he did not he certainly had not learnt the art of making his solder. He was surprised that Mr. Hellyer had not given some instruction on that point, and that he had not described the way of telling when the solder got foul and the manner of cleansing it. As to joints, Mr. Hellyer had recommended long ones, which were thought by some to be better in appearance than short ones, and to have less tendency to "sweat" because they were wiped cleaner than short ones. But the tendency to sweat could be obviated equally well by bright as by over-cast joints. He did not agree with Mr. Hellyer in saying that ᔓ traps were less liable to "fur" and more self-cleansing than D-traps. Mr. Hellyer had strongly condemned the journeyman plumber for defective work, the blame of which should frequently rest upon architects and others. As foreman of a job, he (the speaker) once had put into his hand a specification in which it was provided that a ¾-in. service-pipe should be used for the supply of four urinals, four closets, three lavatories, two sinks, and a bath (!). He condemned that arrangement as inadequate, and got a clerk of works to represent its inadequacy to the architect; but he was told in reply to follow the specification. The result was that in less than twelve months the whole of the sanitary arrangements were out of order, and a sanitary engineer was called in to put them right. He thought Mr. Hellyer was inconsistent in condemning the pan-closet and yet continuing to supply it. He (the speaker) had had many of them taken out, and when asked what should be done with them, he had always said, "Smash 'em up, and throw 'em on the heap, for they are a disgrace to any one who fixes 'em!"

Mr. W. P. Buchan (of Glasgow) said he had not had the privilege of hearing Mr. Hellyer's lectures, but he was happy to have had the opportunity of reading the reports of them, and he thought very highly of them, notwithstanding the criticisms which he had heard from previous speakers. So far as he could judge from the lectures, as published, he approved of almost everything that Mr. Hellyer had said. He (Mr. Buchan) was at a loss to understand the favour in which the D-trap seemed to be held by some of the speakers, and their prejudice against the syphon-trap. Glasgow was no inconsiderable city, and a great deal of good plumbing work was to be found there; yet, as a Glasgow-bred plumber of thirty years' experience, he never remembered seeing a D-trap used there. All the Glasgow plumbing was done

* For reports of the lectures see the *Builder*, vol. xl., pp. 651, 711, 775; and current vol. pp. 27, 87, 185.

with syphon traps, and syphonage was easily preventible by means of ventilation. It seemed to be forgotten that the ventilating pipe to a trap, if properly made and fixed, killed two birds with one stone, so to speak, for it prevented syphonage, and at the same time prevented the accumulation of foul gases, which would eat away the lead unless carried off. Mr. Davies's experiments with his D-trap were not to his (the speaker's) mind altogether conclusive, for pebbles and pocket-handkerchiefs could be more easily cleared out of a trap than urinary matter and flocculent particles of fæces. Much as was to be said against the D-trap, however, it was far safer to use it than to use a trapless closet. Where illness resulting in death arose from the use of trapless closets, the fixers of them ought to be found guilty of manslaughter. He thought that no one could defend the use of trapless closets upon any scientific or hygienic ground. Pan-closets were bad enough, but where they could not be removed, their evils could be mitigated by ventilating the containers, but with two pipes. While some architects were not blameless for bad plumbing, there were others who had done a great deal to promote good work. There were, he knew, many workmen in the trade who were only partially competent, but Mr. Hellyer's lectures were part of a movement designed to help every working plumber to become a first-class workman. He considered that plumbing was the leading trade connected with building, and that plumbers ought to be the best paid workmen in the building trade. Upon the working plumber largely depended the health of many a household, and as he was often sent to do work without being supervised by a foreman, he should, when of proved competency and reliability, be remunerated for his work with some regard to the responsibility of his position.

Mr. J. Vance said that sometimes when a working plumber who understood his business ventured to point out a defect or a bad arrangement in plumbing work proposed to be done, he was told, by architect or proprietor, as the case might be, "Do as you are told; you are not paid for knowing anything about it, you are paid for doing the work according to instructions!" Personally he felt very much indebted to Mr. Hellyer for his lectures. He had only to say, in conclusion, that when architects or sanitary engineers came on a job to give instructions as to plumbing, they should see the plumber himself, and not give their instructions to the general foreman of works, who most likely knew nothing of plumbing work, and would therefore be unable to clearly explain their wishes. Instead of allowing their instructions about plumbing to be conveyed secondhand, architects and sanitary engineers would do well to see the plumber himself.

Mr. S. Douglass Scoffern said he had not had the advantage of hearing Mr. Hellyer's lectures, which he was sure were of great practical value, but he wished to direct attention to the grave responsibility incurred by partially-instructed tradesmen who arrogated to themselves, without any proper warrant, the title of sanitary, gas, or hot-water engineer, and sometimes all combined. Such pretensions deluded the public, who, by confiding in such men, often incurred disaster. He cited last winter's experience of frozen water-pipes and fatal explosions of kitchen boilers in proof of the danger of employing incompetent men.

Mr. H. H. Collins said that as so much had been said in condemnation of trapless closets, he felt bound to say that one which he had had in use for several years had answered admirably. A good trapless closet had much to recommend it if properly situated and fixed. Of course, if placed in close proximity to, or in absolute conjunction with, a sewer, it would be a most objectionable appliance to use. He wished to say, in reference to what had been said about architects' neglect or ignorance of sanitary details, that very often an architect was no more able to help himself against the stupidity or obstinacy of his client than a tradesman or workman was able to set at nought the instructions of his employer. It was obviously to the interest of the architect to make his buildings healthy; for, if he did not, the sanitary work of houses would pass into the hands of a class of gentlemen called "specialists." It should be remembered that all tradesmen had not established themselves as firmly as Mr. Hellyer, and that all architects did not occupy the proud position of Mr. Norman Shaw. It was not every tradesman nor every architect who could afford to say, "If you won't have the work carried out as I say it ought to be done, I won't undertake it." To an ordinary tradesman or architect the reply would be, "Very well; I will go elsewhere!" Thus to be too high-minded would be, in many cases, to starve. The architect who paid due regard to the most important branches of his work, viz.,—those relating to construction and sanitation, would not spend a lot of his client's money in decorative work to the neglect of sanitary conditions. Personally, he felt deeply indebted to Mr. Hellyer for what he had done, not only by these lectures, but by his writings, to improve the sanitary condition of houses. He was sorry for the speaker who had said he had not gained one particle of information from Mr. Hellyer's lectures, for Dr. Johnson told us that we could learn something even from a fool.

Mr. Lammas urged the formation of an institution for the encouragement, protection, and advancement of the plumbing trade,—a place where the members could meet to read, think, and discuss methods and principles of work, and including, if possible, a small workshop, where the members could put their ideas into execution and to the test of practical experiment. He felt very much indebted to Mr. Hellyer for his lectures.

Mr. Wise supported the suggestion made by the last speaker.

Mr. Savory said that although, perhaps, all that had been said by Mr. Hellyer was not to be taken without question, he had laid down many principles which could not be controverted. It was desirable that the lectures should be published *in extenso* in a cheap form, together with a report of the discussion.

The Chairman, in closing the discussion, said that when Mr. Ernest Turner suggested that the National Health Society should arrange for a course of lectures to working plumbers upon the principles and practice of sanitary plumbing, the initial difficulty was to get a competent lecturer. He knowing the name of Mr. Hellyer as that of the writer of the best practical work on plumbing, invited him to give the lectures, and after consideration he consented to do so, although very much occupied with business and not in the best of health. The lectures had been undertaken by Mr. Hellyer without any remuneration beyond that which was afforded him by the knowledge that they have aroused considerable thought and directed much attention to the subject. The laborious and complete way in which the lectures had been illustrated by diagrams was worthy of all praise. The lectures had been delivered not only in the presence of working plumbers, but in the presence of some of the most skilled and experienced judges of sanitary work in the country, including Mr. Rogers Field, Mr. Ernest Turner, Mr. H. H. Collins, and Mr. Eassie, and he had the authority for saying that those gentlemen regarded Mr. Hellyer's lectures as being of very great value.

Mr. Hellyer, in replying on the discussion, said that he was gratified to find that the remarks made by those who had spoken in the discussion were so largely in favour of the observations he had made in his lectures. With reference to Mr. Emptage's remarks on cowls, he would only say that his experience was that cowls were of advantage: they might, perhaps, add about 10 per cent. to the up-current. He had not made any actual experiments with cowls, but he had found them, in scores of cases, very helpful. Up-currents of air in soil-pipes could generally be increased by the use of proper cowls. With regard to non-society men *versus* society men, considered as workmen, he simply stated his conviction, based on experience, when he said that as a rule non-society men were the best workmen. He wanted the trade societies to be more careful in excluding incompetent men than they had been. He had no more feeling against society men than against non-society men, and had good workmen belonging to both classes in his employ. He was very glad if, as a result of his lectures, Mr. Davies had been able to improve the D-trap, but he (Mr. Hellyer) like a previous speaker, could not see the conclusiveness of the experiments which had been made with Mr. Davies's trap. He challenged the accuracy of Mr. Court's statement that anything said by him in the course of these lectures was calculated to do harm to young plumbers. With regard to using two pots of solder, he simply recommended that in large buildings or jobs two pots of solder should be in use, one for underhand joints and one for coarser joints, the object being to save time. Time was an important element in work, and as an employer of labour he valued time. It frequently hinged upon time whether a master plumber made profit or no profit on a job. As to pan-closets, he had previously explained that he only supplied them under protest, when there was no help but to use them, as in the circumstances he had mentioned. As a matter-of-fact, irrespective of the job to which he had referred, his firm had almost entirely discarded their manufacture and use, and had not supplied more than thirty during the last three years. On all their circulars it was expressly stated beneath the illustration of the pan-closet that it was not an appliance to be recommended. He was gratified that Mr. Buchan should have supported by the weight of his experience what he (the lecturer) had said, for Mr. Buchan was well known throughout the country. Notwithstanding what Mr. Collins had said as to trapless closets, he (the lecturer) still stood by his condemnation of them. In conclusion, Mr. Hellyer said he looked upon sanitary plumbing as an important branch of Preventive Medicine, and, therefore, he regarded the efforts which were being made by members of the medical profession to render it more common as most disinterested and praiseworthy.

After some questions as to whether the specimens of plumbers' work exhibited at the recent Sanitary Exhibition could compete for the National Health Society's prizes (to which the chairman replied in the affirmative), the meeting closed with thanks to Mr. Hellyer and the chairman.

THE ST. JOHN AMBULANCE ASSOCIATION.

On Saturday last, the interesting and instructive Medical and Sanitary Exhibition, which a large number of the professional and outside public owe to the energy of the authorities of the Parkes Museum of Hygiene, was brought to a close, after a highly-successful and only too short a period, by a "demonstration," so the official programme had it, of the pupils of the St. John Ambulance Association, a demonstration illustrating the methods by which hasty and ready aid can be afforded to the wounded and injured in any of the sad accidents which unfortunately so frequently occur.

We specially notice this closing feature of the Exhibition, not alone on the score of its forming one of the features of an exhibition in the aims of which so many of our readers are interested, but with a view to drawing attention,—as we hope to do more fully at a later date,—to the praiseworthy aims of the Ambulance Association, established now some four years since by the Order of St. John of Jerusalem in England, "for the purpose of disseminating general information as to the preliminary treatment of the sick and injured, among all classes of society."

To the readers of any widely-circulated journal attention drawn to an association with such aims would be interesting, but to the readers of the *Builder* the objects of the St. John Ambulance Association are, we feel sure, of particular importance. Accidents, and unavoidable accidents, so frequently happen among those employed in the building and kindred trades that some knowledge of the treatment necessary for the wounded, in the first place, would be of the utmost service in cases of emergency. The series of experiments offered to the public on Saturday last was typical of the accidents that are daily likely to occur; eight different features formed the programme, cases illustrating first aid to be rendered to the injured by civilians (male and female) after railway and other accidents; methods of lifting and carrying the injured; the use of the stretcher; case of gunshot wound to the right thigh breaking the bone; case of both legs broken below the knees by a gunpowder explosion; right hand crushed by machinery accident, with severe arterial bleeding; left foot shot off, with severe arterial bleeding; man found in the streets in a state of insensibility, with a severe wound in the head; and finally the different ways in which a man can help a wounded comrade to reach home. In all these cases aiders and fictitious wounded were ably personated by a number of policemen, civilians, volunteers, and members of the regular army. Great interest, as may be imagined, was evinced by the large crowd collected in the conservatory of the Horticultural Society's Garden to witness the interesting and instructive

"demonstration," the chief and most useful lesson borne away from which by the uninitiated should, we believe, be considered to be that in cases of accident presence of mind and very simple apparatus, not necessarily surgical, are amply sufficient in accidents to afford the first aid to the injured; walking-sticks, umbrellas, bayonets, swords, sheaths, policemen's truncheons, straps, handkerchiefs, scarves, are materials that can be found at hand in all emergencies, and serve admirably at a pinch all purposes of temporary splints and other scientific apparatus.*

We learn that in the four years of its existence, the Ambulance Association has awarded no fewer than 30,000 certificates of proficiency in the admirable course of instruction it affords to persons of both sexes and of every rank of life.

How often do we admire the presence of mind that is displayed by workmen whenever a serious accident takes place in the workshop, but how much more often have we to regret the absence of the knowledge of the precise manner in which immediately to treat a case of fracture or severe bleeding, and how still more often have we to deplore the absence of those who have the slightest conception of what to do in a case of emergency? It is this knowledge, so necessary to aid the professional skill, which the St. John Ambulance Association is desirous to spread among the public.

The Medical and Sanitary Exhibition organised by the Committee of the Parkes Museum was open for the last time on Saturday, August 13th, when the number of visitors, exclusive of season-ticket holders, was 1,221, making a total of 24,333 visitors in the four weeks during which the Exhibition has been open, allowing only for one visit by each season-ticket holder. During the day, the Secretary, Mr. Mark Judge, visited the different exhibitors for the purpose of ascertaining their opinion as to the success of the Exhibition. The exhibitors generally expressed themselves as well satisfied with the result, some going so far as to say that they had done an exceptional amount of business, owing to the fact that a very large proportion of the visitors had been either medical men, architects, or engineers. The representatives of the exhibitors, who have been in daily attendance during the Exhibition, marked their appreciation of the arrangements made for their convenience, by presenting, on Saturday, a small purse of gold to the Superintendent, Mr. Smithson.

ARCHITECTS' CHARGES.

FLOATING A COMPANY.

An arbitration case, which involved several important points as affecting architects' charges, was concluded at the Institution of Surveyors on Friday, the 5th inst., after having occupied two days. The claimant, Mr. Paraire, sought to recover 3,000*l.* for preparing plans, obtaining an estimate for the Alcazar, Leicester-square, and for negotiating for financing the company.

Mr. Glynn was counsel for the claimant. Mr. Winch and Mr. A. Ward appeared for the Alcazar Company. Mr. John Whichcord, past-president of the Royal Institute of British Architects, is the arbitrator.

Mr. Paraire stated the nature of the work done, and Mr. Allbutt, a financier, described the progress which was made in financing the company when the building project was abandoned. The nature of the case will be gathered from the counsel's speeches. It was agreed not to call any architects as witnesses to the custom of the profession, the arbitrator himself being pre-eminently qualified to judge upon points of practice and the reasonableness of the charges. Mr. Glynn, however, read a letter from Mr. Cates, who was unable to be present, stating that he considered the amount claimed by Mr. Paraire to be fair and reasonable; and though the urgency of the company prevented the completion of the work, it involved more cost to Mr. Paraire than if it had been carried out in the usual way. The object was to obtain a *bonâ fide* tender, and that Mr. Paraire procured, and his claim to remuneration for it seemed perfectly clear. Mr. Glynn further stated that he should have called Professor Roger Smith, whose evidence would have been to the same effect.

Mr. Ward said his evidence would, on the contrary, have been that these charges were four times too much.

Mr. Glynn remarked that Prof. Smith took 2½ per cent. instead of 3 per cent.; and he had the Professor and another architect present to prove the facts, but he agreed to leave it in the arbitrator's hands without calling them; but he wished to say that the evidence he could tender would have struck him with astonishment.

Mr. Whichcord said he should feel perfectly at liberty to call upon any one of the witnesses on either side to come to him afterwards if he thought it necessary.

The counsel on both sides agreed that this might be done.

Mr. Glynn called the surveyor who took out the quantities.

Mr. Stephen B. Wilson, surveyor, 27, Walbrook, stated that he prepared the quantities as produced for the purpose of obtaining a builder's estimate. He himself prepared an estimate. It was an approximate sum arrived at by comparing this with other similar buildings. Mr. Paraire gave him the drawings which had been put in, and likewise attended him to explain the way in which he wished the works to be done. The quantities were not taken out in detail. He had previously made an estimate for the Holborn, and also for the Horseshoe. He took generally the quantities for the brickwork, the slating, the floors, and the main items; and he made a comparison between these and the other buildings which he had named. He took the cube of the several buildings, and then he added to or deducted from it, as the case might be. He formed that into a bill, and the result was the estimate now produced, 65,000*l.*, and a builder subsequently accepted that price. He communicated with Messrs. Green & King, builders, and saw one of them at Mr. Blair's, and explained the way in which he had arrived at the estimate. After they had gone into the particulars, Mr. King said he should be happy to give a tender if witness would write him a letter naming the approximate quantities. He wrote a letter to the firm on the 7th of January, 1879.

Mr. Ward remarked that that letter was not strictly evidence, but he should not object to it if the arbitrator wished it to be put in.

The arbitrator observed that Messrs. Green & King were a link in the chain, and he thought it was quite relevant to ascertain what took place between them and this witness.

Witness stated that he took the superficial quantities of the roofs, floors, and galleries, and he deduced the prices from the other buildings. The letter of the 7th of January was then put in. In it he wrote, "I approximately estimate the structural cost as follows:" and then gave the details. Messrs. Green & King in their reply said,—"After going into the probable cost we are of opinion that the structure can be built for the sum of 65,000*l.*"

Mr. Ward.—Is the witness not suing the company for the value of his work in preparing these estimates?

Witness.—I am.

Mr. Ward.—Then we shall in all probability meet again upon that question.

Examination continued.—He afterwards prepared a schedule of prices. The schedule was put in, and was dated September, 1879. He consulted Mr. Paraire in the ordinary way. He afterwards attended before the directors with that schedule of prices, and they were approved of generally. They went through them item by item, and Mr. Wingfield, one of the directors, said he knew as much about building and the price of a rod of brickwork as any one in London.

Mr. Glynn intimated that that concluded the case for the claimant, and before proceeding to sum up the evidence, he remarked that though his learned friend, Mr. Ward, seemed to think that in the course of the hearing he had cast some reflections on the directors of the company, nothing was really further from his thoughts, and he unconditionally withdrew anything that could be so construed. There was a noble lord on the board, and he was rather anxious to know what learned lords knew about these things; and, of course, the directors looked after their fees; but that was only what everybody did after having done his work. Mr. Paraire, in working for this company had a great many masters, and he appeared to have done his work to the satisfaction of most of them; and it was important to notice what they wished to be done and what they determined to build. Mr. Paraire was appointed the architect by resolution, and in pursuance of that resolution he did this work. There were certain preliminary services, which were not part of the work of the architect, and for these he claimed 82*l.* 10*s.* This included a structural plan, which, by his advice, was put upon the prospectus of the company; and also charges for attendance at several of the directors' meetings. For all such preliminary services it was well known that the solicitors, the surveyors, the directors, and the promoters, expected to be paid fairly, and more than fairly, because it was disagreeable work, and it was uncertain whether the company would float. The claim in connexion with the application for a licence was virtually admitted. The next item was 1,625*l.*, being 2½ per cent. on the tender of 65,000*l.* which Messrs. Green & King said they were prepared to give. He did not care whether the arbitrator was of opinion that they were prepared to carry that out or not. Mr. Cates and all the witnesses were of opinion that it did not make any difference, as regarded the quantities, whether the tender was accepted or not. Mr. Paraire had done his work, and was entitled to the scale of payment laid down by the Institute of Architects. If the directors had not got a tender, it was their fault. They had chosen to form a ground-rent, and not build the Alcazar at all; but they could not avail themselves of that to refuse to pay these charges. It was exactly the same as an ordinary case of selling property. If you bring buyer and seller together, and the seller then said, "I will employ you no longer; I will not sell," the person who introduced the buyer to the seller is entitled to his commission. They were dealing with professional gentlemen, whose charges were not to be measured in the way that the Alcazar Company seemed to think they should be measured. It was not a mere question of time, as with a cabman, nor of the cost of paper, paint, or pencils. He was entitled to fair remuneration, according to the recognised scale in the profession, and that amounted to 1,625*l.* The next item was 325*l.* for getting the builders' tender. Mr. Paraire was instructed by the Board to assist in preparing the quantities which it was desired to get out in a great hurry. For these services, which had nothing to do with the other work, he charged according to scale, and there was no evidence impugning the accuracy of the claim. The only other item in dispute was 68*l.*, for obtaining the necessary capital. Mr. Paraire stated that he had bargained with the directors that for financing the company he was to receive 1½ per cent. on the amount required for the building, and that he succeeded was not refuted, though Mr. Allbutt was cross-examined for two hours and a half. There was a resolution of the company showing that the directors very well knew he was endeavouring to get the money, and if he had not been able to get it he was entitled to fair remuneration for the work he did. But his contention was that he did get it. Mr. Allbutt, a financier engaged by Messrs. Boston & Co., for the purpose of carrying this matter out, stated that he was prepared to provide the money if the Alcazar Company had gone on; and Mr. Paraire having introduced Messrs. Bolton & Co. to the directors was entitled to his commission of 1½ per cent. Mr. Paraire had been kept out of his money for a very considerable time, and he claimed interest, which the arbitrator was entitled to give on the amount which he might award. The very small sum of 1,000*l.* was ordered to be paid into court by the Master, and the defendants would have to pay interest upon that as well as on the amount that was due, because it was only paid into court as security for the claim, and they would otherwise not have been entitled to bring this action at all. In conclusion, Mr. Glynn thanked the arbitrator for the very great attention he had given to this matter, and for his kindness in consulting the convenience of the counsel engaged.

Mr. Winch, replying on behalf of the Alcazar Company, stated that, when the directors had this bill before them, they consulted gentlemen of Mr. Paraire's own profession, and obtained from them a decided opinion that it was four times as much as it ought to be, and therefore they were bound to dispute it. But that they did not wish to do so unfairly was shown by their agreeing to send it to one who stood at the top of Mr. Paraire's own profession to be decided. There were twenty guineas for services before the company was formed, about which he would not trouble. Then there were thirty-six guineas for the large coloured elevation, which was before them, as to which the arbitrator could form an opinion. The substantial part or claim was the percentages. Now, 2½ per cent., if justifiable at all, was justified upon the basis of a document very well known,—the professional charges,—which said that if an architect had drawn out plans complete, with elevations, sections, and specifications, the charge was 2½ per cent. commission upon the estimated cost, and if he had procured tenders the charge was ½ per cent. extra. But Mr. Paraire's own evidence showed that he had not brought himself within that rule. There was no specification, or drawings, and no plan of the roof. Therefore the claim must fall back upon work and labour. Of course, as the arbitrator had intimated, if a man was asked to design a building, and by a stroke of genius immediately sketched off the key-note of the whole thing, it might be worth 1,000*l.*, but that was a gift which ordinary men did not possess. If, however, the arbitrator saw in this design an unusual display of genius, by all means the claimant must have a due sum for it. He would take Mr. Paraire's own figures (5*l.* a day) for his ordinary work. Allowing these plans to have taken eight weeks, and including Sundays, it would give 280*l.* The addition to be made for genius he would leave to the arbitrator, merely remarking that it was a building which was not put up, and did not succeed. The design was not so brilliant as to induce the public to come forward and subscribe 65,000*l.* He did not say that a man who had to use his brains should only be paid for mere mechanical labour; but he should be very much astonished if the arbitrator put the value on the plaintiff's brains in preparing these plans at 1,400*l.* Then as to the claim for 325*l.* That was put in the summary account as ½ per cent. for getting a tender; but as his friend, Mr. Glynn, could not argue that there was a tender here, it was now put on the ground that Mr. Paraire was obliged to give the surveyor an immense amount of assistance in order that he might be able to get out the quantities. But if he did, it was all thrown away, as the surveyor did not pay much attention to it. He squared the floors and the roof, and then got hold of another plan to compare the figures with, and said that was near enough. Messrs. Green & King's letter was no tender, but simply an expression of opinion that the work could be done for a certain sum. It was an estimate obtained to put before the shareholders to give them some sort of opinion what the building would cost, and that some sort of opinion was 65,000*l.*; but whether it could be erected for that was very shadowy. They would agree to do it at Laxton's prices, and well they might, seeing that they were top prices, and tenders were always a percentage under them. In giving the surveyor his assistance, Mr. Paraire was occupied five or six days, and surely this was mechanical work, to be paid for at his own valuation, 5*l.* a day. Then came the last item, 680*l.*, for financing, and the question was whether the plaintiff did find any

* We remember a distinguished painter once having been able at an emergency to successfully set and bind up a broken arm, with a splint made of an old palette, a number of paint-brushes, and his painting-rag; on the arrival of the doctor nothing more was found to be necessary.

body who was willing to advance the money. Now, Mr. Allbutt's offer was that he was prepared at once to proceed with the building, provided the undertaking was handed over for reconstruction, three directors nominated by the company to take seats on the reconstructed board along with three appointed by the capitalists, but no liability could be entertained beyond a mortgage of 30,000*l.* The directors would have accepted even this modified contract conditionally on having 5,000*l.* down, but the parties could not agree. He therefore submitted that Mr. Parsire had entirely failed to obtain the 65,000*l.*, or an offer of it. Where a man had made a specific contract of this sort, he either got all his commission or nothing; but the directors did not wish him to be without remuneration, and would give him 5*l.* a day for the time he was engaged in the matter. The Company, he was glad to say, were well able to pay whatever might be awarded, but the directors felt they were not justified in drawing a cheque for this 3,000*l.*, and they had adopted the only course a body of gentlemen ought to do, by submitting it to arbitration.

This terminated the proceedings, the Arbitrator taking time to consider his award, and if necessary, to consult professional gentlemen named by either side.

WILTSHIRE ARCHÆOLOGICAL SOCIETY.

STONEHENGE.

The annual meeting of this Society was held last week at Bradford-on-Avon. The general meeting of members was held on Tuesday in the Town-hall, Sir Charles Hobhouse, bart., presiding.

The report read by the secretary (Rev. A. C. Smith) showed that the Society, both numerically and financially, was in a flourishing state; but during the past year the Association had lost very many useful and worthy members. The attention of the committee had been directed to the present condition of Stonehenge, some of the stones of which were leaning at such an angle as to render their fall at no very remote period a certainty. They had, therefore, communicated with the Society of Antiquaries, who had appointed a committee to report as to what steps should be taken in the matter, and should they deem that immediate steps were necessary, it would remain to approach the owner of the property and ask his consent to allow the necessary operations to be performed.

On the motion of the Rev. W. C. Kis, seconded by Mr. T. B. Saunders, the report was adopted.

Mr. Saunders deprecated any attempt to restore Stonehenge, remarking that such a proceeding would result in having Stonehenge such as it was never seen by the Druids or those before them.

The officers of the Society having been re-elected, with Mr. H. E. Medlicott, of Potterne, appointed as general secretary, in place of Mr. C. H. Talbot,

Sir Charles Hobhouse delivered an interesting inaugural address. He said he felt himself to be an absolute tyro in archæology. Most of his life had been spent in India, and but for a train of circumstances which occurred soon after his residence in Wiltshire he would never have acquired a taste for the study of the subject. After he had been poring over the parish registers or some old terrier of the days of Elizabeth, he was inclined to ask of the art of archæology,—*cui bono?*—What good is it? He supposed he need not answer that question in such an assembly; but still, it seemed to him that even the enemies of archæology, if they would consider a little, would find that they themselves spent a great part of their time in the midst of that study which they affected to despise. The life of a man was spent in three worlds,—the past, the present, and the future,—and all the study of the past history, biography, &c., was really the study of archæology. The wants of every-day life were to a great extent dependent upon that study. Any one choosing a house in the country or the suburbs of London would not prefer a house in the modern style of architecture,—that meant a square door in the centre, two square windows on either side of the door, and three square windows above. They would rather choose a house built in the Elizabethan or Hanoverian style, making use of modern appliances for internal comfort. But the taste for art in architecture was growing out of the increasing love for archæology. The comparison between a modern building and one the produce of a remote antiquity showed that there was still much to be learnt. When travelling in India he was struck with the wonderfully large water-tanks, the sides of which were made with huge blocks of stone laid one on another, without any kind of cement or clamps. No repairs, he was told, were ever needed; how was it that in the case of modern reservoirs they did not profit by the lessons of antiquity? Sir Charles then described the beauties of the Hindoo temple at Agra, and the emblematical royalty of Akbar's camp at Futtehpore Sikri, each of which was, thanks to the climate, in almost as good a condition as when constructed. He did not mean to say that we should imitate those things, but he thought they taught us moderns many a lesson in the science of architecture. He further described the wonders of the rock-cut temples in Western India. Archæology, he said, was the history of the one of our rural parishes, and in miniature the history of the whole country. To illustrate this he gave the history of his own parish (Monckton Farleigh) from the time of the compiling of the Domesday-book, and traced the analogy between it and the ecclesiastical and general history of the changes and development of the country.

The Rev. Canon Jackson, referring to the "restoration" of Stonehenge, said that all that was intended to be done was to lift up the trilithon which had fallen, and the proper place of which was well known.

The Rev. Canon Jones gave a lengthy account of the ecclesiastical history of the town of Bradford-on-Avon, and the various churches and other objects of archæological interest which it contained, especially the Saxon church recently discovered. In the afternoon the members thoroughly examined the parish church, the interesting old Saxon chapel, the Church-house, the Shambles, the old Market-place, the site of St. Olave's Chapel, Kingston House, the chapel on the Town-bridge, the chapel and almshouses of St. Katharine, Tithe-barn, St. Mary's Chapel, and Christ Church, all of which were very ably described, and their leading points of interest were shown by the Rev. Canon Jones.

After the town had been thoroughly inspected, dinner was provided at the Swan Hotel, Sir Charles Hobhouse, bart., presiding; and, subsequently, a *conversazione* was held in the Town-hall.

The meeting was continued on Wednesday. The members started in carriages from the Town-hall, the first halt being made at Westwood, where the interesting little church was described by the Rev. Canon Jones, who traced the history of the parish from the early part of the eleventh century. He called particular attention to the remains of stained-glass windows. The next halt was at Stowford Manor-house, which was thoroughly inspected by the visitors, and described by Canon Jones. This old Elizabethan house is now in the occupation of Mr. James Wadman. The next halt was made at Farleigh Castle, the ancient residence of the Hungerford family. The old ruins and chapel were inspected by the party, but no description was attempted, as the time pressed. The next halt was made at Beckington, where luncheon was partaken of, after which the party proceeded to Seymour-court, and thence to Road Church. North Bradley Church was examined, and the party returned to Bradford about six o'clock. In the evening a *conversazione* was held in the Town-hall, at which an interesting paper was read by Sir Charles Hobhouse, bart., on "Some Account of Monckton Farleigh," and one by Mr. F. Shum, F.S.A., on "Some Notes on Gainsborough, and his connexion with Bradford."

On Thursday morning, the members of the Society met at the Town-hall, at ten o'clock, and proceeded in breaks to Holt. Thence they went to Monckton Manor House, and thence to Broughton Gifford Church. They next visited Great Chalfield Manor House, where the Rev. Prebendary Jones acted as *cicerone*, and explained that this was one of the finest manor-houses in England, and was built by Sir Thos. Tropenell, who died in 1490. In the little church adjoining the manor-house is a chapel built by Sir Thomas Tropenell, and at one time it was enclosed by a carved stone screen, which is now removed so as to form an enclosure to the church. The walls of the chapel, which are now only whitewashed, were once decorated with paintings representing some of the saints, and it was stated that they were whitewashed by order of a previous vicar, who found that the congregation paid more attention to the pictures than to his sermon! The outlines and some of the colourings of the figures are still visible, but it is the intention of the present owner of the property (Mr. Fuller, of Neston Park) to endeavour to restore them. The arms of the Tropenell (now known as the Trapnell) family are emblazoned on the cornice of the stone screen and at the intersections of the roof of the chapel, showing the quarterings with the great families in marriage,—the Percys, the Ludlows, and the Roches. Luncheon was given in a large tent to about 150 guests, when the president of the Society (Sir Charles Hobhouse) expressed the thanks of those present to Mr. Fuller for his kind and liberal hospitality on the occasion, stating that it was about twenty-four years since the visit of the Society to this ancient and interesting manor.

The party visited other places of interest, and in the evening the meeting was brought to a close.

FROM ABROAD.

Monument to Maximilian, Mexico.—A decree has been issued by the State Government of Queretaro, in Mexico, determining upon the erection of a monument to commemorate the execution of the Emperor Maximilian and the Generals Miramon and Mejia, the monument to consist of truncated pyramids.

International Exhibition, Shanghae.—It is reported that the year 1883 will witness an international exhibition in Shanghae, now in contemplation.

Archæological Discoveries, Carthage and Utica.—M. Herrison, who is said to have made important archæological discoveries in Carthage and Utica, is about to publish an interesting work on the subject. He arrived in Paris lately.

Beneck Prize.—The University of Goettingue has announced that the Beneck prize will be awarded to the best essay on the following subject, to be written in German, Latin, French, or English, viz.—"A general exposition of the development of the Italian people, entering into details to show what the plastic arts and the drawing of the Italians owe to non-Italian nations." The essays must be sent in before the 31st of August, 1883.

A BUILDER'S CLAIM.
WRITTEN ORDERS AND CERTIFICATES.

GOODMAN *v.* LAYBORN.

This case was argued on August 1st, before a Divisional Court, consisting of Mr. Justice Grove and Mr. Justice Lindley, and came before the Court on motion for judgment on the report of an official referee. Mr. E. S. Roscoe represented the plaintiff, the builder, and Mr. Woolf the defendant, the employer, a gentleman residing at Ramsgate. It appeared from the statements of counsel that this claim arose out of two contracts, one to complete certain houses at Herne Bay, and the other to alter a house at Ramsgate; there was also a third claim by the plaintiff for a small sum for other work, in respect of which the official referee awarded 8*l.*, and upon which no dispute arose. In the case of the Herne Bay contract the referee had awarded the sum of 27*l.* odd for extras, and to the finding the defendant took exception, on the ground that by the terms of the contract an order in writing should have been given, and, this not having been done, that the builder could recover nothing. It was contended by the plaintiff that the words of the contract, which were that no extra work should begin without a written order, referred only to the commencement of the work, and were not a condition precedent to payment for work actually ordered and done. As regarded the Ramsgate contract, there had also been no written orders, but the architect had received the builder's account for extras, had placed his own figures in the margin, and had thereby largely reduced the builder's claim. At the foot he had placed the amount of his calculation, and had before signing his name (W. G. Osborne) written "Balance due as per conditions, 125*l.*" It was contended by the plaintiff that this was a final decision of the architect, and that though the word "certificate" was placed in the contract, yet that in effect all that was required was a final decision, which this was. The employer also claimed penalties against the builder for the non-completion of the work within the time specified in the contract. The Court, in giving judgment, disallowed the sum claimed for the Herne Bay extras, on the ground that by the contract written orders were necessary, and that, no certificate having been given by the architect, their absence was a bar to the recovery of any sum whatever by the builder. As regarded the Ramsgate contract, they held that no particular form of document was necessary for a final certificate, as required by the contract, so long as it showed the final decision of the archi-

tect, and they considered that this document did away with the necessity for written orders, and they upheld the report as to the sum awarded for extras in respect of this contract. As to the penalties, the Court desired a further report from the referee as to the circumstances under which the delay in completing the houses took place, and referred the report back to the referee for further information on this point.

[This case clearly is another example of the stupidity of builders in not sticking to the terms of their contracts. They should refuse to do extra work without written orders, and should not trust to the good nature of their employers, which is not to be relied on. It is clear, too, that architects should always give written orders without being asked to do so by the builder; they thereby save their employers immense annoyance and expense, and, indeed, are only fulfilling their plain duty. But it is astonishing how they continue to give verbal orders for extras when the contract plainly requires them to be in writing.]

THE STREETS OF BERLIN.

Owing to the execution of the new system of sewers in the German capital, the length of the principal streets of the city has recently been exactly measured. The celebrated avenue Unter den Linden has a length of 1,350 mètres, or less than seven furlongs; Wilhelm-street, the head-quarters of the Ministries, is 2,000 mètres long; while the well-known Friedrichs Strasse has a length of 3,060 mètres, or not far short of two miles. Of the streets which extend beyond the limits of the city proper, Müller-strasse has a length of 3,600 mètres, Kurfürstendamm 3,925, See-strasse 4,085, Kaiserstrasse 4,215 mètres. The longest series of streets running in one continuous line with unbroken rows of houses is that of the Friedrich-strasse, with its continuations the Chaussée and Müller streets, the aggregate length of which is 8,440 mètres, or upwards of five English miles.

ART-UNION OF LONDON EXHIBITION OF PRIZES.

It was a very generally-expressed opinion amongst those who were at the private view in the Art-Union Gallery last week, that the selection of works by the prizeholders showed a great advance on that of former years. We hope that this may be taken as evidence of that improvement in the taste of its members, and that power of discriminating between good and bad works, which it has been the great aim of the Institution to effect. Certainly to those who recollect the time when Mr. Shayer's gipsies and donkeys, and the roast beef and plum pudding of Pidding and Clater entered largely into the annual gathering, the change appears very great.

The most prominent works having already been noticed when reviewing the galleries from which they have been selected, any lengthened notice is unnecessary. Still there are one or two points worthy of mention. We are glad to observe that sixteen works have been chosen from the Royal Albert Hall Gallery. If artists could be induced to send their works to this gallery when they have been accepted at the Royal Academy, but not hung for want of room, as in the case of a considerable number of pictures lately shown here, this would soon become an important exhibition, and artists would find their advantage in it. Amongst the works from the Hall specially worthy of notice are No. 31, "St. Michael's Mount, Cornwall," by Mr. Sydney Hodges; and two landscapes, Nos. 43 and 48, by J. Anderson, admirable for careful execution and finish, and the truthful effect of shadow on the surface of the water.

The work of greatest importance in the gallery is the "At last" of Mr. Arthur Stocks. An old dame has just received a letter from her son, or perhaps grandson, probably announcing that he was on the point of going into action, and now he unexpectedly arrives to "set her heart at rest." It is a work full of sentiment, and well and solidly painted, and it is to be hoped it will find a suitable resting-place in Quebec, whither it is going; it is rather large for a house of ordinary size.

Amongst the water-colours, the principal is "The Loss of the *Revenge*," by Mr. Oswald Brierly, which formed the subject of the engraving given for the past year. For effective treatment and truthful rendering of light and shadow on the surface of water, "The Ferry on the Trath," by Mr. J. J. Curnock is remarkable.

We have already called attention to the exceptionally liberal presentation work prepared for the current year's subscribers,—a series of five plates from Mr. Frith's well-known pictures, "The Road to Ruin."

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,223. T. Barnby, Birmingham. Folding or camp furniture. July 23, 1881.

3,250. D. Grove, Berlin. Steam cooking apparatus. July 25, 1881.

3,261. T. W. Helliwell, Brighouse. Making the glazing of glazed structures impervious to dust, air, and water. July 26, 1881.

3,276. C. E. Bulling, Camden-street. Adjusting the position of swing looking-glasses, sashes, doors, &c. July 26, 1881.

3,303. J. H. Johnson, Lincoln's-inn-fields. Manufacture of artificial stone and marble. (Com. by La Société Anonyme de Certaldo, Paris.) July 28, 1881.

NOTICES TO PROCEED

have been given by the following applicants on the dates named.

July 26, 1881.

1,252. J. W. Lewis, Halifax. Raising and lowering window-sashes, &c. March 22, 1881.

1,277. H. G. Grant, Manchester. Furnaces or stoves. (Com. by A. Prevot, Bergerac, France.) March 23, 1881.

1,327. T. Morgan, Charing-cross. Magazine heating-stove. (Com. by O. Elterich, Nuremberg.) March 24, 1881.

1,483. J. Ingleby, Manchester. Cocks, valves, &c. (Com. by R. Meyer, Breslau.) April 5, 1881.

2,442. J. L. Corbett & W. Lochhead, Glasgow. Taps or valves, &c. June 3, 1881.

July 29, 1881.

1,304. J. Rettie, Hatton-garden. Binding for scaffolding, &c. March 23, 1881.

1,309. A. C. Henderson, Southampton-buildings. Safety wicket and grating for street-doors. (Com. by J. M. A. Montclar, Paris.) March 24, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending July 30, 1881.

5,293. E. P. Alexander, Southampton-buildings. Furnaces and fire-places.

Instead of the usual fire-bars, rectangular perforated cast-iron gratings are used, which have ribs on them to lift the fuel up and allow the air to have free access. (Com. by C. Nikiphoroff, Paris.) Dec. 17, 1880. Price 6d.

5,295. W. Phillips, Leeds. Window-sashes, &c.

A vertical groove is formed in each sash-stile to admit a round metal rod which is pivoted in the centre of the sash-stile, and so arranged that it may be moved outwards, carrying the rod clear of the groove and into a recess in the pulley-stile, when the sash can be reversed. Dec. 17, 1880. Price 6d.

5,306. T. H. Goodson, Berlin. Automatic apparatus for preventing waste of water in water-closets.

The valve-box contains two check valves; the upper valve's stem buts against the underside of the closet seat. Between the two valves is a pipe leading to an air-vessel. On the seat being depressed the upper valve forces the lower valve on to its seat and prevents any more water passing to the closet basin, but allows it to enter the air-vessel, partly compressing the air. On the seat being raised the upper valve closes the supply-pipe and then raises the lower valve, when the compressed air in the air-vessel forces the water out and flushes the basin. Various modifications are shown. (Com. by H. E. T. Goodson, Berlin.) Dec. 17, 1880. Price 6d.

5,308. J. Wiley, Darlaston. Clips for gutter spouting.

The bar has the two ends bent downwards. A hole is formed near the top of each fork of the clip. The bar is placed in position by pushing each bent end horizontally through the holes, when they fall downwards by their own weight, and the bar cannot be blown or shaken out of its position. Dec. 18, 1880. Price 6d.

5,333. C. R. Stevens, Lewisham. Valves and shafts and caps and cowls for ventilating.

This is an improvement on patent granted on the 13th of December, 1877, in various minute details, which are shown in forty-two figures. Dec. 20, 1880. Price 10d.

5,356. E. de Pass, Fleet-street. Combined washstand and bath.

A lid is fitted to the top of the bath, hinged at the back in which a washing basin is fitted. (Com. by A. Avon, Paris.) (*Pro. Pro.*) Dec. 21, 1880. Price 2d.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

5,368. J. H. Owen, Dublin. Reversible cresset grate.

The cresset is hung on pivots, and has the front and back formed of bars while the sides are iron plates. Plates are arranged to slide in over the bars. The fresh coal may therefore always be arranged to be beneath the live fire and the smoke is consumed. (*Pro. Pro.*) Dec. 22, 1880. Price 2d.

5,414. A. C. Farrington, Shelfanger. Apparatus for giving alarm and securing doors, windows, &c.

The bolt is forced against a coil-spring. A catch is fitted to draw the bolt in, which, when liberated, is shot forcibly back by the spring, and can strike a gong, &c. (*Pro. Pro.*) Dec. 23, 1880. Price 2d.

5,424. H. Johnson & B. Stuart, Keymer Junction. Apparatus for pressing or moulding bricks.

A box mould is made with its sides and ends hinged, so that when removed from the outer die or box, the brick, &c., can easily be removed. Dec. 24, 1880. Price 6d.

5,439. H. Payton, Birmingham, and W. S. Dackers, Balsall Heath. Attaching door-knobs to their spindles.

The end of the spindle is split longitudinally at opposite sides. The square hole in the bush of the knob is divided by a partition into two parts. When the spindle is passed through the door, the knob is forced on the elastic forked end, which holds it tight. Dec. 24, 1880. Price 6d.

AWARDS TO JOURNEYMEN PLUMBERS.

The following is a list of the awards made in respect of the works sent by journeymen plumbers to the recent Exhibition of Sanitary Appliances at South Kensington. The judges, as appointed by the Committee of the Parkes Museum of Hygiene, were Messrs. John T. Bolding, W. Paton Buchan, A. A. Common, and S. Stevens Hellyer.

Awards of the First Class, for Special Excellence of Workmanship, were given to George Davis, J. W. Hart, George Macfarlane, and G. Taylor. For Excellence of Workmanship to John Wm. Fuller, W. T. Otway, Thomas Sheppard, and J. Vance.

Awards of Merit for Fair Workmanship were given to David W. Buchan, Thomas Cranston, Thomas Harrison, Edward Lyne, James B. Macfarlane, James Wood, John Wyse, and A. J. Nickels.

MONUMENTAL EXHIBITION, LISBON.

An Exhibition of the Monumental Art of Portugal is to be shortly opened in Lisbon. Official intimations have been made to the several civil governors of all the districts, in order that they may invite the municipal councils, parochial Boards, confraternities, and other establishments and corporations of that kingdom, to entrust to the committee appointed for the management of the Exhibition with such objects as may be selected by the agents of that committee out of those they may possess for the said exhibition, on condition of their being returned after its termination.

STRATTON.

Several improvements are being carried out on the estate of the Earl of Northbrook, K.G., at Stratton, near Winchester. The homesteads on some of the farms have been entirely rebuilt on approved principles, and the farm-houses remodelled. Only one pair of cottages has at present been erected; but more are contemplated. The whole of the farm buildings and cottages are built of bricks and local-headed flints pointed with black mortar. The cottages are covered with plain tiles, and the farm-buildings with slates, except those at the East Stratton Farm, which are covered with Poole's patent tiles. The whole has been carried out by local tradesmen from the designs and under the superintendence of Messrs. Raynbird & Sons, surveyors and land agents, of Basingstoke, who are also erecting other homesteads on the estates of Lord Templemore, at Preston Candover, near Alresford; and of Mr. W. W. B. Beach, M.P., of Oakley Hall.

Art Exhibition at Brussels.—The Triennial Exhibition of Painting and Sculpture was opened on Sunday afternoon at the Palace of Fine Arts, in the presence of the King and Queen. The Exhibition, which is large and varied, is reported to maintain the honour of the Belgian school. There are also many pictures from France and Germany.

OBITUARY.

Mr. Selim Rothwell, Artist.—The death of this gentleman was sudden, and is said to have been expedited by his exertions in getting up an exhibition for the benefit of the new infirmary at Bolton. Mr. Rothwell was born in Bolton in 1815. His father, Mr. Edward Rothwell, was a house-painter and decorator. Mr. Selim Rothwell was educated at the Bolton Grammar School, and was afterwards trained in his father's business, being taught the art of drawing at the Mechanics' Institution. He was a pupil of Mr. George Berry, the drawing-master of that town, a man of considerable ability and a friend of the late Charles Swain. On his removal to Manchester, about twenty-five years ago, whilst continuing to practise as a drawing-master, he became in an increasing degree a landscape-painter. The charm of Mr. Rothwell's drawings of the buildings of Italy was widely acknowledged. Brittany and Normandy were also favourite resorts. Besides wielding the brush with skill, Mr. Rothwell was an enthusiast in the use of the etching-needle. He was one of the early members of the Manchester Academy of Fine Arts, and his business capacity and the esteem in which he was held by his colleagues gave him an active part in the management of its affairs, first as a member of the council, and latterly as its literary secretary. In 1877, he printed for private circulation a small volume entitled "Scraps from an Artist's Sketch-book." It contained some of his Continental impressions, and was illustrated by photographs from his drawings.

SURVEYORSHIP ITEMS.

Witney.—A meeting of the Highway Board for the Bampton East Division was held a few days ago for the election of a road surveyor for the district, in the room of Mr. W. A. Richards, resigned. The value of the appointment is 120*l.* There were upwards of thirty candidates, five of whom were selected for final decision. The ultimate result was the election of Mr. Jasper Taylor, inspector of nuisances to the Witney Rural Sanitary Authority. The voting was as follows:—Taylor, 16; Hemmings, 4; Richards, 3; Wells, 0; Bailey, 0.

Horsham.—We see by the report of Special Sessions, held at Horsham on the 23rd ult., that Mr. Charles W. Whitaker, C.E., of 6, Great George-street, Westminster, was elected County Surveyor for West Sussex. Mr. Whitaker is the son of Mr. Thomas Whitaker, late County Surveyor for Devon, and City Surveyor for Exeter, and is carrying out the drainage and waterworks at Budleigh Salterton, drainage of Chard, and other works in the West.

FURTHER SALES OF BUILDING LAND AT STREATHAM, WILLESDEN, AND WOOD-GREEN.

Within the last fortnight there have been several large sales of freehold building land in different parts of the suburbs of London. A few days ago Messrs. Debenham, Tewson, & Co. offered for sale a portion of an estate at Streatham, containing about nine acres, which has been laid out for building upon. The estate is close to Leigham Court-road, and within a few minutes' walk of the Streatham Hill, Tulse Hill, and Lower Norwood Railway Stations, the site commanding some beautiful and extensive views. The several plots have frontages of 25 ft. to a new road called Knollys-road, 50 ft. in width, and from 200 ft. to 250 ft. in depth. The stipulations provide that no house is to be erected on any plot of a less value than 600*l.*, nor within 20 ft. of Knollys-road. No tavern or hotel is to be erected on the estate, and it is also provided that no business whatever is to be carried on on any plot. The sale took place at the Greyhound Inn, Streatham Common, when there was a large attendance, twenty-four plots being disposed of at an average of a little more than 5*l.* per foot frontage, or about 125*l.* each. The entire proceeds of the sale amounted to 3,200*l.*

Messrs. Croucher & Co. offered for sale, at the King's Arms Hotel, Wood-green, a portion of the Alexandra Estate, which was stated to be bounded on two sides by the pleasure-grounds of the Alexandra Palace, with good railway accommodation, the estate being in close proximity to five railway stations. The drainage was said to be constructed on the most approved sanitary principles, and in accordance with the requirements of the local authorities. The several plots have frontages of 20 ft., with a depth of from 100 ft. to 130 ft., and were stated to be suitable for the erection of shops, and other residences. Thirty-five plots were sold at prices ranging from 60*l.* to 75*l.* each, whilst a corner plot, having a frontage to Crescent-road of 110 ft., and to Albert-road of 59 ft., realised 153*l.* The sale altogether produced 2,450*l.*

Messrs. Baker & Son also sold at the Auction Mart, fifteen acres of freehold land in Harrow-road, Willesden, which realised 4,380*l.*

AMERICA.

The *Scientific American* (New York, July 23) devotes half a page to the aqueduct over the Cabin John Creek conveying the Croton water to Washington. This bridge, which is a single span of 220 ft., with a height of 101 ft., is stated to be the largest masonry arch in the world. It seems surprising that a work of such magnitude should not be better known; but the explanation given is that it was completed during the Civil War, and that at the time it was considered unadvisable to draw the enemy's attention to the means by which the capital received its supply of water.

A description is given in this number of the new town which has sprung up a few miles south of Chicago, under the auspices of the Pullman Palace-Car Company. In June last year, the site of what promises to be a large and prosperous community was a broad stretch of prairie; but to-day the town of Pullman presents an appearance superior to that of any manufacturing centre in the States. It contains a handsome railway station, workmen's dwellings, constructed with every consideration for convenience and health,—a park,—beautifully laid out,—a large hotel, market-hall, stores, arcade, &c.; whilst an art-gallery and public library are in course of construction.

"Art on the Stage" is the title of an interesting paper in the supplement of the same date, on scene-painting. The materials used and the system employed in this much-ignored but really important branch of painting are explained at full length; and hints are given for the employment of tin-foil, bronze powders, and leaf-metal, which can hardly fail to be of value to decorators who have to look more to scenic effect than to careful painting for close scrutiny.

GET ORDERS FROM PRINCIPALS.

KAY *v.* ROBERTS.

In the Salford County Court, before Mr. J. A. Russell, Q.C., Mr. Kay, plumber and glazier, Prestwich, sued Mr. C. J. Roberts, solicitor, of Rochdale and Manchester, for 13*l.* odd alleged to be due for work done in the erection of certain cottages at Prestwich. Mr. Bradbury, barrister-at-law, appeared for the plaintiff; and Mr. Hockin for the defendant. It was stated by Mr. Bradbury that in 1879 Mr. Roberts was building seven cottages at Prestwich, that a man named Joseph Buckley was employed by him to superintend their erection, and that Buckley on defendant's behalf applied to plaintiff to tender for certain plumbing and glazing work required to be done. Plaintiff sent in an estimate, which was accepted, and did the work, for which he was paid by the defendant. These particulars were mentioned in order to show that Buckley was evidently defendant's agent in the matter. Subsequently defendant erected six other cottages,—or five and a shop,—at the same place, and in October of last year Buckley came again to plaintiff and asked him to send in a tender for the plumbing and glazing. Plaintiff sent an estimate accordingly to Mr. Roberts, offering to do the work for 16*l.* 10s., and he engaged, if it was determined to make a shop of one of the cottages, to glaze the window for three guineas. Two or three days afterwards Buckley told the plaintiff that Mr. Roberts had accepted the tender and desired him to do the work. Plaintiff did the work, including the glazing of the window for the shop, and he also did certain extras, the charge for which was now in dispute. In the November following plaintiff received 3*l.* on account, and in December 2*l.* additional. On the 27th day of December plaintiff called again on Mr. Robert, for the purpose of receiving another instalment, but did not get one. On the same day, however, defendant wrote to him enclosing a cheque for 8*l.* on account. Plaintiff sent in his account again on March 27, and then for the first time he heard that Mr. Roberts disputed his liability for the work. In a letter which he had written he said that it was Buckley who was to pay, and that at the time he was not a principal in the matter, but the guarantor of Buckley. That, it was contended, was not so. Plaintiff was called, and gave evidence in support of the statement made by the learned counsel. His Honour asked him who gave the orders for the extras. He replied that he received them from Buckley; and in reply to another question, added that Buckley never told him that he had Mr. Roberts's instructions for those extras.

Mr. Hockin put in a document showing that Mr. Roberts had limited his liability to 16*l.* 10s. which had been paid.

His Honour said that the plaintiff should have obtained orders direct for the extras from the defendant, and that there could be no implied authority. He directed a non-suit to be entered. This was said to be a test action.

THREATENING A BUILDER.

At Westminster Police-court, John Davis, 64, labourer, of 31, Romney-street, Westminster, was charged before Mr. Partridge with demanding money with menaces from Mr. David Walker, at Johnson-street, Westminster.

Mr. Walker, manager to the prosecutors, Messrs. M'Lachlan & Sons, builders, of Johnson-street, Westminster, said that morning the prisoner, who was a stranger to him, came to the office and asked to see one of the firm. He gave no name, and on being asked what his business was, he said he wanted to see Mr. M'Lachlan about the concrete work at the British Museum. It was not "put in" as specified, and unless it was made worth his while it would have to be taken out again. The prisoner also said that it would cost the firm 50*l.* to take it up and alter it. The witness asked him who he was, and whether he had been working on the job. The prisoner said he had not, he was a Government inspector, and had access to the place, and had been there eight or nine times. The witness asked him what he expected, and the prisoner said, "I will leave that to you; give me something and you shall hear no more about it." In reply to a question from the witness as to what Governmental department he represented, the prisoner said he came from Woolwich. In reply to the magistrate the witness said the firm were building a new gallery at the British Museum, and great part of the site was concreted.

The prisoner denied that he made any demand for money. Instead of the builders using concrete at the Museum, they had used old brick rubbish, and covered it over with a thin layer of concrete. The contract stated that they should put in a layer of 7 ft. of good concrete, but in some places they had not covered the old bricks and rubbish with more than 4 in. It was a disgraceful piece of work, and ought to be looked into.

Mr. Partridge remanded the prisoner, consenting to accept bail,—one surety in 20*l.*

CONDITION OF FAREHAM.

A correspondent to be relied on, signing himself "Quæstor," makes some serious statements as regards the sanitary condition of Fareham,—statements that show the necessity for immediate interference on the part of the Board of Health. The sewage is poured into the upper part of Portsmouth Harbour; the sewers are partly choked, so that in the principal street when there is heavy rain the contents of the sewers find their way back into the cellars of the houses; the burial-ground is full, and the water supply contaminated. This is brought about, he says, by the pernicious system of supplying closets direct from the water main. "All the water-closets of the small houses, and all the servants' closets of the large houses, with few exceptions, are supplied from the ordinary house supply, without an intermediate tank. Anything more disgusting as well as dangerous cannot well be conceived. When the water is stopped, as it is every night and once or more in the day time, the water receding in the pipes supplying closets sucks in the foul air direct from the closet-pans, and any water remaining in the main or subsidiary pipes is impregnated by this poisonous element, and the poisoned liquid is the first supplied to the houses when the water is again turned on at the waterworks. Any person drinking, say, half a pint of this deadly mixture, which he might readily do if he happened to draw for that purpose the first water in his house when it was turned on afresh, would certainly be very ill, if he did not die outright. Should there be an epidemic in the town, such as cholera or typhus fever, the germs of those fatal diseases would be spread through the town with fearful rapidity from the source mentioned, and from the causes dealt with in this letter nothing can be more probable than an epidemic."

The Local Government Board ought to be applied to if the Fareham Board do not move immediately.

MODERN STONE-CARVERS.

Sir,—At Kansas City, in Western America, more thousands of miles from my pleasant home at Exeter than I am prepared, at the present moment, to quote off-hand, I have just received a pile of *Builders*, and have, amongst other matter, been much interested in the perusal of a paper in one of them upon "Monuments" (the *Builder*, June 11, 1881, p. 741). Exception, however, I think, must be taken to the statement therein that "many of the best stone-carvers at work here" (in London) "are Italians, and the most expert amongst the English ones have studied in Italy"; and again, further,—"At present the phenomenon of the employment of foreign stone-carvers to execute works comparatively simple may, perhaps, point to some deficiencies in our art and technical schools."

The writer of the above is assuredly in error. The best stone-carvers in London are *not* Italians,—they have not studied in Italy, and when comparatively simple works are executed in London, foreign stone-carvers are not employed to do them. Messrs. Farmer & Brindley, Thomas Earp, James Forsyth, and numbers of other good men in London, are daily doing the best possible work, and those in their employ are, as a rule, honest Britons, not one out of hundred of whom were ever nearer to Italy than Saffron-hill! An ordinary percentage of foreigners exists amongst carvers, just as they do amongst all other trades, but the assertion that the highest class or any class of stone-carving in London is in the hands of Italians, cannot be too emphatically denied.

I have always been a rolling stone, and at the present time I find myself, as a relief from business, taking a holiday through the United States. Twenty years or so ago, at this time, I remember I was in Italy earning a miserable pittance there as a carver,—for wages were dreadfully low at the time. I recollect the jealousy of my fellow-workers, and that oftentimes a beetle-browed Italian would scowl darkly, and taunting me with "taking the bread out of his children's mouths," would go through the pantomime of stabbing me. I used to laugh,—for an Englishman's fist is better than an Italian's knife any day of the week. But the incident goes to show what different treatment is received by the Englishman in such countries as Italy and Spain to that he generously bestows upon those he receives in hospitable England.

During the time I was at work in Italy, and I went from one end of it to the other, I saw nothing to suggest that the modern Italians, as a race of workmen, were ahead of, or even level with, the English. The present generation in that sunny land, indeed, pride themselves rather upon the remembrance of past greatness than upon the possession of present skill.

Let any reader go to the first good job he may know of in London where stone-carvers are at work, let him question the artists themselves, and I will guarantee that he will not find more than one Italian in every twenty men.

Harry Hems.

UNFAIR COMPETITION.

Sir,—As one who tried for the surveyorship to a Yorkshire drainage commission, I received a reply that "an appointment had been made fo a gentleman who has long been officially connected with this drainage." Now, if competent, he, of course, is the proper person for them to appoint, and so far I am content to be an unsuccessful candidate; but does it not seem the height of injustice to put a large number of persons to the trouble and annoyance of getting together their testimonials and going through the empty form of an open competition, when, in point of fact, the Board had a suitable man at hand, and whom they, no doubt, always intended to select? The greatest annoyance to me is that I feel I have been "made a fool of"; but to some it is more serious, as, unfortunately, asking for a testimonial often disturbs the good feeling existing between employer and *employé*, creating an idea of discontent with his present lot, on the part of the younger man, which is often most unjust and injurious to his interest; and in the interest of all who are seeking to improve their professional position I must strongly protest against public bodies advertising for surveyors, &c., when they have already made an appointment among themselves. The advertisement in this case was, very strangely, not in your valuable journal, nor in any professional paper, but in local papers, and the qualifications were merely to survey, level, plot sections, and take the management of men, so that it did not appear at all necessrry to have been connected with drainage previously. Fair Play.

DAMAGE TO THE LANTERN OF WIMBORNE MINSTER, DORSET.

Sir,—All lovers of architecture and antiquity will be sorry to hear that another act of Vandalism has been committed at this church. The unique external Norman arcading, built of a local brown sandstone, is being repaired in white stone, destroying the whole beauty of the tower.

I am at a loss to account for the use of Bath stone. As a proof that this brown stone can still be obtained, and is used for building purposes, I may mention that Mr. G. E. Street used it in the building of St. Peter's, Bournemouth, and the church at Spokesdown.

Mills Robbins,
Hon. Sec. of the Bournemouth Field Club.

THE MELBOURNE AWARDS.

Sir,—It may support your own observations, and interest and instruct some of your readers, who, like myself, took honours at Sydney in the Art Section and failed to do so at Melbourne, if I ask you to publish the extract I append from a letter written to me by a highly-intelligent settler in Victoria, who takes great interest in art, and has done honour to the old country.

Architect.

"I did visit our Melbourne Exhibition, and but for the catalogue I should never find your contribution. It is situated on the staircase leading to picture galleries, among a group of architects' works; even with the catalogue I should not be able to find it had I not the help of an opera-glass. The staircase is not over well lighted, and this is high up. The *Australian* says that these works had to be put where they are for want of room. If the judges succeed in seeing its merits they must be very painstaking, and have splendid eyesight or good opera-glasses."—*November 27th*, 1880.

DAMP: A QUESTION.

Sir,—I have only to-day noticed a letter with this heading in your paper of the 30th ult. I think the solution is simple. The cellars should not be deeper than the drain-pipe. The water collects in the clay around and under the house, and in the dry weather the atmosphere draws the water out of the ground to the surface. In the wet weather the pressure of the atmosphere has a contrary effect. The occurrence is too frequent to warrant the term "phenomenon." An experienced man should have no difficulty in rectifying this trouble, but it would certainly entail some expense. J. Eberhard.

THE LANCASHIRE AND YORKSHIRE RAILWAY STATION COMPETITION.

Sir,—May I be allowed to call your careful attention to the very recent Lancashire and Yorkshire Railway Company's New Station competition, and the awards?

I have not time this week to forward you a truthful *exposé* of the whole transaction, but I promise to do so next week, when I think I shall be able to show in detail how unjustifiably the premiums have been awarded, and what (as I think) a gross injustice has been done to many very able men who sent in designs.

A Non-Competitor.

Miscellanea.

Friendly Meetings.—A desire for social intercourse on the part of members of the Council of the Royal Institute of British Architects has been prevailing, and with agreeable, not to say useful, effects. Mr. David Brandon, F.S.A., had sought to entertain at dinner on Monday last all the members of the Council, including the country members, but was disappointed to a certain extent in consequence of their absence from home, mainly in search of health and recreation abroad or in the provinces. A pleasant party, nevertheless, responded to his invitation at the Conservative Club, in St. James's-street, including the president, Mr. G. E. Street, R.A., Mr. Barry, Mr. Currey, Mr. Christian, Mr. G. Godwin, Mr. Hansard, Mr. l'Anson, Mr. Wm. H. White, with Mr. G. G. Adams, Dr. Christie, and other private friends, and an agreeable evening was, naturally enough, spent.

The Electric Light at King's-cross Station.—The King's-cross Station of the Great Northern Railway is now lighted by means of electricity, a beginning having been made last week. The peculiarity of the Crompton system (which was described by us some time ago) is that arc lights of large size are used, which are produced by self-regulating lamps, three or four being placed upon the same circuit. There are twelve Crompton lamps within the station, six being placed over the arrival platform, and a similar number over the departure platform. Two other lamps of larger size are placed outside the station building. The interior area lighted consists of two bays, each 880 ft. long and 105 ft. wide, and 72 ft. high, as well as the cab rank adjoining the arrival platform, which is 40 ft. wide. The total area lighted is 220,000 square feet, giving an area of 18,333 square feet, or nearly half an acre, to each lamp. The lamps are suspended at a height of 30 ft. from the platform level, and are arranged on four circuits, the light of each lamp being computed as equivalent to 4,000 candles. The illumination of the platform area is both uniform and excellent. The two exterior lights are estimated at 6,000 candles each, and are placed at an altitude of 70 ft., the lanterns being of clear glass. The current is supplied by means of five Burgin dynamo-electric machines, which are driven by a 12-horse-power semi-portable engine by Messrs. Marshall & Sons, of Gainsborough, working up to 35-horse-power, and having been designed and constructed specially for its present work. The shed in which the engine and machines are placed is about 250 yards from the nearest point of the station, and is lighted by the Swan electric light.

Decoration in the House of Commons.—Mr. Schreiber on Tuesday called attention to the unfinished state of the Central Hall of the Houses of Parliament, and submitted a resolution declaring that the decoration of the central hall, interrupted twelve years since, should now be resumed and completed in mosaics. The hon. member argued that public money would be well spent in decorations tending to promote the enjoyment of the people by appealing to their higher tastes. Mr. C. Bentinck argued that the taste of the present day was bad, and that all mosaics executed in recent times were failures, while he laid down the proposition that public money should only be expended as to matters of this kind in the purchase of well-known and well-established works of art, or else in the encouragement of British manufactures and British art, and generally of British interests. Mr. Shaw Lefevre admitted that it was desirable to complete the decorations of the central hall in a style worthy of its architectural beauty, but deprecated haste to fill up the empty panels without certainty that the works of art to be inserted came up to the highest standard. The fact that the subject had been in abeyance eleven years proved that the question was not one of urgency; and there was no such general assent upon the subject as made it desirable to ask for a vote to complete the decorations now.

Christmas Cards Competition, Suffolk-Street.—The prizes have been awarded, and a large number have again been obtained by the ladies. The first prize, 200*l.*, has been gained by Miss Alice Havers ("A Dream of Patience"); the second, 150*l.*, by Mr. E. K. Johnson ("Single Figures, Winter Scenes"). Messrs. Hildesheimer & Faulkner, the originators of the competition, have purchased a large number of the designs contributed, beyond those to which the premiums have been awarded according to the published particulars. Considering that the awards were made by Messrs. Millais, Marcus Stone, and G. A. Storey, after the designs were hung, it says something for the cleverness of those who hung them when we mention, that all the premiated designs are in the large room, and that these, with very few exceptions, are on the eye line.

Christchurch.—The Restoration Committee of the Priory Church, Christchurch, Hants, have appointed as their architect Mr. B. Edmund Ferrey, who recently examined and reported on the body of the building. The roof to the north transept will be the first portion of the work proceeded with, as it has been found to be in a very decayed and almost dangerous condition.

A Large Piece of Glazing.—Carlisle Citadel Station, which is glazed on Rendle's "Patent Indestructible System," has an area of 330,000 square feet. Messrs. Blythe & Cuningham were the engineers.

Nuisance.—The case of Bonner *v.* The Governors of Sutton Hospital was an action of nuisance, heard at the Croydon Assizes the other day before Mr. Justice Field. The plaintiff is a builder at Godalming, and had purchased some land on which he had erected some houses. The defendants, who are the authorities of Charterhouse School, are owners of some adjoining land, on which they had erected gas-works for the purpose of supplying the school building with gas. James Bonner, the plaintiff, stated that in 1869 he purchased the piece of land and built houses on it. One of the Charterhouse masters became tenant of one of them. Gas was first made in September, 1878. After the tenant in question left, the house remained untenanted for twelve months. The smell from the gasworks was very bad. For the defendants it was contended that the nuisance complained of had been greatly exaggerated. Mr. Louis M. Stuart, the tenant of the plaintiff's house, said that he took it first at 30*l.*, and afterwards at an increased rent of 45*l.* On the average, there were sixteen boys boarding in his house. He felt no inconvenience from the proximity of the gasworks. After some time the jury intimated that they had made up their minds that the gasworks were a nuisance, and judgment was given against Dr. Haig Brown, the head-master, the mode of assessing the damages to be settled by the learned judge in case of difference between the counsel on both sides.

Cottage and Window Gardening.—The first flower-show of the Shaftesbury-park Garden Improvement Society, of which Sir Trevor Lawrence, bart., M.P., is president, has been held. The society, which was only started some four months since, has for its object the encouragement of such humble floricultural efforts as may be practicable in the tiny plots of ground dignified by the name of gardens on the Shaftesbury-park estate, near Clapham Junction. The movement was originated and is being carried on by a few of the residents, who are for the most part artizans and mechanics; and, considering the short time they have been at work, the results already attained are described as very gratifying. Prizes were offered for the most attractive gardens, the best arranged windows, the best specimens of climbing plants on walls, as well as for plants in pots and out flowers. The schedule was carefully arranged, there being separate classes for gardens and windows with warm or cold aspects. A large number of competitors entered for all classes. Sir Trevor Lawrence visited the show in the afternoon and addressed those present, and in the evening Mr. J. Somervell, chairman of the committee, distributed the prizes, which consisted of books and articles, useful and ornamental; and a vote of thanks to the committee and secretary (Mr. B. Wynne) wound up the day.

Auckland New Cemetery: Tenders Accepted.—A meeting of the Burial Board for Auckland district was held recently, presided over by the Vicar, Canon Long. The architect for the new cemetery, Mr. Pritchett, of Darlington, reported that he had made inquiries respecting the contractors whose tenders were provisionally accepted at the last meeting, and the result was satisfactory. The tenders were then formally accepted as follows:—Mr. Carrick, of Durham, for road-making, draining, and laying-out; Mr. Ridley, of Tow Law, for mason's and plasterer's work; Messrs. Blackett & Beetham, for carpenter and joiner's work; Mr. Pollard, Bishop Auckland, for slater's work; Mr. Wouldhave, Bishop Auckland, for plumber and glazier's work; Mr. Willis, Darlington, for painter's work. The cost of the work is,—for fencing and gates, about 500*l.*; for roads, drains, laying-out, and planting, about 600*l.*; chapels, tower, and spire, about 1,450*l.*; superintendent's house, about 450*l.*; total, a few pounds under 3,000*l.*

Royal Polytechnic Institution.—Mr. Wm. Stokes is introducing some valuable new suggestions in his lectures here upon the improvement of the memory, and is explaining the practical application of his system for teaching the multiplication table by means of easily-remembered pictures.

Buildings for Dover.—It is proposed to erect a block of municipal buildings on the site of the old borough prison. The work, when completed, it is estimated, will involve an expenditure of at least 25,000*l.* Some of the local residents are protesting against the proposal.

Lambeth Palace Library will be closed for six weeks for the recess from August 29th.

The Chew Magna School Board have appointed Mr. E. Henry Edwards, of Bristol, architect for their new schools.

TENDERS

For new contagious wards, infirmary, &c., Doncaster Workhouse. Messrs. Wilson & Masters, architects. Quantities by the architects:—

J. Chambers & Son, Sheffield	£6,790	0	0
W. Anelay, Doncaster	6,290	0	0
Houldsworth, Bradford	6,165	0	0
Beastall, Doncaster	6,237	0	0
Illingworth, Bradford	6,150	0	0
Fidler, Chesterfield	6,056	0	0
Chadwick, Rotherham	5,898	0	0
Tomlinson, Leeds	5,767	0	0
Humphries & Moulson, Bradford	5,568	0	0
Arnold, Doncaster	5,544	0	0
Atkinson, Gateshead	5,535	0	0
Dennison, York	5,479	0	0
W. Smith, Sheffield	5,465	0	0
Nicholson & Son, Leeds	5,161	0	0
E. Meggitt, Thorne	5,119	0	0
Wortley, Kilnhurst (accepted)	5,100	0	0
Earnshaws, Rotherham	5,090	0	0

For the erection of boundary walling, Rutland Park estate, Sheffield. Messrs. Wilson & Masters, architects:—
J. Stone, Sheffield (accepted)

For the erection of eight houses, Nether Hall-road, Doncaster, for Mr. J. Brailsford. Messrs. Wilson & Masters, architects:—
Barker, Doncaster (accepted).

For the Doncaster Cemetery Extension, for the Cemetery Commissioners. Messrs. Wilson & Masters, architects. Quantities by the architects:—

Masonry, &c.

Stanley, Doncaster	£887	14	0
Athron Bros. & Gill, Doncaster	842	14	0
Barker, Doncaster (accepted)	703	11	9
Farnival, Doncaster	650	0	0

Ironfounder's Work.

Micklethwaite	372	0	0
Newton, Chambers, & Co.	312	0	0
Ratcliffe	297	0	0
Yates Haywood	282	0	0
Hatteraley & Co.	227	0	0
Whiteley	220	0	0
Crossley (accepted)	204	5	6

For taking out window-heads and iron columns, and building new stone piers at the Town-hall, Welshpool, for the Corporation of the borough. Mr. R. Hurst, architect:—

J. Potter, Welshpool	£205	0	0
J. W. Roberts, Welshpool (accepted)	190	0	0

For painting and decorating the assembly and tea rooms at the Town-hall, Welshpool, for the Corporation of the borough. Mr. R. Hurst, architect:—

E. Preater, Newtown	£140	0	0
J. Forse, Shrewsbury	93	3	0
J. & A. Smith, Welshpool	69	10	0
C. Lewis, Welshpool (accepted)	55	18	9

For building a dwelling-house at Welshpool for Mr. W. T. Parker, J.P. Mr. R. Hurst, architect:—

C. T. Pugh, Welshpool	£220	0	0
D. P. Jones, Welshpool (accepted)	202	10	0

For rebuilding the Three Tuns, Welshpool, for Mr John Roberts. Mr. R. Hurst, architect:—

J. Potter, Welshpool (accepted)	£493	0	0
D. P. Jones, Welshpool	487	0	0

For whitewashing and varnishing to inside, and varnishing to outside, at Board of Works Offices, Greenwich:—

Stevens	£130	0	0
Castle	103	0	0
Bailey	95	10	0
Hatfield	92	10	0
Lyon	85	0	0
Gillard	78	0	0
Pierce	71	10	0
Holding	68	0	0
Chapman	65	0	0
Davis	64	10	0
Gale	49	12	0
Challis (accepted)	45	0	0

For a new front and internal alterations to No. 84, Peascod-street, Windsor. Mr. T. V. H. Davison, architect:—

W. Bond	£378	0	0
W. P. Reavell	351	0	0
F. Akery	324	0	0
J. Willis	318	0	0
R. Bishop (accepted)	308	0	0

For the erection of a new Baptist Chapel, Adelaide-square, Windsor. Mr. T. V. H. Davison, architect:—
E. Knapp (accepted).

For new mahogany fittings for Mr. F. Gorringe's new premises, Buckingham Palace-road. Mr. J. T. Walford, architect. Quantities supplied:—

Trebel & Son	£2,570	0	0
Drew & Cadman	2,240	0	0
F. Sage (accepted)	1,950	0	0

For the erection of a house in Lewin-road, Streatham, for Mr. James Amsden. Mr. W. Paice, architect. Quantities supplied.

R. & E. Smith	£1,100	0	0
Sawyer	1,093	0	0
Downs	980	0	0
Young, Cochrane, & Frazer	893	0	0
J. O. Richardson	890	0	0
Smith	884	19	4
Thorner & Co.	876	0	0

For the erection of lodge to Intercepting Hospital, Queenstown, for the Cork Board of Guardians. Mr. D. J. Coakley, architect:—

Burke	£103	0	0
Flynn (accepted)	92	0	0

For the erection of [a villa residence at Ashford, for the Directors of the House Improvement and Supply Association, Limited. Mr. A. Bedborough, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Balaam, Bros.	£3,155	0	0
Howell & Son	2,620	0	0
Hobern & Co.	2,600	0	0
D. C. Jones & Co.	2,444	0	0
Naylar & Son	2,398	0	0
E. Vaughan	2,377	0	0
R. Avard	2,349	0	0
G. Parker	2,343	0	0
Wallis & Clements	2,274	0	0

For rebuilding the Grosvenor Arms, Grosvenor-street, Bond-street. Mr. W. Seth Payne, architect. Quantities by Messrs. Hoveden, Heath, & Berridge:—

G. H. & A. Bywaters	£2,760	0	0
J. Outhwaite & Son	2,703	0	0
J. H. Tarrant & Son	2,691	0	0
Robt. Perkins	2,647	0	0
E. Conder	2,600	0	0
Lathey Bros.	2,595	0	0
E. Lawrence	2,580	0	0
Richard Conder	2,535	0	0
W. Scrivener & Co., 8, Euroya-road, Regent's Park (accepted)	2,494	0	0

For alterations and decorations to No. 9, Upper Bedford-place, Russell-square. Mr. W. Seth Payne, architect:—
Broad & Son, 61, Kenton-street, Russell-square (accepted) £225 0 0

For building a pair of cottages, Norman-road, Leytonstone. Mr. W. Seth Payne, architect:—

C. Mansfield	£693	0	0
W. Buckle, Great Eastern-road, Stratford (accepted)	650	0	0

For a public-house, Campsbourne-road, Hornsey, for Mr. E. Hadgell. Mr. W. Bradford, architect. Quantities supplied by Messrs. J. & A. E. Bull:—
Brooks £2,750 0 0

For alterations and additions to No. 3, Leicester-street. Mr. W. Bradford, architect. Quantities supplied by Messrs. J. & A. E. Bull:—

Newton	£342	0	0
Ashwell & Co.	315	0	0
Garrett & Son	288	0	0
W. H. Smith (accepted)	288	0	0

For alterations and additions to No. 5, Lamb's Conduit-street. Mr. W. Bradford, architect. Quantities supplied by Messrs. J. & A. E. Bull:—

Newton	£195	0	0
Garrett & Son	183	0	0
Ashwell & Co.	347	0	0
W. H. Smith (accepted)	169	0	0

For alterations and additions to No. 1, Caterham-road Croydon. Mr. William Bradford, architect. Quantities supplied by Messrs. J. & A. E. Bull:—

Richardson	£330	0	0
Taylor	309	0	0
Scrivens	298	0	0
Wadney	292	0	0
Tegg	291	0	0

For rebuilding No. 3, Oakley-street, Bethnal Green, for Mr. T. Griggs. Mr. A. Stanton Cook, architect:—

Pritchard	£618	0	0
Thomason	540	0	0
Wire, Bethnal Green (accepted)	490	0	0

For works at Iver-grove, Iver, Bucks. Messrs. J. & J. S. Edmeston, architects:—

Lucas	£1,062	0	0
Nye	995	0	0
Jackson & Graham	960	0	0

For building new chapel in the Romford-road, Forest Gate, Essex. Mr. J. Wallis Chapman, architect. Quantities by Messrs. Goodchild & Son:—

Rickett	£4,100	0	0
Morter	4,031	0	0
Higgs & Hill	3,999	0	0
Lawrence	3,997	0	0
Abraham	3,797	0	0
Gregar	3,654	0	0
Hosking	3,597	0	0
Woodward	3,460	0	0
Taylor & Grist	3,129	0	0

For stable buildings and covered yard at Henstridge, Somerset, for the Improved Somerset Cider Company. Mr. E. Austin Cooke, architect. Quantities supplied:—

Richard Escott, Bridgewater	£2,131	0	0
Edward Abley, Salisbury	2,100	0	0
Stephens & Bastow, Bristol	2,091	0	0

For providing and fixing fire-hose and fittings at St. Marylebone Infirmary, for the Guardians of the Poor of the Parish of St. Marylebone. Messrs. H. Saxon Snell & Son, architects:—

Potter & Sons	£493	0	0
May Bros.	474	9	2
Benham & Sons	360	0	0
Shand & Mason (accepted)	350	0	0

For nine residences at Ravenscroft Park, Barnet, for Mr. Thomas Smith. Messrs. Brooking & Nelson, architects:—

T. Ennor, Julian, & Co.	£9,990	0	0
Dunford & Langham	9,844	0	0
Roberts	9,810	0	0
Grover	9,784	0	0
Marriott	8,499	0	0
Beale	8,444	0	0

For a pair of villa-residences, Worple-road, Epsom. Mr. J. Hatchard Smith, architect:—
Hopkin & Paine (accepted) £1,295 0 0

For farmhouse (exclusive of farm-buildings), Magdalen, Norfolk. Mr. J. Hatchard Smith, architect:—
G. Cousins (accepted) £2,100 0 0

For the erection of new schools and dormitories for the Guardians of the Brentford Union, Isleworth. Mr. Edward Monson, jun., architect. Quantities by Mr. F. T. W. Miller:—

		Deduct if sand and ballast raised on site.
B. E. Nightingale, Albert Works, Albert Embankment	£24,953	£312
Ennor, Julian, & Co., Marshall-street, St. George's-road, S.C.	23,900	550
Messom & Son, Twickenham	23,735	400
T. Hiscock, Hounslow	22,990	200
F. Taylor, Uxbridge	22,340	593
Henry Haynes, Alperton, Harrow	22,100	200
C. Claridge, Banbury	21,600	300
T. Beauchamp, Brentford-end	21,300	45
Joseph Dorey, Brentford	21,178	315
C. Maton, Kew, Surrey	20,426	429
T. Brunsden, Brentford (accepted)	19,424	400

For proposed new Synagogue, St. John's Wood. Mr. H. H. Collins, architect:—

Bywaters	£12,155 0 0
Mark	11,387 0 0
David King & Son	11,233 0 0
Bentley	10,983 0 0
Ashby Bros.	10,960 0 0
Croker & Co.	10,936 0 0
Abrahams	10,779 0 0
Langmead & Wray	10,678 0 0
Downs	10,672 0 0
Ashby & Horner	10,641 0 0
Brass	10,397 0 0
Merritt & Ashby	10,123 0 0
Kirk & Randall	10,095 0 0
Holland & Hannen, too late.	

For rebuilding Nos. 16 and 18, King's-road. Mr. Geo. Edwards, architect. Quantities by Mr. Henry Lovegrove:—

Lalley	£2,490 0 0
MacLachlan	2,480 0 0
King	2,443 0 0
Craske	2,352 0 0
Richardson	2,335 0 0
Gibson & Co.	2,328 0 0
Hickinbotham	2,298 0 0
Stimpson	2,220 0 0
Green (accepted)	2,098 0 0

For the erection of shop, &c., Bethnal Green-road, for Mr. Thos. Key. Messrs. Borer & Gathercoll, architects. Quantities by Mr. Henry Lovegrove:—

Jarvis & Son	£2,140 0 0
Ward	2,059 0 0
Staines & Son	2,052 0 0
Brass (too late)	1,993 0 0
Wire	1,980 0 0
Hunt	1,954 0 0
Smarman	1,950 0 0
Jackson & Todd	1,920 0 0
Sabey & Son	1,898 0 0
Sargeant (accepted)	1,895 0 0

For new roads, Nether Hall Estate, Doncaster. Messrs. Wilson & Masters, architects. Quantities by the architects:—

	No. 1.	No. 2.
Shelton, Sheffield	£2,558 0 0	£2,908 8 0
Spring, Sheffield	2,275 0 0	2,495 0 0
Jowitt, Brighouse	1,939 11 10½	2,059 11 10½
Haywood,* Wortley	1,850 0 0	2,064 0 0
Pugh & Morton (withdrawn).		

* Accepted.

For new roads, Rutland Park estate, Sheffield. Messrs. Wilson & Masters, architects. Quantities by architects:—

Thompson, Sheffield	£1,500 0 0
Hawke & Smith, Sheffield	1,500 0 0
W. Smith, Sheffield	1,170 0 0
Dickenson, Sheffield	1,137 0 0
Andrews & Spring, Sheffield	1,016 0 0
Haywood, Wortley	1,014 0 0
J. Stone, Sheffield	996 0 0
Skelton, Sheffield (accepted)	914 0 0

For new counter and pewterer's work at the Mason's Arms, York-road, Battersea, for Mr. E. Purchase. Mr. H. J. Newton, architect:—

Warne	£270 0 0
Heath	249 0 0
Hellings (accepted)	230 0 0

For alterations to the Stag, Brooksby-walk, Homerton, for Mr. Stephens. Mr. H. J. Newton, architect:—

Jackson & Todd	£634 0 0
Walker	623 0 0
Wood	567 0 0
Ashley	590 0 0
Hawkins (accepted)	462 0 0
Counter, &c.	
G. & J. Rogers	£182 0 0
Hellings	175 0 0
Heath	169 0 0
W. Rogers (accepted)	156 14 0

For the partial reconstruction and general repairs to about 250 ft. of 6 ft. diameter surface water culvert in the Pembroke-road, Hornsey. Mr. T. de Courcy Meade, surveyor:—

Dunmore, Crouch-end	£697 0 0
Rake	635 0 0
Pizzey, Hornsey	590 0 0
Ford & Everod	578 0 0
Strahan & Co., Wood-green (accepted)	443 15 0

For alterations and additions to Single-ville, Maindee, Newport, Monmouthshire, for Mr. John Clarke. Mr. E. A. Lansdowne, architect. No quantities:—

Moulton & Brownscombe, Newport	£337 10 0
L. B. Moore, Newport	527 0 0
Jones & Diamond, Newport	521 0 0
Norwal, Newport	505 0 0
G. Morgan, Newport	450 0 0
S. Swanton, Newport	445 0 0

For completion of contract, known as No. 1, for Colliers' Hall, Cwm Tilery, Newport, Monmouthshire, for the South Wales Colliery Company. Mr. E. A. Lansdowne, architect. Quantities supplied:—

W. Jones & Son, Newport	£337 0 0
Morgan & Evans, Pontypool	324 0 0
G. Martin, Newport	239 0 0
Jones & Diamond, Newport	242 0 0
E. Giles, Pontrilas	268 0 0

For the erection of three houses on the Carrignafoy Estate, Queenstown, exclusive of railway gates and boundary-walls. Mr. D. J. Coakley, architect:—

Mallany, Cork	£1,150 0 0

For the erection of a pair of villa-residences, Cranbrook Park, Ilford, for Mr. G. Beazley. Mr. A. Stanton Cook, architect:—

Goldbold, Ilford (accepted).

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The Builder.

VOL. XLI. No. 2012. SATURDAY, AUGUST 27, 1881.

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Homer as an Architect: The Palace of Ulysses at Ithaca.

HE agreeable occasion for the present article is the reception of a *brochure* from our friend, M. Charles Lucas, of Paris, an honorary member and correspondent of the Royal Institute of British Architects. The subject is "Architecture in the Time of Homer, especially as illustrated by the Poet's Description of the Palace of Ulysses," and is extracted from the "Annales de la Société Centrale des Architectes." M. Lucas adverts to the study of the subject having occupied and consoled the leisure which for years was enforced upon French architects by the consequences of a great political reverse; but the study bore its fruit under pleasant circumstances when the results were brought before the profession at a congress of French architects, and in the hour intermediate between a distribution of rewards and a "confraternal" dinner. The style of the author has all the gracefulness to which the French language seems to lend itself as naturally as to lucidity of exposition, and exemplifies the amenities not only of professional but of international intercourse. M. Lucas refers to articles of the *Builder* on the same subject, June, 1870 (quoted and translated pp. 14, 37, 39, 41, 48, 51) with a frankness and cordiality which must not be allowed to mislead his readers as to the genuine independence of his own judgment and studies.

In an introductory notice the author gives particulars of a primitive house, excavated, "like a prehistoric Pompeii," in the volcanic island Therasia, in the Greek Archipelago. It was built very rudely of irregular blocks of lava, with mud only for mortar,—such things have been known even in historic times; some rooms had upper stories, but all the beams employed were undressed, retaining even the bark. The cut of the more important,—most important,—gate of Mycenæ from another work has the unsatisfactoriness of so many other representations. We would fain take this opportunity to urge that an accurate cast of this monument should be preserved in every architectural museum that pretends to instruct in the history of our art. The mouldings even of the pillar itself, as well as of the members above and below it, are given so differently in different engravings that some must be miserably falsified, and all uncertain. Not merely the degree of diminution of the shaft from above downwards, but even the fact of any diminution at all is placed in doubt by some drawings. It seems to be much slighter in reality than usually represented, and that in consequence of a peculiar optical illusion which few are aware of. The nature of this will become evident to any one who will hold up before him the drawing of even an Ionic column upside down: he will be surprised at the greater quickness with which the girth of the column will then seem to expand upwards. The same effect, let the natural philosophers and opticians explain it, will be experienced when the Ionic column of a portico is looked at from above,—let us say from the box-seat of a coach. If we may trust the profile given in a number of the *Archäologische Zeitung*, the mouldings of the capital are exactly those of the Attic base reversed; upon the verification of this more historical inferences depend than affect the development of architecture alone. It is time, however, to return to our proper subject. M. Lucas engraves three schemes for a restored plan of the palace of Ulysses. One is by Canina; another by Lechevalier, who, in 1829, writing under the pseudonymn of Constantine Koliades, revived an ancient paradox of the identity of the poet and his hero,—a Homer-Ulysses. Both these work upon the indications, reported by Sir Wm. Gell, of ruins upon Mount Aito, in Ithaca. M. Lucas justly styles these indications both scanty and questionable, and valueless as a check upon the descriptions by Homer. In fact, it cannot be too distinctly recognised that the poet gives such very inaccurate bearings for the island of Ithaca itself, that he could neither have been familiar with it personally nor have owed his information to others who were so. This state of the case will be found fully established in Bunbury's recent "History of Ancient Geography," a thoroughly standard work, if the Victorian era has one to boast of. The third plan, which has the advantage, at least, of being unhampered by restricting local conditions, is by H. Rumpf, and illustrated a Latin Essay, which we have not seen, published at Giessen in 1858.

What has to be treated of is, in fact, the conception of the poet. This, doubtless, may have been quite at variance with the real architecture of the remote epoch professedly dealt with, and also with the art as contemporary with the poet; but to this latter it must necessarily have been indebted for suggestions more or less extensive, as it must have been, in some degree, to his familiarity with traditions and monuments which, in his ancient days, survived from days that were still more ancient. In any case we are quite justified in expecting that his ideal conception will prove to have been both self-consistent and complete. It is a frequent experience of analysts of superior works of fiction, to come upon casual indications that an author had realised in his mind a scheme of local details or personal relations more minutely and scrupulously made out than he ever had occasion to define for the guidance of his readers. M. Lucas, unfortunately, does not supply an engraved plan to illustrate his own exposition; pursued, however, as it is, with excellent consistency and careful references and citations of the poem, it invites recurrence to the subject, and a summary of general results. It is to do honour to the candour of a *confrère* from beyond that Channel which now is a high road of happy intercourse between nations which it was long chiefly valued for dividing, that we reproduce his note of cordial acknowledgment (p. 37):—"C'est surtout dans cette troisième partie de notre travail (Le Palais d'Ulysse) que nous avons pris pour guide la savante étude parue dans le journal Anglais, *The Builder*; et nous sommes heureux de reconnaître que dans certains passages, nous n'avons fait que traduire et reprendre, avec l'archéologue Anglais, auteur de cette étude, le texte de l'Odyssée," &c.

If Homer assigns to Ulysses a palace in many respects of primitive simplicity, and even rudeness, it was not by any means because imagination was wanting,—or, it may be, familiar models either,—for furnishing his hero with a superb and luxurious dwelling. His descriptions of the palaces of Alcinous and Menelaus might have satisfied the author of "Lothair" for unsparing magnificence, and the employment of metals in their solid architectural enrichments is such as the so-called Treasury of Atreus at Mycenæ proves to have been suggested by executed works.

The ancients amused themselves by ungallantly reckoning up the age of the wife for whose sake Ulysses was fain to desert the society of goddesses. Ovid, from the depths of his cruel exile, though he felt its cruelty severely in the rupture of his own affectionate domestic relations, could murmur that the much-enduring man had, after all, no such hard lot in his separation,—*An grave sex annos teneram fovisse Calypso?* But the strong home-feeling of Ulysses is the great redeeming charm of a character which does not otherwise shine by the amiable virtues; and this is set forth in most engaging relief by his yearning for a homestead so contrasted with splendours and luxuries which he can despise for the sake of it, keen as is his eagerness for wealth in any form, and indifferent as he usually is as to how he comes by it. There is no sea-risk that he is not willing to incur, no perils afterwards that he cares to shun, if only he may see once again the smoke ascending from his native roof.

Let us call again to mind the general character and scheme of this dwelling so ardently longed for, as they come before us vividly in the revisal of M. Charles Lucas.

The home of Ulysses was a combination of palace, manor-house, and farm-house, in relation to which the homestead to which his aged father has retired is very much that of the home farm. His wealth, apart from a store of precious and useful metals and arms,—plunder obtained in war and athletic prizes,—consists very largely in stock,—beeves, swine, and goats; and with these we must include slaves of both sexes, captured or purchased. The account which Eumæus, the faithful swineherd, gives of his master's stock, both on the island and the main-

land, is extraordinary; we may safely say extravagant, for allowance has to be made for an old servant's unscrupulous concern for the dignity of the family. We are only brought into communication with swineherds, goatherd, and herdsmen; but there is clear reference to a number of men that might have mustered, if time allowed, from those engaged in cultivating the large royal demesne.

Outside and in near connexion with the palace was a prepared and levelled platform adapted for athletic but also sedentary games, and a general lounging-place: this was an arrangement which, treated architecturally, became either the Hellenic Palæstra or else a *lesche;* but it is clear from Homer's allusion to the beauty of the chorus or dancing place which Hephæstus constructed for Ariadne at Cnossus, that he was already familiar with application to such sites of study and embellishment at establishments more luxurious than that of the Ithacan prince.

The entire palace is contained within an outside wall, crowned with a coping where it is single, and of such strength and height as to secure inmates and contents from intrusion and violence. The main, and apparently the single, entrance into the enclosure, was through doors capable of being thoroughly secured, and wide enough to admit cattle and chariots; on the same front, exterior to the general wall, was some sort of porch or portico.

This entrance admitted to the *aule*,—a spacious courtyard, where the cattle brought for slaughter could be tied up or turned loose for a time; stalls and stables, when such were required, had their position here, but consistently with the ruggedness ascribed by Telemachus to the surface of his native island, there is no mention of the use of horses in Ithaca. This seems to have been the position of the outhouses, where the female servants were employed laboriously at the hand-mills to provide a supply of flour for the household. The droppings of the cattle removed from the *aule* were heaped outside the building, but not very far away, to await distribution over the estate. Lying neglected and weak upon the dunghill here, close to the gates, was the dog Argus, as Ulysses approached his home after twenty years' absence; the creature recognises him, disguised as he is, and, indeed, transformed in personal appearance by the goddess Athene.

"He knew his master,—knew and strove to meet,—
In vain he strove to crawl and kiss his feet;
Yet, all he could, his tail, his ears, his eyes,
Salute his master. . . . . .
The dog whom fate had granted to behold
His lord when twenty tedious years had roll'd,
Takes a last look, and, having seen him, dies,
So closed for ever faithful Argus' eyes!"

In the centre of the *aule* was an altar dedicated to Zeus as guardian of an enclosure. Unfortunately, no hint occurs to determine a special orientation for the building, which might explain an epithet, implying warmth, given to a corridor or open lean-to, which seems to have formed a covered way along one if not both sides of the *aule* from the main building to the outer doors. This *aithousa*, in any case, had greater importance on the side opposite the outer doors, and on each side of that which admitted into the dwelling proper.

This second entrance on the main axis of the building is identified by references to its threshold as of wood, in contrast to another, which is of stone or marble, in the further interior. Passing through it, the first *megaron*, or large apartment, was reached,—a spacious hall, and the ordinary haunt of the men, at meal-times especially, and otherwise. It was of an extent to accommodate very considerable numbers,—accepting the descriptions submissively, we may say some scores. On the occasion of a meal, seats and separate movable tables were arranged along the opposite sides of this for the guests; a fire could be lighted in it, of which the smoke escaped through an opening among the blackened rafters of the roof. How this roof was constructed does not appear; no occasion occurs for the mention of any pillars; one support is alluded to, by which Penelope takes her stand, in a manner that almost implies that it was as single as the central shaft of a chapter-house, but this is at the further end of the apartment. It does not even appear that the floor was either boarded or paved; indeed, there are indications that it was at best of beaten earth, capable of having a trench dug in it and to be cleansed by scraping with hoes. We hear nothing of a separate kitchen for the preparation of the flesh which is so freely consumed, with no mention of vegetables, either fresh or cooked; and the newly-flayed hides of the slaughtered beasts are lying about near the seats, where wine is being quaffed out of golden goblets. But it would be very rash to assume that the manners and customs of the poet's own age or a preceding are accurately represented by the picture which it suited his poetical purpose to compose.

This principal hall of the men was central between the *aule* and the more private and the peculiar feminine division of the house beyond. A central doorway, with a stone threshold, admitted to these apartments, of which the principal is again called a *megaron*,—a large work-room in which the numerous female servants were occupied with manipulation of wool, and where Penelope herself occasionally applied to the distaff and spindle. The best bedroom of Ulysses was on the ground-floor in this division, and there were underground storerooms for wine, oil, and meal, of which a discreet female housekeeper had charge. A yard of sufficient extent for a considerable number of poultry to be kept, was also within the enclosing wall, and answered at this extremity of the building to the *aule* at the other. The chamber usually occupied by Penelope is on an upper floor on this side, and in such proximity to the hall of the men that she has no difficulty in overhearing what goes on there; the locked treasury of Ulysses is also on this story. But between the enclosing wall and the lateral walls of both the great apartments, there was arranged, on one side at least, a service-passage of indeterminate breadth, with stairs, to rooms above it. This could be entered from the further end of the *megaron* of the men, and gave an issue into the *aule* near the door with the "wooden threshold." There was also access to it from the women's division, who were thus enabled to pass by the side door into the *megaron* of the men, which they put in order after an entertainment, and also to reach the *aule* and so leave the palace as required without traversing the central hall. They could also pass by it to such upper rooms as the armoury and others, for domestic purposes. Telemachus, for example, is lighted by his old nurse to his chamber, in a position whence he could look down over the courtyard and the entrance.

The general distribution has much agreement with that of the Greek house as described by Vitruvius.

When the seeming beggar, Ulysses, is pitted by the suitors against the beggar Irus in a boxing match, the fight "comes off" in the middle of the *megaron*, and the victor drags the vanquished bully by the leg through the vestibule, across and out of the *aule* and sets him up against the enclosing wall outside. When the crisis of the poem is at hand, and Ulysses is about to set upon the suitors, he provides for shutting off the women's apartments by the indispensable help of the housekeeper, as they have to be secured from within; and the herdsman who is with him is sent to preclude the possibility of interruption from without, by barricading the main entrance into the *aule*. Then he takes his stand with the fatal bow on the wooden threshold to defend the passage from the great hall into the *aule*, and at the same time to command the exit by the service passage which was close by; and then the massacre commences.

So it is that we have had satisfaction in going hand-in-hand with M. Charles Lucas in verification for the most part, of the results which he obtains by following the incidents of the Odyssey in order, and combining scattered allusions, epithets, and phrases. Like a genuine student, he does not withhold from inviting excursions along the margin of his main subject into collateral topics of illustration more or less immediate; these invitations are ever rife in classical antiquity, for the genius of the Greek asserted its originality in every art, and the same spirit which animated the literature was evidenced harmoniously both in architecture and in graphic design. In obedience to this impulse we are welcomely presented with a reproduction of the subject on an antique mirror representing an interview of Ulysses and Penelope. This is reproduced from the publication of the German Archæological Institute of Rome, but with the title there assigned and summary of explanation which miss the intention of the ancient artist. It is called "Ulysses relating his Adventures to Penelope," and as the dog Argus is introduced, which, according to the Odyssey, dies before this meeting, it was assumed that the artist followed one of the many lost cyclic poems. But this is to employ a random supposition with the effect of defrauding the designer of the mirror of the credit of an original poetical combination of considerable merit. He clearly had in his mind the incident in the Odyssey when the disguised Ulysses, his fictitious narrative of adventures already concluded, assures Penelope that her husband will return forthwith, while she, on her part, expresses all but absolutely her failure of hope. Ulysses wears the conical sea-cap which he appears in on a coin of Ithaca that M. Charles Lucas engraves, and that Flaxman has made familiar to us. Various disproportions apart, his attitude and gesture, as with fixed gaze he rests his right elbow firmly on his raised left thigh, and extends his index finger in a line with his profile, are admirably invented as expressive of firm conviction and positive assurance. Penelope stands opposite, erect, with folded arms, and one hand to her chin, wrapt in thought, absolutely reserved, if not absolutely incredulous. A Medusa head with a crescent, between the two figures, is a manifest symbol of the monthly term within which Ulysses limits the fulfilment of his assurance:—

"When the pale empress of yon starry train,
In the next month renews her faded wane,
Ulysses shall assert his rightful reign.
What thanks! what boon! replied the Queen, are due,
When time shall prove the storied blessing true?
My lord's return should fate no more retard,
Envy shall sicken at thy vast reward;
But my prophetic tears, alas! presage
The wounds of Destiny's relentless rage,
I long must weep nor will Ulysses come."

The artist of the mirror happily contrives to bring into one scene a contrast which the poet trusts to us to appreciate as presented in successive incidents. He introduces the dog Argus still alive, between the disguised husband and unconscious wife; if, indeed, unconscious, for the ancients disputed whether Homer did not intend us to surmise that the discreet Penelope suspected, or even was confident of more than she avowed or signified. While Penelope is standing almost statue-like, in true suspense or obstinately reticent, the dog, with infallible instinct, with ears declined and curving tail, looks up eagerly to his master, and even strives to attract his attention, fawning upon him with one uplifted paw. The cautious prudence of Penelope could scarcely be brought into better relief,—of the wife who at last, only at last, allows her hopes to become entire and affectionate confidence, when Ulysses intimates his knowledge of their private token. This was the absolute immovability of their bedstead. When Ulysses erected his palace himself, with the skill which he boasts of in all the useful arts of peace as well as of war, he roofed in his nuptial chamber about an olive tree which was growing on the site, and then, on felling it, had left the stump and framed into this the concealed woodwork of his couch, a secret known only to himself and wife and one confidential attendant.

It is difficult to return to the poetry of Homer at any time without lingering over it, and if this is ever excusable it is under the sympathetic circumstances which have prompted the present article.

PATTERN-BOOKS.

The production of books which are intended to supply patterns of work or of design for the use of those who cannot produce their own designs seems to be a type of industry that is much on the increase. Under the general term "pattern-books," which we admit we are here using in a sense of our own, we include all those publications which present collections of designs which have not been executed, but which are published ostensibly for people to "crib" from. Very often the real and primary motive of publication is to furnish a kind of genteel form of advertisement of their author, but the professed end, at all events, is that which we have indicated.

How far such publications are really of value depends partly on the class of object with which they deal. When they are designed to illustrate what is purely artistic work, it appears to our judgment that such books are entirely useless, and even injurious, except in the purely business light of making known their author's name. In any other respect the only result of their use, if they are used, is to encourage the habit of repeating borrowed designs without thought or study. The artisan who uses such a book is merely mechanically copying designs which, even if good in themselves, are not designed for the situation on which he uses them, and the

use of which can hardly be said in any way to stimulate his own taste or knowledge. It is merely parrot work.

The production of works of this kind is, in fact, an indication of a radically wrong notion as to the production of ornamental design. It assumes that certain forms are in themselves art, that they can accordingly be reproduced as art. This, of course, is absurd. Artistic design consists in the exercise of individual thought and taste in the application of well-chosen forms to decorative effect. But to publish the results of such thought for others to use over again is simply to vulgarise them. The idea that decoration can be of any value when borrowed second hand out of a book in this way, is no more reasonable than to suppose that a man can be a good orator by borrowing from a book of selections from another man's speeches.

We do not, therefore, regard such publications with any particular favour, though we may distinguish between the relative qualities of one and another. The last contribution to the list comes to us from Birmingham,* in the shape of a work in four parts (two only are before us) bearing the fashionable title of "Motifs for Decoration," and consisting of plates of designs mostly founded on Japanese taste, or, in some cases, what we might call Japanese crossed with Gothic. The author's preface is amusingly unsophisticated. He says that, knowing practically the requirements and taste of the present period, he has adopted what appears to be the best method of drawing, in the various popular styles, so that, "with comparatively small artistic knowledge, the designs may be adapted to all processes." We had not read this sentence when we wrote the above introductory remarks; it certainly forms a singularly appropriate comment on them. Here is the absolute suggestion, in its naked form, that the decorations given are to supply the place of artistic knowledge, and to be reproduced in any material; quite ignoring the intimate connexion between decorative style and material. The author assumes in the first paragraph of his preface what is certainly not in accordance with facts. He says his aim has been to give a series of suggestions that will readily lend themselves to the various processes of art manufacture; that he has frequeatly felt the want of such suggestions; many of his friends have experienced the same deficiency. Why, there is actually a glut of "suggestions" for ornament of the very highest order in the ornamental work of the past collected in our museums, as well as in such great leading illustrative works as those of Owen Jones and others. Why did not the author publish accurate illustrations of existing ornamental work, and so do a real service to students by disseminating drawings of good work, of historical value, for the benefit of those who were out of the reach of museums? He would then have brought his readers into connexion with typical examples first hand. As it is, a large proportion of his examples are simply Japanese art at second-hand. If they had been careful copies of actual specimens of Japanese work they would have had a distinct and definite value, though a value which it is quite possible to overrate.

As to the actual merit of the illustrations, they are in a good and tolerably bold style of drawing, and in some cases are very effective. The circular panel with the bird (Plate IX.), for instance, is a good bold bit of drawing and design. But then this, and others that are also effective, are nothing but sham Japanese work. The author seems in some cases to have adopted the heresy which Japanese art has (whether logically or not) suggested to many designers in this country, of thinking that it is a good element in design to make everything look as accidental as possible. For instance, in Plate VI. there is a long strip of panel up the centre, with a small diaper on it and circular pateræ of different design placed on the diaper; the said pateræ all at irregular intervals, and all placed so that some part of the disc, less or more, is cut off by the border of the panel. To call this sort of thing "design" is utterly absurd; it is the ignoring of design. "Design" implies contrivance and adaptation, not the complete ignoring of anything of the kind. Another fault is want of homogeneous style; as in Plate II., where sunflowers are decoratively treated, the flowers are conventional, and the leaves nearly natural. This is a fatal error in design. Whatever degree of conventionalism be adopted, it should be carried consistently throughout every detail.

There is another kind of pattern-book which is more useful,—that which combines constructive detail with design. To publish illustrations of the method of constructing and putting together any kind of work, decorative or practical, is always calculated to be useful. Practical knowledge can be imparted by examples; power of design cannot,—not in the same sense, at least. This element in pattern-book making is to some extent illustrated in a portfolio, rather than book, of very awkwardly large sheets, which comes to us from across the water, from Bridgeport, Connecticut, under the title of "Palliser's Useful Details."* This is a joiner's book, and gives a great amount of details of woodwork, designs for gates, railings, &c., accompanied by a good deal of practical detail, such as handrailing diagrams, &c., and nearly everything shown has its section and constructive detail appended. There is nothing to remark on in the constructive portion, which seems to present the ordinary details of joinery, neither better nor worse than are usually followed in the ordinary routine of work; in one or two places there seem to be oversights or omissions, such as the want of throating to a window-sill, unless it is that the drawings, which are rather thickly and roughly printed, do not show it clearly. A good many of the designs, we are told, have been actually carried out, which, of course, actually places the book in a different category from that of mere suggested designs; there is, for example, a plan of the arrangement and constructive details of a shop, which occupies a whole sheet, and there are other such details which may fairly claim to be "useful." Still the object of the work, in the eyes of its producers, is mainly artistic, and in this sense it is rather significant in some ways. In the preface it appears that the aim of the author or authors is very ambitious. They propose to bridge over the gulf between the architect and the inartistic builder and workman by inoculating the latter, so to speak, with the virus of architectural taste. They feel that, owing to the great changes which have taken place in architectural taste "during the last three or four years," the architect and builder have been thrown more apart, and the latter does not at once understand the new ideas of the former, and thus is not only unprepared to carry them out properly, but often is not able to correctly estimate the cost of such new and unaccustomed work, and either estimates too low or too high. Now, when we read this, and we learned also from another paragraph of the preface that it was the special desire of the authors and publishers to keep pace with the times, we turned with some interest to the illustrations to see what was the new taste with which the architects of Connecticut had been endowed. And behold! we find all our old friends of fifteen or twenty years ago in England; the cunningly-chamfered posts, the panels and brackets with patterns pierced in them in round holes and otherwise; the chamfered boarding placed diagonally across the doors, and all the things which characterised average modern Gothic woodwork in this part of the world nearly a quarter of a century ago. Thinking of the phrase "the last three or four years," we turned to the title-page for the date of the book, thinking it was possibly an old work surreptitiously put upon us for a new one; but no, there was the date "1881" plain enough; the only thing that seemed to offer any solution of the puzzle was the date of the month, "First of April." Seriously, however, we presume the conclusion must be that it takes from fifteen to twenty years (allowing for "the last three or four years") for fashions in taste to travel from England to Connecticut, so that about the year 1891, or from thence to 1895, we may expect a book of designs in Queen Anne style from the same place. Far be it from us to assume that our cousins in the States should do nothing in architecture but imitate our fashions, we would rather urge them to avoid mere imitation; but at the same time it seems to be the fact that they do imitate us, and most of the books of designs or buildings that come over to us from the States consist of repetitions of English architectural taste. It is perfectly natural, it is according to the universal course of architectural history in the past, that a race who migrate to a new country should carry with them the architectural traditions of the old country; but then they should leave themselves free to make their own start from these. They should not keep looking back to the old country to note all the changes in fashion there and follow them. In the illustrations we are speaking of there are certainly forms that are new in a sense; but, unfortunately, they are by no means admirable, and are just the kind of things that are produced in the effort to be novel for the sake of novelty, which is always a dangerous experiment.

* "Motifs for Panel and other Decoration." By John Ward. Birmingham, 1881.

* Palliser's Useful Details: Vol. I. Palliser, Palliser, & Co., Bridgeport, Connecticut. 1881.

OBSERVATIONS ON BANKRUPT ARCHITECTS AND THE RIGHTS OF CREDITORS.

It is the lot of every profession for some of its members from time to time to find themselves involved in money difficulties, and architects are not an exception to this general rule. Sometimes an inability to meet in full the demands of creditors may arise from misfortune; sometimes, and more often, from carelessness in the conduct of business. Indeed, the larger does the experience of a man who mixes much among all classes of the community become, the more does it become evident that but few of the so-called pecuniary misfortunes which occur are the results of the inevitable. Want of foresight, a reckless independence of opinion, a desire to make money quickly and not surely, and a want of self-restraint, are the too general causes of pecuniary losses. However, be that as it may, we are now concerned chiefly with facts of a business-like character, and not with the causes of men's misfortunes, and it is in regard to certain facts of considerable importance to architects and their creditors that we now desire to say a word or two. The question, briefly put, to which we wish to direct our readers' attention, is the position of an uncertificated bankrupt architect in relation to his earnings, and this point has been brought somewhat prominently forward of late through the litigation arising out of the construction of a new theatre in the Strand, and especially by the recent case of Emden *v.* Carte, which was tried before Mr. Justice Fry. The exact point arose in this case, and therefore it may be considered as the latest authority which bears on this question, and directly affects the architectural profession. Mr. Emden, an architect, to touch briefly on the facts, brought an action against Mr. Carte in respect of an agreement to employ him as an architect; the main claims were a sum for remuneration for work and damages for a wrongful dismissal, and at the time when the action was begun the architect was still an uncertificated bankrupt. The actual question was raised by an application on the part of the trustee to be substituted as plaintiff in the action in place of the architect.

Now, the legal rule upon this point is shortly this, that the trustee has not a right to the proceeds of a bankrupt's personal and daily labour, for that would be to deprive him of the means of existence. But though this rule is pretty clear on its face, when it comes to be more closely examined it will be seen not to be very easy of application. For what are the proceeds of a bankrupt's personal and daily labour, and what, strictly speaking, is this personal and daily labour? Thus, in one instance, a discussion arose in the courts as to whether a bankrupt or his trustee was entitled to the damages recovered by a newspaper editor for a wrongful dismissal, which certainly was money received in respect of the loss sustained from the breach of a contract in which the elements both of personal and of daily labour were present. In the present instance, the claim of the trustee was also held to be good against that of the bankrupt architect; for, said Mr. Justice Fry, "The conclusion, therefore, at which I arrive is this, that although the personal services of the architect were an inducement to the contract, the fruit of that contract in the way of remuneration or the right to damages for wrongful dismissal would pass to the trustee." And it must be observed that in thus delivering his opinion the judge is careful to insert the words "in the way of remuneration," showing that it was clearly his intention to lay down the rule that whatever an architect might earn by his daily labour in his profession became the property of the creditors as long as he remained an uncertificated bankrupt. Indeed, so far as the creditors are concerned, it would be a hardship if it were otherwise; for the architect's knowledge and professional skill are his capital as much as the actual cash or bills of the merchant, and were it otherwise an architect might become

bankrupt with but small inconvenience to himself. We are not now concerned with other businesses or professions than that of an architect, and, therefore, it is needless to go through the cases which have decided this question in regard to other trades and professions. Of course, a trustee could not perform the contract into which an architect may have entered, but as soon as the remuneration is received then it becomes the property of the creditors. The tendency of the law now is to limit the privileges of a bankrupt as much as possible, and therefore the fruits of personal and daily labour can now seldom escape from the pockets of the creditors, or, more strictly speaking, of the trustee.

SALTBURN-BY-THE-SEA.

One of the best known of the North-Country writers compared the old village of Saltburn to a dove's nest sheltering under the shadow of the ruddy cliffs that rise perpendicularly near it. But this was the ancient village, which had in the distant past a well-deserved reputation for smuggling. That reputation gave place a generation or two ago, as Redcar rose into local prominence as a health resort, to one of another order, for Saltburn became noted for its "fat rascals,"—certain savoury cakes which visitors failed not to appreciate. Slumbering under the shadow of the cliffs the hamlet dwindled, and it is only within the last score of years or so that the situation was appreciated as one of the finest on the north-east coast for a bathing-place. It was one of the directors of the adjacent line of railway who saw the eligibility of the place, and in the course of a few years the crest of the cliff was crowned by a stately hotel, terraces looked from the high ground across the North Sea, a little ravine to the south was turned into pleasure gardens, and rows of modest dwellings sprang rapidly up. Under the impulse of the great trading prosperity that set in in the north-east a decade ago, Saltburn, as the most commanding as well as the youngest of the watering-places of the north, grew rapidly, and bade fair to rival Scarborough. But when the wave of trade depression set in, its reflex action was speedily felt in the health resorts, and it is to that action that Saltburn, owes its unfinished look to-day. Through most of the months of the year it is "remote, unfriended," and "slow," and it is only in the autumn that it wakes up to that semblance of life which society deems good form. In contrast with its busy *bourgeois* neighbour, Redcar, which has a respectable age as a health-resort, and attracts the comfortably-placed shopkeepers for the summer and autumnal outing,—in contrast with Redcar, Saltburn is languid and empty. It does not court the brisk life of the popular health resort, nor the overflowing spirits of the "trippers" who make lively the sands nearer the mouth of the Tees, but to those who appreciate its subdued tone, the pleasures of sea and shore, the scenery of bold bluff and wooded valley, and the deep note of the sea, Saltburn is indeed attractive amongst northern watering-places.

Its site was happily chosen: it is where the sands from the Tees mouth end, ruddy cliffs rising to the south and east, and continuing along a rugged coast broken by little bays and coves at the streams' mouths, to Whitby. Saltburn is placed high, and from it to the north the Durham coast is seen, while far west a veil of smoke defines the course of the Tees. The picturesque coast shows the red face of Huntcliffe Point, that "Huntcliffe Nab" of which Drayton sings as a treasure-house of "stones of a spheric form," which "do headless snakes of stone within their rounds enclose." Between the Point and that part of the town where the Italian front of one of the hotels presents itself, there runs inland from the shore a wide valley, the sloping sides of which are clothed with rich woods, and the grounds of which have been admirably laid out as pleasure-gardens, through which the Skelton "beck" murmurs on its path to the sea. South, the ground slopes upward, and from Boulby, on the coast, to the west of Upleatham, shuts in the moors that intersect the Cleveland district. South and west the great industry of that district shows itself in the puffs of smoke that tell of the mining railways, in the projection of mine-ventilators on the hillsides, and in the rows of mining cottages that here and there dot the green hills and cluster in the valleys of what is a site known in history.

Within a mile or two is that castle of Skelton which was one of the possessions of that great family of Brus that gave kings and queens to Scotland, and dignitaries many to all the three countries. And it has later remembrances, for the predecessor of the present castle was the "Eugenius" of Sterne, and often "Yorick" was the soul of a company "when wit, wine, and mirth" flew round the table. "Crazy Castle" has given place to the structure that now shows its fine western front and embattled cornice to a land that has been changed by the great industry of the North. As near Saltburn, towards the Tees mouth, is the fine old hall at Marske, built by one of the Pennymans in the days of the First James; at Kirkleatham is the ancient hospital founded by Sir William Turner in 1676, with its museum and a grand library; and the quaint old fishing town of Staithes, still proud of its association with Captain Cook. Kilton Castle, "probably built by Robert de Brus," and the old Priory at Guisbrough, are amongst the most magnificent of the ruins the district shows.

Screened from the east winds by the hills in front, swept by the breezes that blow from the Cleveland moors, braced by the strong winds that come in from the German Ocean, life in the summer-time passes pleasantly at Saltburn. It has no business to disturb it,—it is a town for the health-seeker and for the holiday-maker. It is on the shore, the long expanse of sands stretching from it to the Tees mouth; it is on the verge of the moors, and it looks down on the wooded sides of the pleasure-grounds of the glen. Alike from its streets may be seen the fleets of merchant vessels pressing on the ocean to every country, the mining land where the "stones are iron," and the agricultural and antique part of Cleveland, where Freseburgh's conical hill looks on a scene of meadow and moor such as it has known for centuries. It is the appreciation of these advantages that gives to Saltburn the pre-eminence amongst the watering places north of Whitby; its free fresh air, its quiet, and its commanding views. In the future, when from the south it is more easily accessible, these advantages will be more fully appreciated, and Saltburn will attract the many where it has now charms chiefly for the few, who enjoy its quiet and appreciate the rest it gives.

ASSERTED EVIDENCE OF ORGANIC LIFE IN OTHER WORLDS.

A great modern writer, between whose earliest and whose latest works there exists a contrast more painful than any other that can be cited in the records of literature, imagined that he was able to fix the limits of the knowable,—to define what man could, and what he could never, know. Strong in a conceit of which his own works afforded the keenest condemnation, Comte asserted that man could never know anything whatever of the fixed stars, and should therefore confine his studies of the nightly heavens to the movements of the planets. Not many years passed before the folly of the prediction was proved. The spectroscope was added to the implements of science, and before long Huggins was telling us not only of the chemical constituents of the various celestial bodies, and of their solid, liquid, or gaseous conditions, but of the direction, and approximately of the speed, of the motion of some of the stars,—stars so distant from our world that the figures which express that distance in arithmetical form fail to convey any intelligible idea to the mind.

A little time has passed. We have taken breath after the announcements of Mr. Huggins. The latest signals afforded by the study of the spectroscope are those which promise to give some information as to the nature of light itself, as illustrated by the different behaviour of spectra produced by refraction through a prism, and reflection from what is known as a grating, a set of parallel lines ruled on glass at incredibly minute distances from one another. We have scarcely given attention to the hint that the tail of the last comet, B 1881, gives in the spectroscope the lines proper to the vapour of burning alcohol. And now comes another message from the celestial dominions, a message, if it has been rightly read, more wonderful than any that has been signalled by light: a message,—nay more than a message,—a positive relic of life that has been lived outside the boundaries of our own planet. For such, if the facts stated be substantiated, is the result of the microscopic investigation of certain meteorites by Dr. Hahn, of Tübingen.

We speak, of course, with all the reserve that is due to the repetition of so startling an announcement. The first thing to be done, no doubt, is to ascertain beyond all possibility of question that the substances examined are certainly of meteoric, that is to say of non-terrestrial, origin. As to this the statement that the forms detected, though akin to some known to the naturalist, are yet generically different from any hitherto discovered, is not without weight. There are, it is stated, two sorts of meteorites known. Of these, the first, with which we most of us are more or less acquainted, are exclusively composed of iron. Our readers may, many of them, have seen the enormous mass of pure meteoric iron in the British Museum, a bolt which may explain the origin of the famous black stone at Mecca, or of "the image which fell down from Jupiter." The other class of meteorites, which are relatively rare, are silicious, without any trace of iron. Hydrocarbons were detected by Wochler in an aërolite that fell in Hungary. It was thought that they could only have originated in the decomposition of organic substances, but the credence demanded for the idea seemed to be without the bounds of sober speculation. But even more direct evidence is stated to exist by Dr. Hahn. The silicious meteorites are found generally in the shape of spherical or pear-shaped masses, slightly coloured. Dr. Hahn has made sections of these bodies, which he has subjected to microscopic examination. In sections made parallel to the length are some fibres composed of small polyhedra, presenting the form of an irregular polygon with a radiating appearance. These fibres terminate in a point, and sometimes ramify. They comprise a clearly coloured nucleus, enveloped in a darker substance. Dr. Hahn states that they are composed of fossil organisms. He has called in the aid of Dr. Weinland, who has attempted a classification of the forms, which he compares to those found in the *detritus* of coral rocks. He distinguishes about fifty species of polyps and of algæ, imbedded in silex. If it be hereafter established, first, that the bodies examined are unquestionably aërolites, and, secondly, that the chemical and physical signs of organisation are indubitable, we shall have the first direct proof of the theory which has been so fiercely combated by many worthy men, that the organic life existing on our earth forms but a portion of the great system of planetary or sidereal inhabitation.

The most serious difficulty which to our mind is opposed to the views of Dr. Hahn is to be found in the question whence the fossils in question can be supposed to have come. That corals should exist, like, though not identical with, some of the palæontological corals of the planet Earth, or other planets of the system, would be to our mind highly probable. But how should any such relic be removed from its native world? The most violent mode of ejection of any terrestrial mineral into the air with which we are acquainted is that of volcanic scoriæ and ashes. But though dense clouds of these may cover a continent, shutting out, as we have seen, and as Pliny records on the occasion of the destruction of Pompeii, the light of day, nothing rises more than a few miles from the cone. There is no projection of such an order as to send the emitted body beyond the immediate sphere of the attraction of the earth. Neither do we conceive the possibility of such an eruption, or the probability that water rolled on consolidated fossils, showing no signs of volcanic heat, could be found among the scoriæ. Without at all saying that this objection is unanswerable, we still hold that it is one which must be met by the advocates of fossil meteorites. We admit the existence of interplanetary regions in which matter of various kinds may be now revolving as a sort of planetary dust. But we cannot conceive of the growth and existence of fossil life, even of the simplest type, in such a condition. Again algæ are mentioned, organisms of which, as well as of corals, the home is in the water.

We can, indeed, present the advocates of the fossil meteorites with an explanation; but it is one drawn by imagination from the realms of pure speculation, and we are by no means sure that it will be welcomed by the philosophic German mind. It is this. It is well known that in the planetary space which intervenes between Mars and Jupiter, a blank, where a planet ought to be (according to Bode's law) was long thought to exist. It is now known to contain

numerous planetoids, or small revolving bodies, the relation of the orbits of which has led some astronomers to the idea that they are the fragments of a fractured planet. If they be regarded as the unconsolidated elements of a planet which was never coagulated, we get no help from the thought. But if the idea of destructive explosion be admissible, there can be no reason why water-rolled fossils should not be scattered in the catastrophe; or why, after long wandering in the regions of space, they should not at some time stray within the range of the attraction of our globe, and descend on its surface as meteorites. Very wild, the astronomer may say. True; but how else could they come?

FATAL EXPLOSION AT HIGHGATE.

Steam-boiler explosions, preventible evils as they assuredly are, are familiar to us. Gunpowder explosions recur, at the powder-mills, almost with a calculable regularity. Coal-mine explosions, too, often carry devastation through enormous areas of underground activity, and desolation through a county or a province. Water explosions now come to add a new item to the list of terrors,—or rather, as water is neither an explosive substance, nor even an elastic fluid, an explosion the destructive energy to produce which has been accumulated by the silent energy of water.

A reservoir belonging to the New River Company is situated on ground above the Highgate Archway. Its capacity is such as to hold about six million gallons of water, which is pumped up from the great filtering-beds of the company in the neighbourhood of Hornsey. On the closed system of pipes was fixed an air chamber of wrought-iron, about 6 ft. by 10 ft. in height. On the afternoon of the 16th of August this suddenly flew into the air, wrecking a part of the buildings, and killing William Langden, the engineer, who was found in an insensible condition under the *débris*. A disaster of so unusual a kind demands the most anxious inquiry. We do not say this by way of attributing hypothetical blame to any one. The works of the New River Company are under the watchful and competent control of an engineer whom his brethren must approach rather as learners than as critics; and we are confident that the more minutely his arrangements are inquired into, the more thoroughly will this prove to be the case.

But the civil engineer never leaves school. To keep up to the demands of his noble profession he must ever be a learner. He must be a learner from nature, from the counsel and experience of his contemporaries, and, above all, from any new and strange disasters. In the present case we are anxious that the mechanical elements of the case should be exhaustively ascertained. The fractured air-vessel should be subjected to a most careful observation, not only *in situ*, but with the aid of the microscope, and of chemical analysis applied to fragments of the metal; and the maximum force which, whether from gravitation or from direct engine-power, could be exerted at the spot, ought to be distinctly ascertained.

The question presents itself for discussion, how far is it advisable to allow of the introduction of a closed air-chamber in a system of closed water-pipes? We confess that the recent explosion (speaking with due hesitation and reserve) seems to confirm our own opinion that such an element is inadmissible. There are two methods by which water may be made to rise to the top of the buildings of a town. One is by pumping it to the top of a commanding eminence, and allowing it to descend and rise again by gravitation. The other is by direct forcing into a closed system of pipes. We have no hesitation in saying that the first method is by so far the safest, most certain, and most satisfactory, that in any case where the character of the country allows, it ought to be adopted, even if at the expense of much additional main-pipe. But where the closed system is unadvisable, it may be thought that the introduction of air-chambers will not only allow of the disengagement of air forced into the mains together with the water, but further serve, not as a safety-valve, but rather in the way of a fly-wheel, in giving elasticity to the pulsation of the system. As to the first object, we can speak from practical experience of a town where the water, being raised to a commanding level, whence it descends by gravitation, flows into the mains so full of air that it resembles milk rather than water when drawn from a tap. But the milky fluid is of exceptional purity. If left to stand in a glass jug it immediately begins to clear, not, as is the case with muddy water, from the top, but from the bottom. Little bubbles ascend like foam, and in twenty or thirty seconds the water is perfectly clear and pellucid. No doubt the air mechanically mixed with it is an advantage rather than the reverse.

As to the use of air as an elastic cushion, the recent event seems to indicate that it is an unnecessary source of danger. Of course the pressure at any point cannot be increased by the fact that it is transmitted from a non-elastic (practically speaking) to an elastic fluid. But the mode in which that pressure will behave, if anything should give way, is totally different, according as it acts on the one or on the other medium. The rupture of the air-chamber in the recent case proves that a force was applied of sufficient power to rend the metal. If that force had been applied (as in proving tubes) by hydraulic pressure, the iron plate would have torn when its cohesion was overcome, and there would have been an end. But the introduction of the elastic fluid makes this difference; the moment the plate begins to crack or to tear, instead of adequate relief being administered to the tearing power, the elastic force follows up its victory, and, expanding as it overcomes resistance, converts a fracture into a burst, a crack into an explosion. We very much doubt whether any sound reason exists to justify the encounter of such a source of danger. As to this, however, we hope that the disaster of the 16th will elicit an expression of the opinion of the most experienced hydraulic engineers of the day. We commend the subject to the attention of the Institutions of Civil and of Mechanical Engineers.

BUILDING MATERIALS IN THE SIXTEENTH CENTURY.

The amateur theatrical performance recently held, under Royal patronage, in the great hall of Hampton Court Palace, has attracted not a small amount of public attention, and the weekly picture-papers have not disdained to devote their artistic consideration to the conspicuous representation of the scene which the old hall presented on the revival of the memories of its old glories. The Great Hall of Hampton Court Palace, incorrectly termed the "Wolsey Hall," for it was built some years after the famous cardinal had handed over his palace to his master, Henry VIII., holds architecturally an interesting place in the art history of the country. It is familiar, from numerous representations, to many who have never had the good fortune to visit Hampton Court. But a further professional interest is connected with the Great Hall of Wolsey's Palace. We possess detailed accounts of the expenses of its erection, such as are in very few cases to be found. These details relating to the price and quantity of materials used in the erection of the hall are carefully preserved in the Public Record Office; but, practically inaccessible there to the public, they will be found published at length in the excellent "Guide to Hampton Court," written now many years ago,—and, we believe, at present out of print,—the work of "Felix Summerley," now known to the world as Sir Henry Cole, K.C.B., the energetic director in its early struggles of the South Kensington Museum.

We take the opportunity, as an appropriate one, of the public interest recently aroused by the amateur theatrical performance in the Great Hall of Hampton Court Palace, to lay before our readers a portion at least of the curious details in the original account of the building of the hall, "anno 23 Henry VIII." (1532, an interesting year as that following the acknowledgment of the King as "supreme head of the English Church"). Some comparisons by those familiar with the prices of the similar building materials in the present day will be interesting to make, over the 350 years' lapse of time. It may be stated of the comparative value of the sums mentioned, that, taking the standard of the current price of corn then and now, the sums of the time of Henry VIII. would require an equivalent of some eight times their value in the latter quarter of the nineteenth century.

The original Hall of Wolsey's Palace having to be pulled down, the first item on the accounts refer to the sums thus expended:—Freemasons at 3 shillings a week, "every of them working in frestone uppon doors, wyndowes, &c."; carpenters at sixpence a day, "joyners" paid at the same price; in pulling down the hall, every "sawer of tymber" paid at 12 pence the 100 ft.; carpenters for "framyd scaffold," at 6 pence a day; "tylers" taking down tiles, 8, 6, and 5 pence a day; labourers, 4 pence; "setters" "to take down freestone, 3 shillings and 8 pence a week each; and carpenters sorting the timber of the roof, 8, 6, and 4 pence a day. In the building of the new Hall we have the items of the purchase of the implements and materials, mattocks, "scaffold poles"; "10,000 of bryke," paid for at 4 shillings and 6 pence "the thousande"; carters from the brick-kiln at 14 pence a day; "lodes of lyme reddy burnyd," at 10 pence a quarter; chalk at 2 pence a load; "plaister of Paryshe" at 6 shillings "the maunghte"; "Rygate stone," at 4 shillings and 2 pence the ton; "hand ropes to rere the rouff of the New Hall," 29 lb. at 2 pence the lb.; and "six crowys of irone to raise the rouff," at 1½ pence a lb. Bricklayers, "every of them," at 6 pence a day.

The masonry work we find paid for by "the pece," and, of course, the prices vary according to the nature of the work; the same is the case with the carving in stone and wood. In the smiths' work, "barres" standards for windows, for each hundredweight (of 112 lb.), 1½ pence the pound, the price at which all the iron quoted seems paid for. There are some curious items respecting the nails used; 7,350 "dubbyl tenpenny nayles inglys," at 11 shillings the 1,000; 3,800 "myddil bradds" at 12 pence the 100; 2 shillings the 100 for "great bradds; 2,000 "twopenny nayles," at 10 pence the 1,000; 2,000 "syngle tenpenny nayles," at 5 shillings and 8 pence the 1,000; 12,000 sixpenny nails at 2 shillings and 6 pence the 1,000; 5,000 fivepenny nails at 2 shillings and 10 pence the 1,000; 4,000 fourpenny nails at 2 shillings and 4 pence the 1,000; and 1,500 "rought nayles" at 10 pence the 100.

In the item of carpenter's work we find mention of "sesyned playnche," at 3 shillings and 2 pence the 100; 2,000 "fine bourddes," at 31 shillings and 13 pence the 1,000; six "payres of scruse" at 5 shillings and 2 pence "the payre." The plumbers' items quote lead at 4, 7, and 8 shillings the "fother"; "sowther" at 4 pence the pound, "for sorderyng the pypys abowght the kyng's New Palace."

The items for the payment of glazier's work (*anno* 25 and 26 Hen. VIII., 1534-35), speak of "8 panys, new sett, 54 feet, at 5 pence the fote;" the stained and painted glass, with its armorial bearings, is, of course, paid by the piece, but all quotations of plain glass are at 5d. the foot. To pave the hall we see that there were required 6,080 "playne tyles" at 28s. 8d. the 1,000. There is a curious item of "tallow candells" burnt during the night-work, and paid for at 1s. 6d. the dozen; "paving tyles" at 13s. 4d. the 1,000. The contract for paving the hall amounts 53s. 4d.

The painter and gilder's work is paid for by the piece, as might be imagined, and many of the items mentioned,—a detailed description accompanies each,—may be recognised to this day still in their place. We meet here with a general item for four of the "king's words in Gryke letter, with fyne golde gylte," paid for at 2s. the word; a hundredweight of red lead "for the barres of the hal windowes," 13s. 4d.; and a "pottell of paynter's oyle," 1s. 6d. a gallon; 12 pounds of white lead at 2d. per pound; red lead, at 2d. To a painter of posts (white and green) at 1s. 4d. the yard; and again for painting "badges of the king, gilt with gold and bysse," and other colours, 21s. the yard.

We again come upon the item of "fremasons," this time at 12 pence a day; the "warder," 5 shillings a week; "setters," 3 shillings and 6 pence a week; "lodgman," 3 shillings and 4 pence a week; "hard hewers" 3 shillings and 4 pence. Among the carpenters the master is paid 12 pence a day, the "warden" at 8 pence, the rest, as apprentices, 4 pence to 8 pence. Among the bricklayers the master receives 12 pence a day, the "warden" 8 pence, the rest 7, 6, 5, and 4 pence. The master "joyner" receives 10 pence; the rest 7, 6, and 4 pence; the master "paynter," 12 pence; the grinder of colours, 5 pence a day; the master plasterer, 8 pence; the "serviters," 5 pence; the "plummers," 5 pence to 7 pence a day; the "sawyear," 12 pence a day; "scaffolders" at 6 pence a day; the carters at 16, 14, and 12 pence; the labourers at 4 pence.

A number of other items are given, but in no

way connected with the building of the hall. Those who are curious on such matters we again refer to Felix Summerley's "Guide to Hampton Court; its Architecture, Tapestries, Paintings, Gardens, and Grounds."

THE TIMBER TREES OF NORTH SCANDINAVIA.

A LECTURE on "The North Scandinavian Forests and the Wood Trade" was delivered by the Rev. G. Liljeroth, at Albion Hall, Londonwall, on the 16th inst. The lecturer, after some introductory observations, proceeded to define the geographical extent of the forests of Scandinavia, observing that, except a belt along the northern coasts of Norway and Sweden,—*i.e.*, on those parts of the coast between the latitudes of 66° and 72° N., pine-trees grow all over the peninsula. It was his intention, however, to confine his remarks to the North Scandinavian forests, especially those of Sweden. The trees found nearest to the Arctic regions stand alone on the southern slopes of high hills, which protect them against the northern wind. Travelling southward, the explorer would find that as the intensity of the cold diminished the number of trees increased, until at last they formed vast forests. As the whole of Lapland had not yet been fully explored and mapped, it was impossible to state the exact extent of its forests. It might be stated, with tolerable certainty, that the forests of the North of Sweden covered an area of about 17,000,000 Swedish acres, and if the Norwegian forests of Nordland and Finnmark were taken to cover about the same extent,—as was probably the case,—the sum total was an area of 34,000,000 of Swedish acres of forest. This estimate was certainly not excessive, and perhaps it was insufficient. It was not without reason that Swedish iron and Swedish fir had been sought for everywhere. A journey through Scandinavia from the North of Sweden to Denmark would enable the traveller to note the changes in the character and appearance of the trees as he travelled southward. In the most northern parts of the country the trees seemed to have a struggle to eke out an existence; but as the southern part of the country was approached, they became mighty monarchs of the forest. Nothing was more edifying and impressive than a walk through one of the typical forests of North Scandinavia. It was not to be wondered at that the forests had been regarded by the people as holy. The North Scandinavian forests were capable of affording the largest and best supply of timber. The forests in the south were getting used up, and did not seem to have a bright future before them, owing to the wastefulness which was constantly going on. Whole tracts of forests were sold, and the trees cut down, at haphazard almost, and without any settled plan of replenishment. Formerly forest lands were acquired under conditions quite different from those which now obtained. Many people who had amassed such large fortunes as to enable their children to become magnates, had acquired their wealth through having obtained forest property in an improper way. At the present time, however, the timber merchants of Sweden had to buy the forest ground, at great cost, and there was great competition for Crown forests when put up to auction. Cutting-down was going on with undiminished vigour without due provision for the future, and as forests were essential not only to the prosperity, but to the very existence of the inhabitants, the outlook on the future of the country was not a very bright one. The Scandinavian timber-hewer,—the actual worker in the woods,—was necessarily a strong and healthy man. Before he started for the forests he had to prepare and take with him provisions for two months. His bread was made and baked in thin round cakes or sheets as large as carriage-wheels. These were doubled together and put into a sack. The woodman's other food, consisting of herrings, potatoes, butter, cheese, pork, &c., was also put into sacks. The corn-brandy bottle was carried in a more handy and accessible manner, as was considered necessary, owing to the fact that the woodman, in his journey through the forest, made it his duty to have a drink every time he arrived at a suitable tree,—and it was astonishing, said the lecturer, how many "suitable" trees he found on his journey. When a party of hewers arrived at that part of the forest which was to be the scene of their labours, the first thing that they did was to provide themselves with a hut for living in, leaving a hole in the roof for the smoke from the fireplace to pass out. The fireplace consisted of a few stones in the middle of the floor. Round the walls of the interior of the hut, and about level with the fireplace, were fixed broad shelves, so broad as to allow of the inmates sleeping on them with their feet towards the fire, the fire being made so as to burn all night long. Early in the morning, when the men arose from their slumbers, kettles containing potatoes were placed round the fire, and frying-pans containing meat or fish upon it. Knives and forks were not used. Every man helped himself with his fingers, which were already covered with resin, soot, and other matter,—dirt of some standing. After the men had made themselves sufficiently comfortable by means of warmth and food, out they went into the intense cold to their work,—a work attended with many dangers, for often a falling tree would get entangled in the branches of another tree, and the work of disengaging it required a great amount of intrepidity, quickness, and daring. The pay of the timber-hewer was very small. Although he worked from early in morning until late at night, he seldom earned more than 1½ or 2 Swedish crowns a day. The removal of the fallen trees from the forest was usually accomplished, in the first place, by horses. Beautiful as those animals were when they went into the forest in the autumn, in the spring they emerged in a most dilapidated condition. When the roads were bad the poor animals suffered fearfully, and they were often beaten shamefully. At times they had literally to wade in snow, and at other times they had to drag their sledges over sand and stones. In going over large stones they had a jumping style of motion, in order to get free of the trees they were drawing. When the trees arrived at the watercourses they were floated down. The work of a floater was both amusing and dangerous. Very often a single log would place itself across the stream, and so prevent the passage of thousands of logs. The mass of logs accumulated through this obstruction could only be liberated by cutting away the obstructive log. No one was compelled to perform this dangerous work, but somebody sufficiently daring generally volunteered to cut away the log. The logs behind, in consequence of the rapidity of their descent down the streams and over the waterfalls, mounted one upon another, until there was an enormous mass of timber waiting to be set free from the obstruction. When a few cuts of the axe had been made at the obstructive log, it crashed through by the force behind it, and then woe be to the wielder of the axe unless he was as fleet of foot as a cat. The work of removing the fallen trees from the forests often rendered it necessary for the men to sleep out in the open, in the midst of snow and ice, all night. That would not be possible but for the fact that they were able to build a fire of logs which would not only burn all night, but far into the next day. The men lay with their feet towards the fire. The work of floating was in some respects very detrimental to the population, for, for the sake of earning extra wages, many engaged in it who, owing to the shortness of the spring, could ill be spared from the work on the farms. The worst of it was that many of the men were not only none the richer for their extra earnings, but eventually a great deal the poorer, for they spent their extra earnings in drink, and led such a riotous life that they unfitted themselves for steady application to work in the future, and they returned to find their homes neglected and their characters blasted. The saw-mills, which were now mostly worked by steam-power, were for the most part situated on the mouths of the rivers on the most suitable parts of the coast. The saw-mill owners were, as a rule, a well-to-do body of men, living in houses having ten or eleven rooms, whereas very often the workman had only one room for himself and the whole of his family, which room had to serve at once as kitchen and bedroom. The relations subsisting between the mill-owners and the workmen were not of the best. When the men complained of smallness of wages, and sought for more, they were taunted with such extravagances as wearing overcoats and goloshes, and carrying umbrellas, to say nothing of drinking Champagne, going to "Temperance and religious meetings," and otherwise "throwing away" their money. The men, on the other hand, when the mill-owners informed them that badness of trade compelled them to reduce their wages, retorted on the masters by saying that hard as they alleged the times to be, they did not live less luxuriously or eat less expensive dinners than in more prosperous times. Thus there was continual recrimination between masters and men, and this was the cause of the Sundsvall strike a few years ago, which had been productive of a great deal of damage to the trade of the North,—and unfortunately the repressive measures of a military character which were taken had made matters worse. The king recognised that, and, over-ruling the local authority, ordered the withdrawal of the troops. Unfortunately, the strike in question had left many evils in its train, and one of them was the tendency towards Socialism and irreligion which was found amongst some of the working people. Although vast areas of forest had been cut down, and much of it burnt or wastefully destroyed, a very great deal remained,—some of it almost impassable owing to its density. But the requirements for home consumption and export were very great. For home consumption, over 96,000 standards of timber were used every year for making corn-brandy alone, independently of other home needs, while 718,000 standards were exported. Even with this large consumption and export, however, the forests of Scandinavia would be equal to the demand upon them, provided that they were properly conserved and protected. At present a great deal of damage was done by wounding and stripping the trees for the sake of getting tar. This was carried on with great and reckless waste, and the trees, being allowed to stand in their mutilated condition, prematurely withered away and died. It was hardly possible to imagine the melancholy appearance which some parts of the forest presented owing to this mutilation of the trees. If a suitable machine could be devised for economically and expeditiously removing the stumps of the trees which had been cut down, this mutilation would very soon cease, as the stumps, which really contain the material most serviceable in making tar, would be profitably utilised instead of being, as hitherto, wasted. In the northern parts of the country a great deal of damage was done to the trees by taking off the bark for food for goats. The best and most sappy trees of the forest suffered from this cause. Millions of trees of the finest promise had been destroyed owing to these injuries. Forest fires, which were of frequent occurrence, also wrought terrible havoc. Some of these fires were, it was to be feared, the result of malicious acts, but the majority of them were the result of accident or carelessness on the part of the woodmen. When a fire broke out in the forest everybody in the vicinity was bound to help to stay the disaster. This was commonly done by clearing a space round the area of the fire by cutting down the trees, a process which had to be repeated over and over again when strong winds were blowing. A tract of burnt-up forest presented a fearful sight. Happily, the nation was awaking to the importance of conserving its forests, and schools of forestry were everywhere springing up, and increasing the number of their pupils. An organised system of inspection had been established. Every year plenty of forest seed was sown. In one recent year Sweden had 1,375 planting schools, which were the means of planting 3,589 lb. of seed. This year 4,462,668 plants had been planted. In this way the nation was doing a great deal to keep the forests alive, although rather late in the day. It should be remembered that it was a long time before the best trees came to maturity. Some of them needed to grow for 250 years before they were fit for felling and sawing. It would thus be a long time before the forests now being recuperated would be ready for the axe of the hewer. In conclusion, the lecturer referred to the honourable dealing which he said was characteristic of the English wood-merchants, and expressed the hope that the pleasant relations which now subsisted between them and the Swedish merchants would remain unimpaired, to the advantage of the trade of both England and Scandinavia.

Mr. Liljeroth, whose interesting lecture, delivered in the Scandinavian tongue, was interpreted to the meeting, was accorded a vote of thanks.

Surbiton Cottage Hospital.—The first premium for plans for a cottage hospital at Surbiton was awarded by the committee to Mr. Ernest Carritt, 4, Lime-street-square, London; and the second premium of 10*l.* to Mr. Loxwood King, of Surbiton.

DAMP: ITS CAUSES, EFFECTS, PREVENTION, AND CURE.

Under this title M. G. Philippe, a civil engineer officially employed by the municipality of Rouen, has contributed to *Les Travaux Publics* a series of valuable and interesting papers, of which we reproduce the principal points. The subject is of universal and individual interest, and of even greater importance in the climate of England than in that of France.

The *causes* of damp in buildings are,—1, the presence of water in the atmosphere and the soil; 2, the porosity of building materials, which absorb it.

Its *effects* are only too well known, and may be classified as,—1, disintegration of masonry, with injury to wall-papers and other similarly-placed decorations; 2, decay of timber, and injury to wooden furniture; 3, development of saltpetre on walls, with injury to wall-decorations; 4, injury to health of inhabitants.

The decay of the timber used in building often carries with it an especial danger in France, because there chesnut-wood is frequently employed for large beams; and as this wood decays first at the heart, while the outside remains sound, no superficial examination will give warning when an important piece of timber may be about to give way.

The development of saltpetre results from drying after damp. It is well known that this substance can be obtained from old building materials, and the white patches which it forms upon perfectly sound walls are familiar. During the siege of Paris, in 1870, the possibility of utilising it for military purposes was taken into consideration, and a committee was appointed to investigate the amount obtainable in this way in case of necessity. It reported that the production of saltpetre in a building was in direct proportion to its age and uncleanliness. This conclusion appears very obvious, when we remember that saltpetre consists of potash, combined with nitric acid, and that nitric acid is azotate of ammonia. Kuhlmann, a distinguished chemist, proved by experiment that ammonia contained in a porous body is oxidised by contact with the air, and becomes azotate of ammonia. Fermenting vegetable and animal matter everywhere furnishes ammonia, building materials are the porous body required, and all clays contain potash; so that all the component parts of saltpetre are ready to hand, and as soon as the moisture which has held it in solution is evaporated by drier air, the salt appears upon the surface. It is not necessary that ammonia should be present in any offensive form; rain will contain it, and fogs (especially town fogs) carry it in comparatively large quantities.

The prevention and cure of damp may be attempted by:—(1.) employment of suitable materials for cellars, and other parts of buildings below or on the level of the soil; (2.) damp-courses to stop the upward progress of damp; (3.) preparations of different natures, either to protect the face of an exposed wall from the weather, or to prevent damp in the wall from affecting an apartment; (4.) precautions against infiltration.

The most thoroughly sanitary foundation for a building is concrete; and the author recommends covering the whole level of the future building with a layer 4 in. thick, composed of two-thirds broken flints well washed, and one-third mortar made of lime and gravel sand. He estimates that such a layer would cost about 2½d. per square foot.

Well-puddled clay forms a good and inexpensive foundation, in districts where it is easily obtained. A layer 8 in. thick should be spread over the site of the building, and extend for about 16 in. outside the walls; and the external 16 in. should be carried up with the wall until the level of the soil is reached. Clay cannot, however, be used to form a dry flooring for old buildings, as can be done with concrete.

Various methods have been proposed and employed for destroying that porosity of building materials, which is one of the chief causes of the mischief. M. Sébille, a civil engineer in Paris, has patented a process for injecting materials (especially brick) with gas refuse, which penetrates their substance, and renders them impermeable by water, at the same time increasing their weight, and giving them a brown colour. A wall built with bricks thus prepared is absolutely dry, and their price is only increased by about 3s. 4d. per 1,000. Good results have been obtained by immersing the materials in solutions of soap and alum successively, and by applying these two preparations to the thoroughly-scraped surfaces of the walls of buildings already standing. The result of the chemical reaction which follows is to fill the pores of the brick or stone with a fatty substance, which opposes the passage of water. The immersion costs about 1d. per cubic foot of material.

The method preferred by M. Philippe is to plunge the material with the hand into a solution of silicate of potash for a time, merely long enough to allow all the air-bubbles to disengage themselves from its surface, and then to lay it aside for forty-eight hours before using. The additional expense is extremely small, and the results (according to his experience) very satisfactory.

Many varieties of cement and other material are employed for mixing with mortar, in order to render it impermeable by water; of these the principal are Vassy or Gariel cement, Vicat (from Grenoble), Portland, French Portland, and Peterspense cements, ground brick, Pozzolana (volcanic), wood ashes, calcined oyster-shells, &c. The greatest additional expense from using any of these is from 3d. to 7d. per cubic foot of masonry. A layer of such cement 1 in. thick, lining the walls of cellars, &c., is very useful, and costs on an average a little over 3d. per square foot. M. Philippe does not recommend French Portland cement, which is prepared chiefly at Boulogne, and which is much used in the North of France, as it very imperfectly excludes damp, and is easily penetrated by saltpetre. Of French cements he prefers the most expensive,—that of Vassy. For application to damp walls, solutions of soap and alum, used one after the other, have already been mentioned. Another substance which has proved useful for the purpose is gas tar. The wall must be well scraped, heated in parts by means of a hand-stove, and the tar applied with a brush as hot as possible. It then penetrates into the pores, and hardens in cooling, forming a crust which arrests the passage of damp and saltpetre. The cost is very trifling.

An important and interesting piece of work of this kind was performed about the year 1813, under the direction of MM. Darcet and Thénard; and as their methods have not been surpassed, we quote a portion of their own account, extracted by M. Philippe from vol. 32 of the "Annales de Chimie et de Physique":—

In that year, "M. Gros undertook to paint the upper cupola of the Church of Sainte Geneviève. The surface had been prepared like a canvas, with a layer of strong size, covered with white-lead mixed in drying oil. M. Gros consulted us upon the durability of this composition, and we did not hesitate to declare that it was far from offering the desired security against damp. After consideration and experiment, we adopted the following method. All the previously-applied preparation was entirely removed; portions of the interior of the cupola were then successively and highly heated by means of a large gilder's stove, and our preparation applied with large pincers, at a temperature of about 212° Fahr. To facilitate its absorption, the wall was re-heated once or twice during the process. Successive coatings were applied until no more could be absorbed. When dry, a coating of white lead mixed in oil was superposed, upon which the painting was to be executed. The preparation used consisted of one part of wax and three parts of boiled oil, with one-tenth its weight of litharge. The heat employed must merely stop short of carbonising the oil."

The same process was applied by its inventors to two damp underground rooms at the Sorbonne. The mixture was slightly different, consisting of one part oil prepared with litharge, and two parts resin melted in the oil,—an operation of some delicacy. The plaster was allowed to remain on the walls, and they were thoroughly dried with a gilder's furnace, which, by an ingenious arrangement, was made to move along the wall at a fixed distance from it, and at any height. When dry, they were again heated for the application of the varnish, as in the preceding case. Five coatings were absorbed; the sixth was partially absorbed, and formed a smooth hard surface to the wall. The cost of the process is chiefly that of the labour; the value of the materials being about 1d. per square yard.

M. Philippe proceeds to make suggestions and give opinions on various points of detail, some of which we reproduce.

Parquets may be preserved by laying them upon bitumen. This invention was patented by M. Gourguechon, but his patent has expired. It has been successfully varied by laying down a well-smoothed bed of cement, then applying a thin layer of asphalte to a portion at a time, and laying down the parquet before the asphalte had cooled. The only difficulty with these methods is that they cannot be used with pieces of parquet much exceeding one yard in length. The frames by which the parquet is held should be fastened to rows of spaced bricks, and the intervals filled up with pebbles, cinders, or other dry and healthy material, avoiding sawdust, old plaster, and similar matters.

Ventilating Bricks on the Flagedé system may be made on the spot in a mill supplied by the inventor, at the rate of from 300 to 400 per day, of almost any materials that may be at hand,—plaster, conglomerate, brick-earth, even of *torchis* (clay mixed with straw and grass). They admit air to the interior of the walls, and thus keep them dry. Their size is double that of bricks, and their price comes to about 1l. per 1,000.

The *Journet patent* for dry floors or areas consists in laying down a bed of cement about 2 in. thick, in which small pipes are laid at about 1 in. apart, and then covered with another 2-in. layer. When the cement begins to harden, the pipes are drawn out by the end, leaving hollow tubes, through which the air can circulate, if proper openings are provided in the walls.

Silicate applied to the surface of buildings renders them almost impervious to the action of weather. It has been applied by M. Kuhlmann to the principal monuments in the town of Lille, and to the new buildings of the Louvre in Paris, with the additional good result of harmonising their tone with that of the older portions. It costs about 10d. per square yard, for three successive applications at twenty-four hours' interval. M. Mignot has invented a cheaper preparation, coloured to suit the different kinds of stone. It is to be noted that silicates cannot be used upon walls where saltpetre has been or is likely to be developed.

Enduits have been invented in great variety by different makers. A very excellent one, called Glyko-metallic liquid, is prepared by MM. Caron et Dupuis. It prevents all action of damp on cement and plaster, by neutralising the alkaline salts which they contain, and can be painted on with perfect security. Old walls should be well cleaned before it is applied; new ones will require three coats, which will cost about 9d. per square yard. An excellent preparation of gutta-percha is supplied by the Maison Gaudri, in Paris, for the same purpose, and costs about the same price.

Windows are one of the principal avenues of damp into apartments. One cause of this is the bad quality of the stone often employed. It should be as hard as can be obtained; or it might be covered with zinc, or coated with a good cement. Small leaden gutters may be placed inside the windows, to catch and carry off the rain which penetrates. This plan is particularly recommended for the windows of kitchens and bath-rooms, where the steam condenses on the glass in considerable quantity.

For *slates*, M. Philippe recommends either the Fourgeau or Chevreau system of hooks in preference to the ordinary method of nailing,—which makes a hole through which damp penetrates.

Drains from closets should be furnished with a ventilating-pipe, carried up with the chimneys, or which may (as at the Hôpital St. Louis and the old Hôtel Dieu at Paris) open direct into the kitchen flue, thus being always secure of a strong upward draught. In this way all unpleasant smells are obviated.

Mr. Gladstone's Chair.—The chair presented by the Greenwich Liberal Association to the Right Hon. W. E. Gladstone, M.P., on the 17th inst., was manufactured by Messrs. G. S. Lucraft & Son, of the City-road. It is made of brown oak, the covering being in buff morocco, finished round the edge with Westminster blue banding and silver nails. In the centre of the back, embossed in gold, are the arms of Mr. and Mrs. Gladstone. The carving on the top of the chair, in the form of a wreath, includes the rose, shamrock, and thistle, and leeks, in the centre of which is the silver inscription-plate. In the panels on each side is an axe. The panel under is emblematical of Despotism on the one side, and of Liberty on the other, with the All-Seeing Eye in the centre. The chair runs on silver castors, and there is a footstool made to match. In design it is a good square sound chair, and creditable to all concerned.

SANITARY EXHIBITION AT EASTBOURNE.

An exhibition, principally of sanitary appliances, but also including objects of art and articles of domestic utility, was opened on Monday last in the Devonshire Park Pavilion, Eastbourne. The exhibition, which originated from a suggestion of the Surveyors to the Local Board (Messrs. C. Tomes & E. W. C. F. Schmidt, A.R.I.B.A.) and Mr. J. T. Rodda, has for several weeks past been looked forward to with a considerable amount of interest. The public men of the town heartily co-operated with the three gentlemen named; his Grace the Duke of Devonshire consented to become patron of the exhibition; and Dr. G. A. Jefferys (chairman of the Local Board) accepted the post of President. The promoters of the exhibition state that it is a well-known fact that Eastbourne is the one town in England where all sanitary matters are attended to perfectly, and having proved the benefits of proper sanitation themselves, they are desirous of sharing them with their visitors and giving them an opportunity of seeing and hearing for themselves what sanitary science can do. With this end in view they have, besides providing the exhibition, arranged for a course of popular scientific lectures, two of which were given on Monday, the others being given on subsequent days of the exhibition. The lecturers on Monday were Mrs. F. Johnstone and Dr. Alfred Carpenter; on Tuesday evening Professor Robert Kerr delivered a lecture; on Wednesday there were two lectures, one at four and one at eight,—the evening lecture, by Mr. E. C. Robins, F.S.A., F.R.I.B.A., being on "The Revelations of Sanitary Science," and the afternoon lecture being by Mr. A. M. Mowbray, F.R.I.B.A., whose subject was "How home can be made attractive and healthy."

At the opening ceremony the President (Dr. Jefferys) officiated, and in the course of his address said that amongst all the objects which he saw around him it would be very difficult to descant upon one particular exhibit; but having seen the programme, he was greatly struck with the title of a lecture to be delivered on Friday by Mr. Schmidt. The title was a very extraordinary one, "How not to build a House." He hoped he should not be encroaching upon Mr. Schmidt's domain if he said a few words on the way in which he (the speaker) considered a house should be built. A house, he took it, should be a building in which a person or human creature might dwell, and unless such a house possessed certain essentials, it would be a dangerous place to dwell in. In his opinion the essentials necessary were, that it should have a good situation, be well-built, be situate in a broad street, have rooms well aired and well ventilated, and be bountifully supplied with pure water,—be replete, in fact, with every sanitary appliance; and, above all things, well and efficiently drained. A town was a crowd of houses, and if each house possessed all the essentials he had mentioned, that town would be a healthy place, and would afford pleasure to those who took up their abode in it. They rejoiced to have a town possessing many, if not all, the essentials he had mentioned in his ideal house. Eastbourne was well placed, and sheltered from the prevailing winds by the glorious Downs. The houses were well built and situate in broad streets, beautifully planted with trees growing luxuriously, which made the town picturesque and beautiful. Apart from this, they were open to the great expanse of sea, which tempered their climate, and the breezes from which not only produced salubrity in the town, but imparted to it a bracing atmosphere. Amongst their 25,000 inhabitants, he trusted there were many who would come and see for themselves the exhibition which those present saw around them, and he was sure they would go back with new ideas, the carrying out of which would benefit their neighbours and the town in which they lived. He would ask, also, that employers of labour should send their artisans to the exhibition, feeling sure that the employers would benefit from the knowledge acquired by their men; he would ask parents to bring their grown-up children; and he would ask masters and mistresses to allow their domestic servants to attend, believing that they would derive such knowledge as would tend to make home comforts more pleasurable. Finally, he would ask all those who could to come, being sure that the end they had in view was to increase the pleasure, promote the health, and prolong the lives, not only of Eastbourne people, but of visitors who frequented that health resort of theirs. In conclusion, he declared the first exhibition of sanitary appliances ever held at Eastbourne duly opened.

The opening ceremony thus ended, visitors commenced a tour of the exhibition. The stands in the pavilion, thirty-nine in number, are arranged around and in the centre of the room. The first stand is occupied by Messrs. Doulton & Co., Lambeth, who show many specimens of art pottery, but whose speciality is their new Silicon ware, for which they claim that it is free from the objections belonging to the high glaze of ordinary pottery, and the porosity and fragility of terra-cotta. Mr. D. T. Bostel, of Brighton, exhibits his Brighton "Excelsior" closet, and other articles. The stand of another local exhibitor, Mr. J. A. Skinner, of Eastbourne, covers a considerable space; he has on view several specimens of closets, cisterns, and ventilators, as well as traps and smoke-preventing chimney-pots. A stand of a similar character, the proprietor of which is Mr. F. G. Underhay, of Farringdon-road, London, adjoins Mr. Skinner's stand; and next to this Messrs. Doulton & Co. have a second stand, at which they exhibit water-waste preventers, bath apparatus, filters, and other sanitary appliances, in action. Messrs. Fredk. Walton & Co., Berners-street, London, exhibit specimens of the Sunbury non-poisonous wall-decoration, in a variety of good patterns. Samples of concrete chimney-pieces, paving and moulding slabs, may be seen at the adjoining stall, occupied by Mr. W. H. Lascelles, of Bunhill-row, London; the Silicate Paint Company have the next stand; and following this is a stand occupied by Messrs. S. & E. Ransome, Strand, London, who show their patent solutions for the cure of damp walls and for preserving stone from decay, and specimens of tile and stone work dressed with these solutions. Concrete tubing for drainage purposes, improved gullies and stoneware pipes, with the Stanford joint, from the Bourne Valley Pottery, Poole, comprise the exhibits at the adjoining stand; and at the next Messrs. Wilcock & Co., of Barmantofts, Leeds, have a fine show of glazed bricks in every variety of colour, architectural faïence, red and buff terra-cotta work in many designs, among them models in foliage and fruit, and sanitary specialities in the shape of patent gullies, flushing tanks and traps, irrigation conduits, sewer ventilators, &c. Another of Doulton & Co.'s stands, at which are to be seen terra-cotta mantelpieces with patent fire apparatus, terra-cotta fenders, hearth tiles, drain-pipes with patent joints, intercepting traps, latrines and urinals, and many other things of a like nature, follows; and at the succeeding stand, occupied by J. C. Ellison, of Leeds, are that gentleman's patent ventilating appliances. The Papyrotile Company, with specimens of a newly-patented and effective wall-tile for decorative purposes, come next; then another stand of ventilating sewer and gully traps, closet pans, &c.; and next Messrs. Robert Boyle & Son's, of London and Glasgow, at whose stand the well-known Boyle's patent self-acting air-pump ventilators are on view. Besides all these there are in the room a stall at which Banner's patent ventilators are shown; another at which can be seen working models in glass of Shone's patent pneumatic ejector as now being applied in the sewerage of Eastbourne; and Mr. C. E. Zimdars's stand of pneumatic bells, indicators, pulls and pushes, and pneumatic door-catches. The pavilion itself contains all the stalls enumerated, and the annexe an equally large number. In fact, the annexe is even more interesting than the exhibition in the Pavilion itself, for in this department almost everything is at work, and practical illustrations are thus given of the utility of the various exhibits. Closets and lavatories of every description, filters and stoves, pottery, cooking ranges, patent window sashes and fastenings, ventilators, gas-burners, lamps, butter-making implements, are among some of the contents of the stands here. Certificates of merit are to be granted to the most meritorious of the exhibits.

Volunteer Sanitary Work.

The audience at the afternoon lecture on Monday, delivered by Mrs. Johnstone (Manager of the Hastings and St. Leonards Sanitary Aid Association), was not a very numerous one. The Rev. H. Cooper occupied the chair, and introduced the lecturer, who proceeded to read a lecture on "Volunteer Sanitary Work—Auxiliary and Subordinate to that of Medical Officers of Health," prefacing her remarks with the observation that as the system she was about to advocate had been carried on successfully in the borough of Hastings for more than ten years, and as the distance between Eastbourne and Hastings was small, those present might easily investigate and judge for themselves whether or not such work might be organised beneficially throughout the kingdom. Mrs. Johnstone then went on to say that notwithstanding all the attention bestowed by medical officers of health on the prevention of scarlet fever, that fever continued to spread and increase from year to year. If, therefore, it could be shown that in any place this fever had been so controlled during ten consecutive years as that in no instance during that period had a serious or general epidemic occurred, then public attention might well be bestowed on the means taken to procure that result. In order to stop the spread of the disease, it was plainly necessary, first, that the system of disinfection practised should be complete in its results; and secondly, that this system should actually be applied. The lecturer then proceeded to relate the manner in which the association at Hastings carried out its work. The association, she said, was maintained purely by voluntary subscriptions. The parochial clergy having poor in their charge were nearly all on the committee, and all on the subscription list, and these, with their district visitors and the teachers of schools, formed the agency for information. By these, information as to the first outbreak of disease was brought to the notice of the association, and the association's visitor, who was the only salaried officer, and who was in receipt of 40*l.* a year, then visited the sick-house, instructing the parents or those in charge how best to treat the sick patient and prevent infection. The association was always more or less supplied with disinfectants by the public bodies of the town, and had always worked in union with the medical officer of health and the medical men in the town. She strongly urged that the subject of treating sick people should take a place in the compulsory code of education for women, and in conclusion advised that public bodies should take into their employ a woman teacher, to perform similar duties to those undertaken by the visitor of the Hastings Association, as well as a sanitary inspector.

The lecturer at the conclusion was loudly applauded, and on the motion of Professor Robert Kerr, seconded by Mr. Councillor Hamilton (Brighton), a vote of thanks was accorded to her.

The Duration of Life.—Why is it Shortened?

The above was the subject of the lecture delivered on Monday evening, to a crowded audience, by Dr. Alfred Carpenter. The chair, in the absence of Dr. Jefferys, was occupied by Mr. G. A. Wallis. Dr. Carpenter, in commencing his lecture, said he thought it spoke well for Eastbourne that they should dare to hold such an exhibition as had been opened that day. At any rate, it showed the honesty of purpose that guided the men of Eastbourne so far as sanitary matters were concerned. They had every reason to be satisfied with their sanitary condition, because if they could show a death-rate of only thirteen in the thousand they had a pre-eminence which was held by no other town in the kingdom. People, however, died at Eastbourne as at any other place, and among them young children. We were told in Holy Writ that the days of men were threescore years and ten, and in bygone days men lived to a great age. Now, however, the average life of persons was forty-one years, and he contended that it was in consequence of our disobeying the laws of nature that life was so short in this age. There was no reason why we should become the subjects of disease except for one fact, namely, that we do that which we ought not to do. No one ought to die of disease, and he fully believed that a time would come when none would die except from old age, which was the natural form of death. Pure water and good sanitary arrangements, he was convinced, would do this in the end, and no one could deny that the operation of local authorities was capable of reducing the death-rate. To prove this, he quoted statistics of certain towns to show that since proper control had been exercised by public bodies appointed under the Public Health Act, the death-rate had greatly decreased. Continuing, he said we were told "That the sins of the father shall be visited upon his children to the third and fourth generation," and stated that he fully be-

lieved that hereditary diseases would not extend beyond the third or fourth generation if the laws of Nature were only properly attended to. If this were attended to he was certain that hereditary diseases would be got rid of. Turning to zymotic diseases, he showed that these were brought about by uncleanliness and by reason of the pores of the skin being stopped up and the excreta kept in the body instead of being thrown off. As evidencing the good effect of properly carrying out sanitary laws, he alluded to the low death-rate in prisons and barracks, which, a few years ago, were the most unhealthy dwellings in the country, but which now were filled with the latest sanitary appliances. Turning to the effects of alcohol, he said the deaths produced by alcohol in this country were something enormous. It was not drunkenness that caused the deaths, because hundreds of thousands of people were killed by alcohol who had never been drunk in their lives. The consumption of alcohol hardened certain carbon matters in the blood, and prevented the proper escape of carbonic acid gas from the body, and he had no hesitation in saying that life was shortened by the consumption of alcohol. He spoke of the necessity of phosphates in food, and said he was glad to see that a call was now being made for bread from which the phosphate and fibrine had not been taken by the miller. After a passing allusion to the danger of defective drainage, a subject, which would be dealt with more fully by subsequent lecturers, the speaker said that the day was close at hand when persons letting houses with foul drains, from which injury resulted to those who lived in them would be punished. In conclusion, he said he was certain that the people of Eastbourne were determined that no seat of disease should find an entry into their town, and thanked the audience for the patient manner in which they had listened to his lecture.

THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT MALVERN.

The thirty-eighth annual congress of this Association was opened on Monday last in the hall of the College at Great Malvern.

Lieut.-General Sir John Hawkins, R.E., in the name of the town of Malvern, and as chairman of the Local Board, bade the Association welcome, and the Vicar, the Rev. Prebendary Gregory Smith, as chairman of the Local Committee, added a few well-chosen words.

The President of the Association, the Very Rev. Lord Alwyne Compton, Dean of Worcester, having expressed his thanks on behalf of the British Archæological Association, then proceeded with his address. He observed that the last occasion of the kind at which he had taken the chair was at Northampton, as president of the sister Society, the Archæological Institute, and on that occasion he chose as the subject of his address "The Defence of Restoration." He went on to say that, much as they must sympathise with the anti-restoration movement, there was not a little to be said on the other side. They were so accustomed to the well-ordered beauty of their churches now, that they forgot the terrible disappointments of their earlier days. They had in Worcestershire side by side a restored and an unrestored church,—at Pershore. One, indeed, was a splendid example of Gothic, the other a very poor one, and so, it might be said, the comparison was hardly fair. But still he would ask any of the younger members of the Association, who could not date back their antiquarian pursuits to the earlier half of the present century, when they visited Pershore, after inspecting the abbey church, to go also into the other parish church close to it, and to believe that many a parish church which they now viewed with artistic pleasure, if not with antiquarian interest, was but little better, say in 1840, than that which seemed now so strange. They could not forget that these churches were buildings intended for a most important and sacred use, and to sacrifice the very purpose of their erection in an attempt to preserve their ancient features would be something like the action condemned by the ancient poet of those who, for the sake of life, would lose all that made life valuable. If churches were now less interesting as monuments, they were much more beautiful, more suited to the purposes of devotion as churches. Not that there was any reason why both objects should not be attained to. It was usually from ignorance or carelessness,—it might be of the architect, it might be of the builder, or of the restoration committee,—that the old and interesting features had disappeared when the work of restoration had been carried out. If care was taken to preserve, as far as possible, all old work, restoring when necessary, and not otherwise, just so much as needed it and no more, and not attempting, by over-careful matching of stone, and other like tricks, to deceive the future student,—however much the ignorant sightseer might be taken in,—he believed that the antiquary and the devout Christian might be equally well satisfied. This course, he added, might be advantageously followed in cases other than those of churches. Referring to the well-known Queen Eleanor Cross at Northampton, which had been restored three times, as an illustration of his view, the very rev. president went on to refer to Worcester Cathedral, which he considered one of the finest examples of restoration to be met with: had he said of over-restoration he should perhaps have been misunderstood. He could not agree with those who would probably condemn everything that had been done. He thought the interior one of the finest that he was acquainted with,—the very finest, considering its size,—it must be far finer now than it was before the work was begun. The outside, no doubt, looked terribly new, but in an archæological point of view, what had been lost? The whole of the outside stone had largely perished in the beginning of the eighteenth century, from the ravages of the weather upon its surface. Mouldings and other delicate features could scarce be traced. Then came the hand,—not of the restorer, but of the men who wished to make it neat, and new, and tidy. They pared down the mouldering lines, and reduced each string-course to what they looked upon as a more perfect condition; they put on the top of pinnacle neat spire, formed like that of the neighbouring church of St. Andrew; they repaired the tracery of the east window according to their notions of what we should now call Late Gothic. Was all this worth keeping? Was it not far better that the east window, of which they saw so much from the interior, the pinnacle outside, the deep mouldings, and string-courses, should be renewed to something like their original Early English character, even if this involved some newness of appearance for a few years? The walls were dangerous,—unsightly modern buttresses supported them; nothing short of rebuilding would suffice. The internal stonework was replaced, stone by stone, as far as possible. He thought that, so far, the restoration of Worcester Cathedral was wisely and well carried out; but, in some respects, he thought it went too far. The large severe lancet windows had in some cases been subdivided by a mullion, and their heads filled by tracery of a later period of Gothic art. These features were removed at the restoration, and he regretted it, as they were part of the history of the building in the period of our greatest architects, and also because it seemed to him they had lost some beauty by the change. The Gulston Hall they must all regret; but they could not fairly blame the Dean and Chapter, who offered to find 5,000*l.*, one-half of the estimated expenses needed for the Gulston Hall, if those who desired its preservation would raise the rest; but they received only one promise of 5*l.* towards it. After some further remarks on the restoration of Worcester Cathedral, the president went on to ask if we, in our day, had any architecture at all. If what we built now lasted 500 years, would there be anything in it to tell in what century it was built? He had already said that the want of originality in these days might be partly the effect, perhaps also partly the cause, of our treatment of ancient buildings. Careful and minute study of old work seemed likely at least to check any freshness of artistic thought. It was quite true that in the period of the Renaissance the artists and architects did most carefully study and copy the work of the Romans as they found them in ruined amphitheatres and temples, and also in the domestic decorations of Herculaneum and Pompeii. But they were using them for new purposes. The palaces and churches of modern Italy were necessarily quite different from the houses and temples of the Romans, and thus what were then new elements of beauty were worked into architectural designs of which the essential constructional features, the plans, the elevations, the window spaces, the roof were already in full use, and from this combination of the old and the new a very beautiful style was soon produced, but the extraordinarily rapid deterioration of this style seemed to show that from the very first it was not based on sound principles. The copying of the ancient forms and ancient decorations seemed to have had not immediately but ultimately the effect of destroying style altogether, and now we have again taken to this copying, and he feared the result would be even worse than before. He feared they could not boast of a Victorian age of English architecture. As to any remedy, he feared there was none. In concluding his address, the President apologised for dwelling so much on the subject of modern architecture. If they were asked what was the use of the study of archæology, he answered that it was the handmaid of history; that it helped to fill up the outlines given us by the chroniclers of old times; and that by its means they might eventually hope to solve the great question of the unity or the non-unity of the human race,—of the original condition of man in respect of what, for shortness, we expressed by the words civilisation and morality.

Thanks having been voted by acclamation to the President, at the instance of the vicar, Mr. Wright, F.S.A., as congress secretary, gave an outline of the daily proceedings of the congress, and the party, under the guidance of Mr. Nevinson and Mr. Tyrrell, the hon. local secretaries, proceeded to the Priory Church, where Mr. W. Jeffrey Hopkins, F.R.I.B.A., and Mr. E. P. Loftus Brock, F.S.A., gave some account of its history and architectural features.

Mr. Hopkins said the priory was founded at the end of the eleventh century,—Leland said in 1085,—but prior to the Conquest a congregation of hermits resided here, and in ascending the hill joining the present priory is a place called the Hermitage. Aldwyne, the first prior of Malvern, was contemporary with St. Wulstan (founder of Worcester Cathedral) and the priory continued in a flourishing condition until the dissolution of the monasteries by Henry VIII. Mr. Hopkins proceeded to give reasons for his belief, judging from the remains of the old priory which had been excavated, that the church originally had an apse, and speculated as to the cause of the adoption of the double apsidal arrangement, which he thought might be attributed to a difference in the ritual of Continental and English churches. He considered that the double apse originated at Tours. The remains of the lady-chapel, he said, were all of too late a character to have belonged to Aldwyne's time, but they found them on the site where one should have stood. These remains convince him that the chapel formerly standing at the east end was either an aspidal or a circular chapel. Having glanced at what the presbytery of the original Norman church probably was like, Mr. Hopkins proceeded to describe the other portions of the building, taking for his guide such remains of the original building as still remained above or underneath the ground. As to the interior of the nave, instead of the walls presenting their present bare and cold appearance, the original would certainly have been covered with frescoes or distemper paintings. These were even introduced into our smaller parish churches of that date. The church, according to Mr. Hopkins's view, founded on the "faithful stones" that remained, answered in every particular to the description of a Benedictine church. Between the time of the erection of the Norman church and the partial rebuilding that took place in the fifteenth century, Mr. Hopkins said there must have been erected in connection with the church a very beautiful structure of the Decorated period, to which was to be attributed the admirable examples of detail which they saw built into the east end wall, which were dug up during the excavations made by the Rev. Mr. Dyson on the site where the lady-chapel stood. In some of the bosses which formed part of the roof of this chapel were still to be seen traces of gilding. Of the conventual buildings, with the exception of the fifteenth-century abbey gateway, he feared not a vestige remained except a few details of the old refectory. They knew, however, that the cloisters were on the south side, as at Worcester. Turning attention next to the Perpendicular work, he thought there could be no doubt that it belonged to the same date as the fifteenth-century work of Abbot Seabrook, of Gloucester, commenced in 1450. Prior John of Malvern commenced his about the same time. The manner in which the Perpendicular clearstory had been added to the old Norman work was

not satisfactory, and did not harmonise at all with it. Referring afterwards to the old painted glass in the windows, he considered there was none existing to excel it. Let them compare those windows with the dead, dull, heavy productions of modern times. Nevertheless, they had been shamefully treated, and their fragments jumbled together, owing to which many interesting subjects could not be made out. If he were asked what should be done with this old glass, his reply would be, "Simply nothing." He thought, however, that many of the subjects might be recovered and brought together. He would have correct tracings made of the windows, or drawings of full size, and then, following the lines of the leading, would have the drawings cut up into pieces, as one would for a child's dissecting map, and then using the pieces in the same manner, they might bring once more into juxtaposition the dispersed pieces, and recover many of the lost subjects. Referring to the more modern history of the building, Mr. Hopkins said that at the Reformation this monastery was doomed, like the others, to destruction, which the earnest pleadings of Latimer himself were unable to avert. He petitioned that it might, with a few others, be saved, and used for educational purposes, but in vain. The history of the church, from the Dissolution down to living memory, had been little else than the recital of acts of desecration, wanton folly, ignorance, and neglect. It had been restored in modern times and at different dates to its present state.

Afterwards a large number of members and visitors dined together at the Imperial Hotel, Lord Alwyne Compton in the chair.

We shall return to the proceedings of the Congress next week.

PROPOSED VESTRY HALL, ST. GEORGE'S, HANOVER SQUARE.

At a meeting of the St. George's Vestry, on the 18th inst., Mr. Finch moved that the Vestry invite the competition of twelve architects to submit plans of a Classical character, for the construction of vestry-hall and offices in Mount-street, and that three premiums be offered of 100*l.*, 50*l.*, and 25*l.* respectively, for the first, second, and third best plans. That the Vestry appoint a committee, to be called the building committee, to prepare a plan of the exact site for new buildings, and the necessary conditions upon which the competition is to be invited. The extreme limit of the cost of the building, exclusive of the fittings, to be 12,000*l.* The price for the land (3*l.* per superficial foot) had been agreed to. He thought 12,000*l.* would be a sufficient sum for the building. Mr. Dowdeswell seconded. Finally the Vestry decided to adjourn the question till the first meeting in November.

THE "AUBEL" PRINTING PROCESS.

The "Aubel" system of reproducing architectural and other drawings has been the subject of some interesting remarks in one of the German technical journals. The process differs from photo-lithography and other systems of a similar character, inasmuch as neither asphalte nor gelatine is used in the plates. The secret of the invention consists in the composition of the photographic plate, from which an impression is obtained either on a lithographic stone (whence the printing is done as usual), or on bright-polished zinc plates. The latter are, by an etching process, made to serve for the printing-press in such a manner as to replace the ordinary wood-block. An unlimited number of copies of equal distinctness can thus be produced. The "Aubel" system surpasses ordinary photographic productions as to the size of the impression. A plan of Cologne is said to have been executed by this process, of the dimensions of 39 in. by 52 in., the whole printed in one piece.

RESTORATION OF THE CASTLE AT HEIDELBERG.

The attention of the Grand Ducal Court of Baden has lately been directed to the question of restoring the above noble ruins. A consultation of architects of note will, it is said, be shortly held to consider what steps should be taken. The subject has for some time been before the profession in Germany, and has attracted the attention of some of its most eminent members.

PRINCIPAL PORTAL OF THE EX-CONVENT OF SAN PABLO, VALLADOLID.

If we except Henry VII.'s Chapel at Westminster, and Roslin Chapel, Scotland, we have no examples of the elaborate surface richness displayed in some other countries in the buildings erected just before the Renaissance. Spain, as we have before had occasion to show, in the series of illustrations by which we are seeking to make better known to untravelled English readers than has hitherto been the case the architectural glories of that remarkable country, has many specimens of this extravagant style of ornamentation, belonging chiefly to the reign of Ferdinand and Isabella, A.D. 1474–1516, though some are earlier. We add to the instances of lavish exuberance we have already illustrated, a view of the principal entrance to the Ex-Convent of San Pablo, in Valladolid, completed in 1463, every inch of which is elaborately and beautifully carved, displaying groups of figures, pinnacles, foliage, and diapers in wild but not inharmonious profusion.

German influence is strikingly obvious in the design, and it has been attributed to a German architect. Mr. G. E. Street ("Some Account of Gothic Architecture in Spain") thinks it may possibly be the work of the artists Gil de Siloe or Diego de la Cruz, who wrought under Juan de Colonia and his son at the monuments and Retablo in the Convent at Miraflores.

DERWENT HALL, DERBYSHIRE.

Derwent Hall is a somewhat extensive shooting-box of the Duke of Norfolk, E.M., situate about thirteen miles from Sheffield, in the fertile valley of Derwent Dale, and surrounded by the Derbyshire moors. Originally the property of the Balguys, it passed into the hands of the Newdigates, from whom it was purchased by the present noble proprietor, who decided to pull down the later additions, which were of a farm-house character, and to increase the buildings in style with the genuine old work. The present buildings include the entrance-hall, with the duke's study on the left, all beyond this being domestic quarters, and on the right, beginning at the front, the duchess's boudoir, the library, dining-room, and drawing-room, of which we have already given an internal view, the sacristies, and the domestic chapel, a simple but massive building in the Early English style. The domestic quarters contain kitchen, scullery, housekeeper's room, still-room, butler's pantry, servants' hall, pantry, larder, dairy, game larder, gamekeepers' rooms, &c. On the two upper floors are thirty rooms for bed and dressing, &c. The stables contain fifteen loose boxes and stalls, a treble coach-house, 28 ft. by 18 ft., two harness-rooms, stablemen's mess-room, and three bed-rooms. The stables are fitted up by the St. Pancras Iron Co. in a simple but substantial manner, the woodwork for stalls and loose boxes being of teak, and the walls lined with the Farnley Co.'s buff and brown glazed bricks. All the sitting and bed rooms are lined with panelled wainscot oak, principally carried out by Messrs. Dealy & Horner, of Sheffield, but the drawing room and dining-room, which are carved, are by Messrs. Farmer & Brindley. The doors are furnished with simple iron handles, finger-plates, and hinges, treated by Professor Barff's process, and harmonise well with the solid-looking oak. These fittings, together with the stained glass of the chapel, were supplied by Messrs. Hardman & Co., of Birmingham. Dog-grates are used throughout the house, the fire-places being lined with tiles of different designs.

The walls are composed of the local hard stone, which is speedily assuming the grey tints of the old work, and thereby will soon render the building all in unison. The roofs are covered with the old-fashioned grey slates, and this further helps to carry out the Duke's wish to keep up the character of the works throughout.

The whole of the works have been carried out under the supervision of the architects, Messrs. Joseph A. Hansom & Son (now represented by Mr. Joseph Stanislaus Hansom, F.R.I.B.A.), of 27, Alfred-place West, South Kensington; Mr. James Firth is the clerk of works. The Hall is situated so far from most of the depôts of material that the later works have had to be carried out without a contract. Messrs. Robert Dennett & Co. were, however, the contractors for the chapel and part of the house. Later the labour has been obtained by the clerk of works, and goods have been supplied by separate tradesmen, amongst whom in addition to those already referred to, we may mention Mr. Corrie, of Sheffield, plumber; Messrs. Edmundson, of Westminster, electric bells; Messrs. S. C. & J. L. Ellis, of Sheffield, hot water apparatus; Mr. Chadwick, of Sheffield, plasterer; Messrs. Minton & Hollins, tiles; Messrs. Stuart & Smith, dog-grates and tiles; Messrs. Longden, of Sheffield, kitchen fittings; Messrs. Chew & Sons, of Stroud, iron casements.

NEW BOARD SCHOOLS, ROCHDALE.

The Rochdale School Board, in January last advertised for competition drawings for the erection of new schools to accommodate 500 children, and the appeal was responded to by about thirty-eight architects. The committee, after consideration, selected the design with the motto "Utility," by Messrs. Mangnall & Littlewoods, architects, Manchester, who were instructed to procure estimates and carry the work out. The contract has been let to Messrs. Peters & Sons, builders, Rochdale, and the amount will be under 5,000*l.*, including fittings and architects' commission. We give view and plan.

The mixed school for boys and girls is situated at the south end of the site in Derby-street, and is 60 ft. in length by 20 ft. in width, and 20 ft. in height, and accommodates 120 scholars, allowing 10 ft. of floor space for each scholar. Directly communicating with the school-room are four class-rooms, two of which will accommodate fifty-five, and the other two thirty-five scholars each, allowing 10 ft. of floor space for each scholar.

Hat and cloak rooms and lavatories are provided for each sex in immediate connexion with the entrances.

The infants' school is situated at the north end of the site in Derby-street, the principal approach being from this end. The school is 48 ft. in length, by 20 ft. in width, and 20 ft. in height, accommodating 120 children allowing 8 ft. of floor space for each. Two class-rooms each accommodating forty children, communicate directly with the school-room. A white glazed brick dado, 4 ft. high, will go round each school-room and class-room, which will have a pale green tinted band of another colour at the top and bottom. The ceilings to each school will be splayed on each side. The roof principals being exposed to view, are in pitch-pine, varnished.

The boys' and girls' latrines are situated adjoining to the west boundary wall, and will be on the dry-earth closet system, properly ventilated. The infants' latrines are situated near to the back school-entrance, and are approached by a covered passage.

The schools and class-rooms are to be heated by hot-water pipes.

A louvred ventilating-shaft is fixed on the roof over each school, and communicates with openings in the ceiling regulated by doors which open and close with pulley and cord. Fresh air is introduced every few feet along the walls of each school, at a height of about 7 ft. above the floor, by means of Sherringham's ventilators, and foul air is to be let out at the ceiling level through Boyle's tale ventilators.

The windows are also adapted for the free admission of fresh air by the simple plan of hanging the top part to fall inwardly (regulated by cord and pulley), and the lower parts, being sashes, afford means of cleaning.

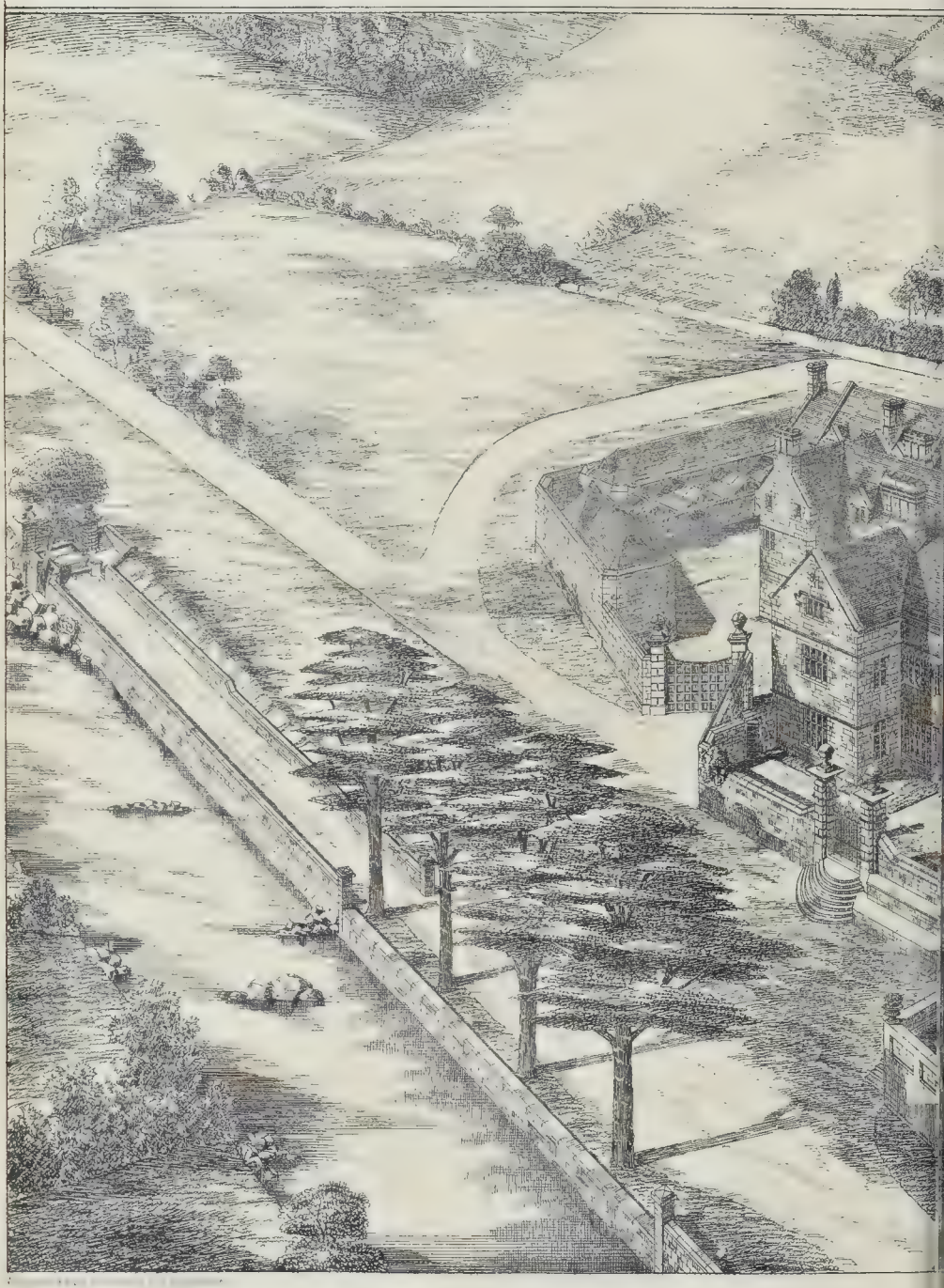
The elevations are faced with stock bricks, with masonry sparingly introduced where most required to throw off the water, namely, to stringcourses and sills and the upper part of cornices; the rest of the ornamental work will be executed in red terra-cotta.

The roofs will be covered with green Welsh slates fixed to yellow pine sawn battens. The ridges are of red Staffordshire crested tiles.

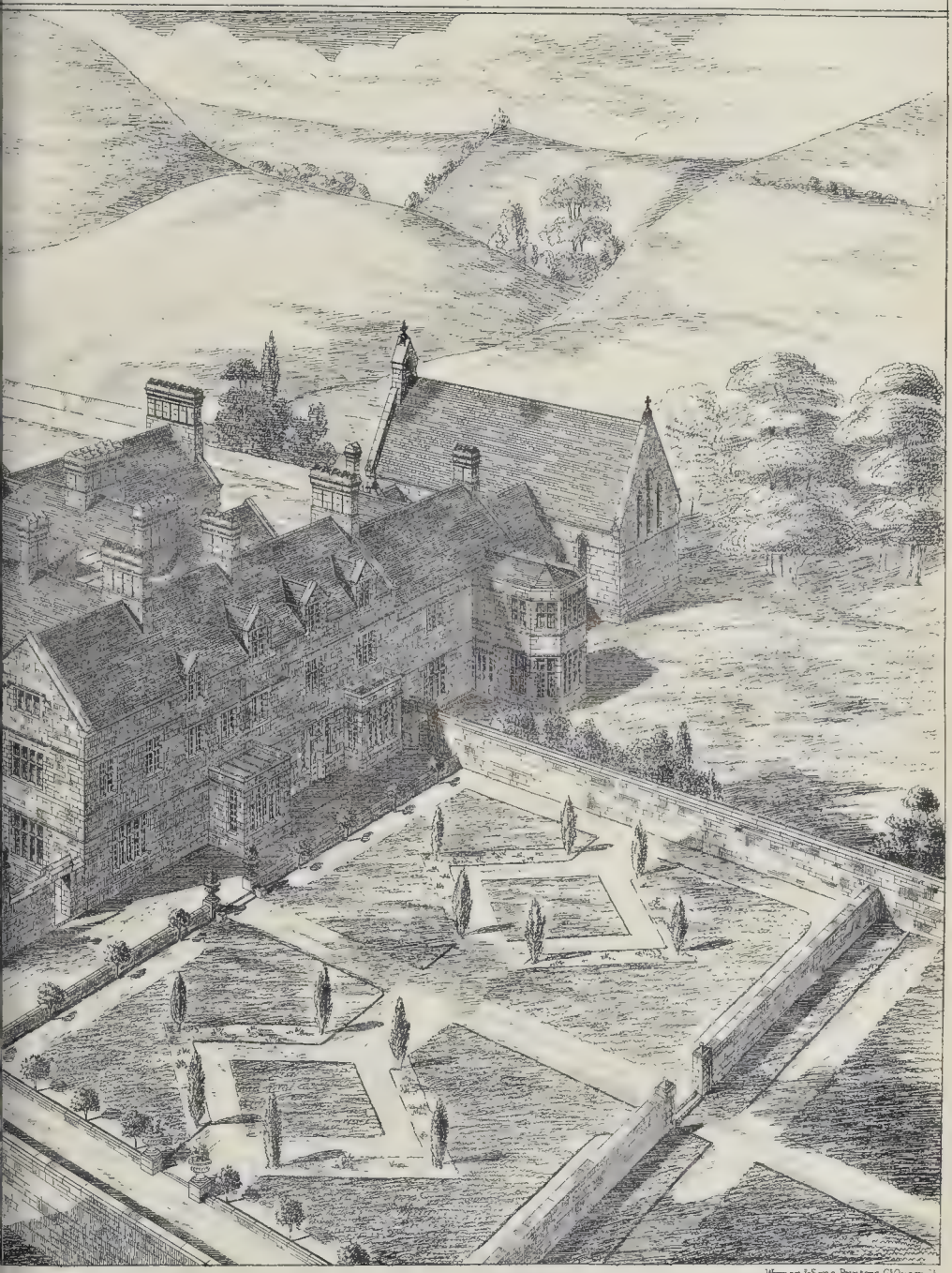
The internal joiner's work, such as doors, &c., is to be of pitch pine, varnished.

Mr. John Churchill, who, in company with a companion, had been accidentally drowned a few days previously at Sidmouth, Devon, was buried there on the 17th inst. Several hundreds of his fellow-workmen and friends followed him to the grave. Mr. Churchill was only twenty-eight years of age at the time of the lamentable occurrence. He was out-door foreman to Mr. Harry Hems, of Exeter, having succeeded, in that position, the late Mr. Stephen Shute, whose death was referred to in the *Builder* for September 18, 1880.

DERWENT HALL. *Derbyshire as restored and enlar*



or. His Grace the Duke of NORFOLK. E.M. J.A. Hansom & Son. Archts



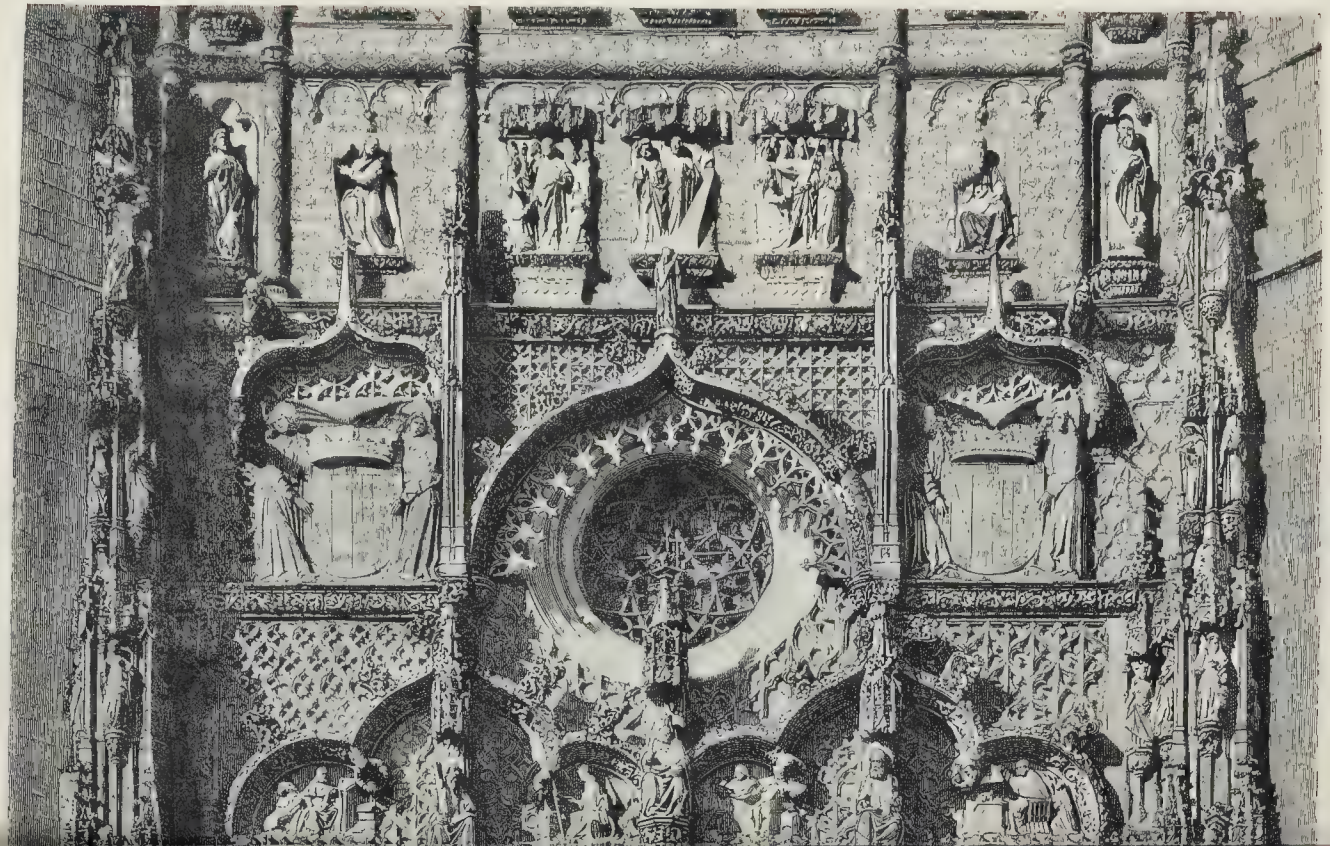
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Whiteman & Bass *Photo Litho* 236, High Holborn

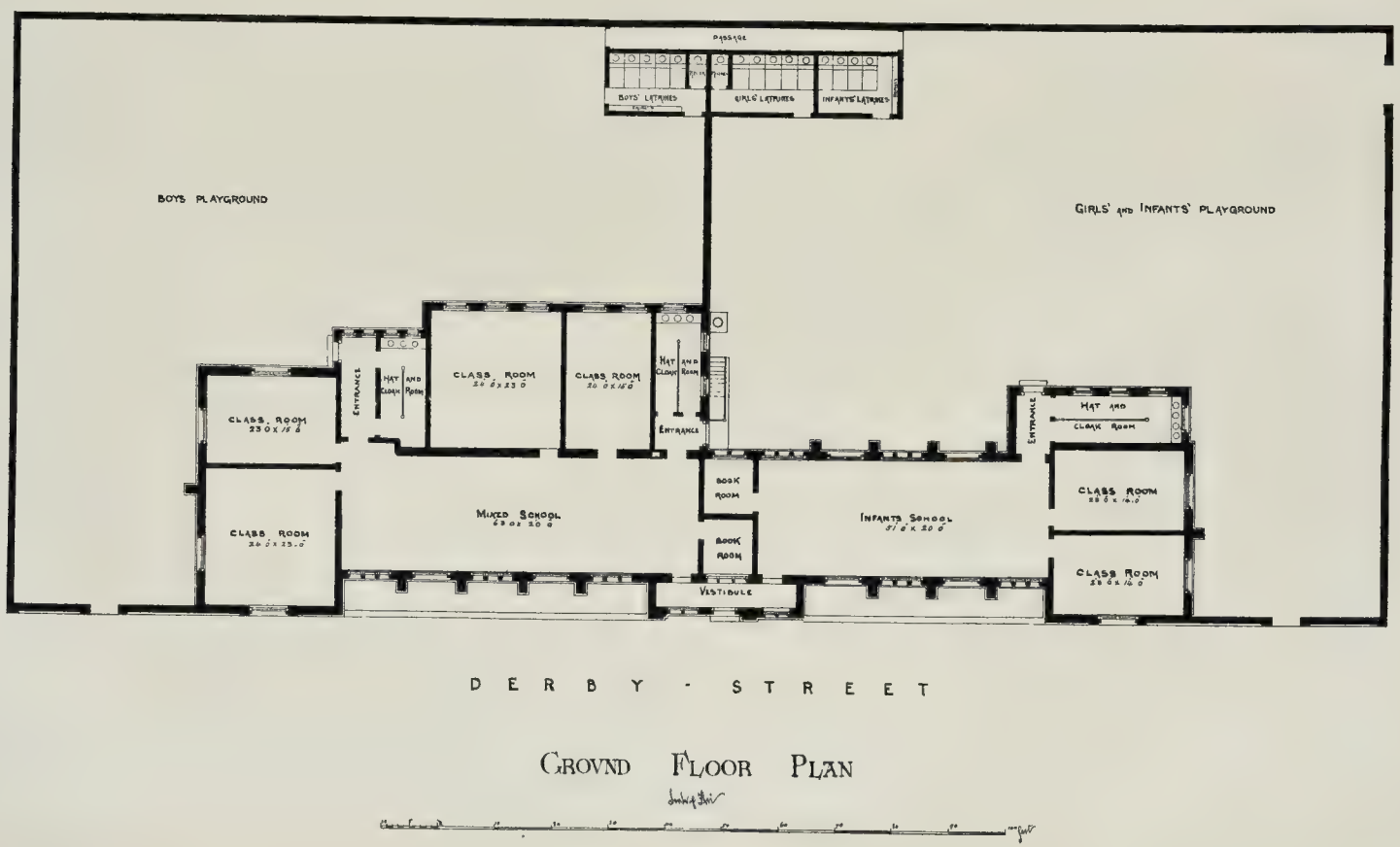
NEW BOARD SCHOOLS, ROCHDALE.—MESSRS. MANGNALL & LITTLEWOODS, ARCHITECTS.

Wyman & Sons Printers, 74 Queen St





THE EX-CONVENT OF SAN PABLO, VALLADOLID, SPAIN: PRINCIPAL PORTAL.



GROUND FLOOR PLAN

Scale of Feet

Whiteman & Bass, *Photo-Litho* 236, High Holborn.

NEW BOARD SCHOOLS, ROCHDALE.

Wyman & Sons, Printers, 74-76, Great Queen St.

EDUCATION AND EYE-SIGHT.

The reports of the third examination in technical education, held by the City and Guilds of London Institute, show a considerable increase in the number of students. In 1879 the number was 202; in 1880, 816; in 1881, 1563. The successful candidates were respectively 151, 515, and 895; and the localities or centres of examination were 23, 85, 115. The towns furnishing the greatest number of successful candidates were Bolton, Manchester, Newcastle-on-Tyne, Huddersfield, Oldham, Crewe, and Gateshead.

Of the 1563 candidates for a pass in the present year, only 213 took up more than a single subject of them, 126 were examined in mechanical engineering and some one other subject; 43 in flax and cloth manufacture, and 16 in fuel and iron and steel. The subjects named show the thoroughly useful objects of the Institute. About 770*l.* will be distributed this year to teachers, and 240*l.* in money prizes, besides thirty-eight silver and forty bronze medals. Among the subjects in which examination will be held in 1882 are breadmaking, distilling, linen-bleaching, linen manufacture, jute manufacture, electric lighting, electrical instrument making, metal plate work, and weaving and pattern designing. Flax will not be treated as a separate subject. It is, however, one on which in the present year the answers of the candidates have been pronounced by the examiners to be generally unsatisfactory. A winter-class of lectures, including laboratory and workshop instruction, will be given at the temporary classroom of the Institute, in Cowper-street, Finsbury. They will include the subjects of fuel and illuminating agents, distilling, metals and metallic compounds, electric lighting, transmission of power, electrical instrument making, and electrical laboratory apparatus. There will also be evening trade classes in bricklaying, metal platework, masonry, carpentry and joinery, sanitary engineering, house decoration, and modelling. In contrasting this broad scheme of useful education with the merely literary standards of the Board schools, it may be well to call the attention of the examiners to the eyesight of the pupils. How far this may be affected by the evening classes is a question of no slight importance to the future welfare of the students. The inquiry is suggested to us by the fact that the very journals which announce the programme of the City and Guilds of London Institute happen to contain an extract from a German paper showing the immense deterioration of the eyesight of the children in Germany, which is attributed in great measure to the small crabbed print of the school books, printed in the German character. Myopia prevails among these unfortunately over-educated little mortals, in exact proportion to the advance of their studies. Over an average of 10,000 children, from five to 11 per cent. in the elementary classes proved to be shortsighted. In the next grade of schools for girls the proportion rose to from 10 to 24 per cent. In the *Realschulen* it is from 20 to 40 per cent.; in the Gymnasia from 30 to 55; and in the two highest classes of all, between 35 and 88 per cent. Out of 600 students of theology at Tübingen 79 per cent. suffer from myopia. The question may occur how far an excessive use of tobacco has produced a hereditary weakness of vision, but the real practical value of that learning which is acquired at the cost of eyesight is to our view extremely problematical.

THE MOSAICS IN THE CATHEDRAL AT AIX-LA-CHAPELLE.

Early last month the mosaic decorations in the cupola at Aix-la-Chapelle were completed. The subject represented is that of the "Court of Heaven" as described in the Book of Revelation, with the twenty-four elders offering homage. The work partakes somewhat of the nature of a restoration, for it is on record that such mosaics once existed and were destroyed.

As soon as the work was decided on, Baron Bethune, of Ghent (according to the details before us), undertook to furnish the designs, in which it was intended to follow as closely as possible the outlines given by historians of the original mosaics. The changes made are only in points of detail, such as the omission of the seats of the elders,—which, as their owners were represented standing, must in their emptiness have produced an ungraceful and monotonous effect in the original work. The execution of the designs was entrusted to Dr. Salviati, of Venice, about whom our readers have often heard.

Professional and general opinions seem agreed as to the success of this work, in which simplicity of design united with brilliancy of colour produces a striking effect. From the octangular construction of the dome, and the fact of the light being thrown upwards from the eight windows, the effect is heightened in a singularly effective manner. The comparative rapidity with which the work has been executed speaks well for the suitability of Salviati's process for modern requirements; and when we consider that the space covered is 3,000 square feet, the time occupied seems relatively short. The whole has been done within two years, we note, although the time allowed by contract was three years. This rapidity is only attainable by the conjunction of material, financial, and technical facilities of the highest grade. In the different processes of manufacture there are, it is said, the most recent improvements; but the chief advantage of the system is in a process described at some length in the notice before us.

The ancient method of fixing mosaic work was to cover the wall under treatment with a coating of cement, and insert the pieces separately. This system (still in operation at Rome) only allows two or three workmen to be engaged at any one time, if due regard be given to regularity of effect. The Salviati process consists in the distribution of various parts of the design amongst different workmen at the factory. Each part of the design is pasted on paper, the reverse of the blocks being outwards, and thus when being placed in position it is only necessary to bring the separate sheets and fix them into the cement. The removal of the paper from the face of the blocks is, we presume, easily accomplished. Apart from the advantage of rapid execution, it is remarked that the uniformity and regularity of surface (so necessary in mosaic work) are much more easily attained by this method than when each block has to be fixed separately. Of course, the saving of labour allows of a proportionate reduction in the cost of the new system as compared with that of the old.

There remains, however, the question of durability to be glanced at, and under this head, we notice that although some of Salviati's mosaics have been twenty years in position, they are as firm as when first executed, although in some cases exposed to unfavourable climatic and atmospheric influences. The testimony of the late Sir Gilbert Scott is cited in the remarks before us in support of this assertion, with respect to work executed under his direction, such as the Wolsey Chapel at Windsor, the Albert Memorial, &c.

It is suggested that the remaining portions of the octagon should be decorated in a similar manner. Its present undecorated state is to be changed, and the effect produced by the mosaics overhead leaves no option to the chapter but to make the rest of the Emperor Karl's chapel in harmony with the dome. According to the *Echo der Gegenwart*, "Germany has been enriched by a noble work which meets not only the religious but also the artistic requirements of such a task. Aix-la-Chapelle thus offers a new inducement to art-loving strangers to pay the city a visit."

NEW BRIDGE AT SAGAN.

The relative advantages of wooden and stone bridges as to cost of erection and of maintenance form the subject of a statement in a foreign contemporary. The town of Sagan, in Silesia, is now erecting, at a cost of about 10,000*l.*, a sandstone bridge with five arches of sixteen yards and a half each in span, the roadway being nine yards and a half across. The life of a massive bridge is estimated at 300 years, and the cost of maintenance is reckoned at a quarter per cent. per annum, the renewal of pavement forming the bulk of this charge.

The wooden bridge now being replaced was erected in 1849 at a cost of 2,000*l.*; repairs during the thirty years have cost 2,500*l.* From experience it has been found that about thirty years is the average duration of a wooden bridge; hence in a century, the process of building would have to be repeated twice more. The total expense would have to be counted as nearly 15,000*l.*

SUSSEX ARCHÆOLOGICAL SOCIETY.

This Society had its excursion the other day to Ashburnham, and the proceedings of the day were very successful, although the weather was not altogether propitious. The gathering-place was at Pevensey, whither the members with their friends flocked from all parts. A large number assembled, to be further reinforced at Ashburnham, where about 350 persons mustered in front of the church. The arrangements for the excursion had been made by a sub-committee consisting of the honorary secretaries, Rev. W. Powell, of Newick, and Mr. F. Barchard, of Horsted Place, and Mr. Robert Crosskey, Mr. J. C. Lucas, and Mr. Griffith. The train reached Pevensey at about eleven o'clock. The visitors repaired first to Westham Church, in the vicinity of the station,—a plain but rather interesting old church,—over which the party were conducted by the vicar, who proved a most amiable *cicerone*. The church, which is a large stone structure, built partly in the Decorated style, dates back to the year 1539. It consists of a chancel, nave, and two chapels, that on the south being dedicated to St. Katherine. From Westham the party proceeded to the fine ruins of Pevensey Castle, which is one of the most perfect of castellated remains of Roman origin. The outer walls of the castle inclose an area of about eight acres, and are almost 20 ft. in height. In the interior is a smaller fortification of a quadrangular form, with round towers, and which was once entered by a drawbridge. The circumference of the outer walls is about 260 rods, and they must at one time have been of immense strength. A few of the party, who had made good use of their time, went on to Pevensey Church, a fine and interesting structure of considerably greater age than Westham, and which was much admired. According to the programme, the Rev. Mr. Powell was to have read a paper on this church, but, as is too frequently the case on such occasions, the programme had to be curtailed for want of time. The party then took to the carriages, and soon left the quaint old town behind them, crossing that flat marsh country,—there pronounced "the Mash,"—towards Ashburnham. After about half an hour's drive, revealing some interesting sights in the distance, such as Hurstmonceux Castle, one of the oldest brick buildings in the county, the seemingly small, but scattered, village of Wartling was reached, and a halt was made to inspect the little church, which lies far away from the main portion of the village, in one corner of the parish, somethiog like five miles from the opposite end. The Rev. Dr. May, acting as *locum tenens* for the Vicar, was awaiting the arrival of the party to explain the principal features of the church. A well-preserved Catherine-wheel window, and a Pelham buckle of more than the ordinary size in the outer wall, are worthy of notice here. The wooden spire is rather a rarity in Sussex. The ride from Wartling to Ashburnham, leading through pleasant lanes and fine woodland scenery, was very enjoyable. There was Hurstmonceux Castle to be seen, and Windmill Hill, the seat of Mr. Curteis, and as the ridge of high land was crossed the openings in the green woods and plantations revealed some charming views. The Vicar (the Rev. Rose Fuller Whistler) was waiting outside the church at Ashburnham, and proceeded at once to show the visitors first round and then over the church, explaining its various features of interest. The church was rebuilt in 1663; and one of its features is that in all the windows the mullions are of oak instead of stone. The Vicar read a paper on the church, in the course of which he said: With the exception of the tower, the whole of the parish church of Ashburnham was rebuilt in 1663 by that well-known cavalier John Ashburnham. The church consists of a tower, a nave, and a chancel with two side chapels to its north and south. The nave is entered from the tower by seven steps, and from it there is a similar approach to the chancel. The effect of this arrangement is extremely striking, the sacrarium (altar) standing out in grand relief as you approach it from the west end of the building. A somewhat steep fall in the ground from east to west has thus been happily utilised, and if the construction is not unique, it has at least given an unusual character of grace and boldness to the building, with an effect of light and shade not often to be found when side aisles are wanting. This effect, however, is generally missed, as the entrance is usually made by the porch on the

COST OF SOME GASHOLDER TANKS.

The following particulars, showing dimensions and cost of a certain number of gasholder tanks, may be found useful. Fuller details of one of the tanks would be valuable. Messrs. Aird & Co. were the contractors:—

London Gasworks, Nine Elms.—Diameter of concrete tank, 200 ft.; depth, 45 ft.; cost, 17,600*l.*

Phœnix Gasworks, London. — Diameter of brick tank, 218 ft.; depth, 44 ft. 6 in.; cost, 21,446*l.*

Gas Light and Coke Company, London.—Brick tanks—diameter of brick tank, 195 ft.; depth, 37 ft. 6 in.; cost, 15,000*l.* There are six similar tanks. Cost of same, 90,000*l.*

Leicester Gas Tank.—Two of brick, each 172 ft. diameter, and 37 ft. deep. Cost of each, 15,200*l.*, or 30,400*l.* the two.

Birmingham.—Brick tank, diameter, 185 ft.; depth, 41 ft.; cost, 18,190*l.*

FROM ABROAD.

The exports of window-glass from Belgium during the first four months of this year were 29,884,003 kilos., against 31,961,587 kilos. in the corresponding period of last year. Business with England, the United States, and China, shows a decrease, as well as the exports to Hamburg and the north of Europe generally. On the other hand, an increase is reported in the trade with Holland, Russia, Spain, Italy, Turkey, Roumania, Chili, and Peru.

A curious fact is noticed in the German press, which is not without interest to the building industry. At a small village on the Baltic, noted for its quietness, Prince Frederick Charles has had three block-houses erected for himself and his attendants. They are constructed of whitewood, the furniture being of the same material, and were made in Sweden. The ease with which the different parts are arranged to be joined makes this sort of house, it is remarked, particularly serviceable for temporary habitations on the seashore, or in mountain districts.

An institution for the higher technical education of those engaged in textile industry was recently founded at Crefeld. The erection of a suitable building has just been commenced, and will occupy two years. The city has given a site, and contributed 7,500*l.* towards the cost of erection. The plans are by the municipal architect, Herr Burkard, to whom the direction of the works has been entrusted, under the official supervision of the Government authorities at Düsseldorf.

THE NEW WOOL EXCHANGE BUILDINGS.

A large block of new buildings, connected with the recently-erected Wool Exchange, has just been completed in Basinghall-street, extending from that thoroughfare into Coleman-street. The site upon which the buildings have been erected is that known as Sambrook-court, which contained a number of old offices, all of which were cleared away. The Basinghall-street frontage is in the Renaissance style. The elevation is 72 ft. in height, a turret being carried to a height of 80 ft. above the ground level. The elevation, which is about 60 ft. in width, is faced on the ground-floor with Aberdeen polished granite, eight massive columns of this material supporting the upper portion of the frontage, which is in Bath stone, carved and decorated. The frontage has a range of five bay-windows to each floor. The main cornice at the top of the building is surmounted by a balustrade, and behind this is a Mansard roof, with dormer windows, and the cupola bell-tower, in which it is intended to fix a clock, and also, it is stated, a peal of bells. A special feature in the carving is that heads of several members of the present Cabinet, including the Prime Minister, Lord Kimberley, Sir W. V. Harcourt, and Mr. Chamberlain, are represented in the *façade*. Amongst other similar heads are those of the Lord Mayor, Mr. Hughes, of the Wool Brokers' Association, and Mr. Faithful, of the Merchant Taylors' Company. Other portions of the carving are symbolical of the Seasons, Agriculture, and Foreign Continents. The chief entrance to the building is in the centre of the Basinghall-street frontage, between the granite columns already referred to. There are four massive wrought-iron gates at the entrance, of elaborate design and workmanship. One pair at the carriage entrance from Basinghall-street, is 10 ft. in height and 6 ft. in width, whilst the other pair, giving access to the various offices in the buildings, is 6 ft. in height and 4 ft. in width. The fittings throughout the buildings of the large number of offices for tenants, are complete and costly. All the offices are warmed by Doulton's porcelain slow combustion stoves. In the basement, extending from Basinghall-street to Coleman-street, under the entire block of buildings, including the Wool Exchange itself, is an unusually large room containing an area of 10,000 ft., suitable for storage purposes, and which is easily capable of sub-division. There is a goods entrance to this apartment in White Horse-yard. The whole of the premises, from Basinghall-street to Coleman-street, including the Wool Exchange and the section of offices completed about twelve months ago, together with the buildings just finished, which complete the whole, occupy a ground area of about three-quarters of an acre.

The architect of the several buildings is Mr. John Gordon, under whose superintendence the whole has been carried out, Mr. J. Sim having acted as clerk of the works.

ARCHITECTS' CHARGES.

PARAIRE *v.* THE ALCAZAR COMPANY.

The following is a copy of the Referee's award in this case, particulars of which were given in our last:*—"In the High Court of Justice, Queen's Bench Division, between E. Lewis Paraire, plaintiff, and The Alcazar Company (Limited), defendants—Whereas by an order of Master Gordon made in this action, and dated 13th June, 1881, it was ordered that the following question arising in this action, namely, the matters of account herein, be referred for inquiry-report to me, Jno. Whichcord, or to such person as agreed upon by the parties, or in case of difference to be named by the Master. And whereas, by another order made in this action by Master Dodgson, dated 5th July, 1881 and made by consent of the parties, and upon reading the said order of 13th June, 1881, and upon the defendant company admitting their liability to the plaintiff except as to the amount due to him, and withdrawing the first paragraph of their statement of defence in the said action, it was ordered that the matters of account in this action directed to be referred for inquiry and report by the said order be referred for inquiry and report to me, the said John Whichcord, of Palace-chambers, Westminster, late President of the Royal Institute of British Architects, under Section 56 of the Judicature Act, 1873. Now, I, the said John Whichcord, having taken upon myself the burthen of the said reference, and having heard the said parties by their counsel and their witnesses, and evidence produced before me, do hereby report to the Court as follows: that is to say, that I have considered the matters of account in question in this action, and I find that the total amount due to the plaintiff in respect of the matters aforesaid was at the commencement of this action 1,043*l.* and no more. As witness my hand this 12th August, 1881.

(Signed) John Whichcord,
Referee.

Witness,—E. Edward Habutt, Merchant,
31, Lombard-street."

AN AUTOMATIC COUPLING FOR ROLLING STOCK.

Messrs. E. Thomas and S. Cowdery, gentlemen connected with the Railway Department in Sydney, N.S.W., have just perfected a most important invention, which has for some time stood the test of actual work on the Darling Harbour Railway Lines. Messrs. Hudson Bros., the eminent engineering firm, of Sydney, who are always ready to undertake and to carry out any improvements connected with railways, have taken great interest in the invention, and on the 1st of July invited a number of gentlemen to witness the second and final public trial of the coupling. Among those who responded to the invitation were:—Sir Henry Parker, Sir John Robertson, his Worship the Mayor of Sydney, Mr. G. Cowdery, the engineer of existing lines; Mr. R. H. Barnett, the locomotive engineer; Mr. J. Trevor Jones, city engineer; Mr. J. Barcett, colonial architect; Mr. A. Mountain, city surveyor; Mr. J. Rae, Under-Secretary for Public Works; Mr. W. Read, traffic superintendent. The constructor of the new coupling fully explained the nature of the invention, and stated that five fatal accidents had recently occurred, which might have been avoided if this invention had been in use. The testing train consisted of engine and tender, three trucks, and a break van. The coupling consists of a tumbling hook and adjustable link, which is strong, and stands out horizontally, but is capable of moving upwards, when the inclined plane on the projecting end of the hook strikes its underside. The strength of the hooks was fully and satisfactorily tested by attaching to the train about thirty trucks, many of them laden; whilst in motion, the trucks having the new coupling attached were frequently and easily uncoupled, and the general opinion was that the experiment was in every way satisfactory. Mr. Hudson expressed his conviction, before the large assembly, that the new coupling would be soon generally adopted. Patents have been taken out for Europe and the colonies.

W. C. T.

* See p. 250, *ante*.

THE BRAKE QUESTION.

Sir,—I think that it is time that the deplorable accidents which have occurred through the use of defective brakes should be thoroughly brought before the notice, not only of the profession of engineers, but also before that of the public. I can unhesitatingly say that the use of such a brake as Mr. Eames's would have obviated so fatal an accident as that which occurred at Blackburn a short time ago.

Unfortunately in England everything is ruled by influence, that influence being what in the United States would be called the influence of the "Almighty dollar."

The enclosed extract from the *Manchester Evening News* of August 5th may have a peculiar interest:—

"An exciting scene occurred at Miles Platting Station last night, a man named Samuel Wolstenhulme, factory operative, Middleton Junction, as well as the stationmaster (Mr. Mayo), and the inspector (Mr. Clough), at Miles Platting, nearly losing their lives. It appears that Wolstenhulme had been across the double lines to the booking-office, and as the 6·30 Middleton train was entering the station, he ran in front of it for the purpose of getting on. Jumping on the high platform, he missed his footing, and fell on his head on the stonework, stunned, falling from there on to the line. The affair was witnessed by both the stationmaster and the inspector, who sprang to the stunned man's relief. Both seized hold of him at the same time, but both slipped, and all three fell on to the line. Fortunately, the occurrence had been seen by the driver of the train, and the brakes were applied. The three men had a marvellous escape, the train stopping a few feet only from them. Wolstenhulme was seriously injured by his fall."

It is somewhat amusing to me to have it asked in a certain journal "if Mr. Campin has heard of Westinghouse's brake"; but it is beneath my notice. Francis Campin.

Sir,—I have read with interest your remarks in recent numbers of the *Builder* on continuous brakes, and on the Blackburn accident, and hope you will allow one who, as a constant traveller, takes an interest in the continuous-brake question, to make a few remarks. I do not think you are quite warranted in thinking powerful (and trustworthy) continuous brakes liable to cause danger. I myself live on the Brighton Railway, about 1,400 of whose passenger stock are fitted with the Westinghouse brake, and have been a constant daily traveller for more than fifteen months, and all this time, though very quick stops are made, I have never once overshot the platform. From the evidence, the Blackburn accident seems to have arisen from the driver's not applying the brake in time, and not by its failure to act. He was not accustomed to drive the Manchester express, and was not quite acquainted with the brake's action! He had evidently heard the brake was very powerful, and thought its stopping powers were unlimited, and so thought he could stop a train running down a steep incline at over forty miles an hour in thirty yards from a block on the line.* The sad result was not the brake's fault. I am afraid it is very likely his statement as to the failure of the brake was an excuse for his ignorant rashness.

The best continuous brake should not be used at all to stop at termini or important junctions, and this is forbidden by most railways. That it is never so used on the Brighton I can witness; the brake is applied some distance from the terminus, and the train runs in at a moderate speed, and with ample space to be stopped by

* Precisely the evil to which our article points.—Ed.

the hand brakes. As I said, however, the Westinghouse never fails, when applied in time, *i.e.*, at 100 yards at thirty miles an hour, and a proportionately longer distance at greater speed. In Friday's *Times* it is stated a train fitted like the Manchester express was stopped in a space of 231 yards at forty miles an hour down a gradient of 1 in 82. This is a very short distance, and shows that the express driver must have been off his head when he attempted to stop at that speed in thirty yards. However, we shall doubtless have the matter made clearer when the Board of Trade report is published.

H. C. S.

CONDITION OF FAREHAM.

Sir,—Your correspondent, "Quæstor," has evidently found a "mare's nest" here. Fareham was one of the first places in England to adopt the Public Health Act, 1848, whilst far from being one of the worst in point of necessity; and it has had for over the last twenty years a most valuable system of drainage, water-supply, paving, lighting, streets and roads improvements, &c., in operation, equal in these respects to any other town of its size, and adopted and carried out before other towns of much greater magnitude.

The system of sewerage is known to the Local Government Board Inspector. It is the "Filtration" system, the solids being retained in tanks, removed periodically, and used as an agricultural manure. The effluent water, after filtration and deodorisation, passes out into the salt water, miles away from Portsmouth, and has no injurious effect whatever. There is not the slightest foundation for saying that the sewers are choked or the cellars flooded. In times of flood some exceptional difficulties have had occasionally to be overcome, but where is the place that has not difficulties at such times? Ours are exceedingly slight, and not to be mentioned in comparison. A flap-trap has been inserted in any case of back flooding, which is an effectual remedy.

With regard to the water supply, it is of the purest character, coming from the Portsdown Chalk Hills. The system is continuous during the day-time. It is turned off during the night to save waste.

The closing of one of the present churchyards and the provision of a cemetery is now the subject of correspondence between the upper and local Boards.

The sanitary rate has always been considered high here; it is now 3s. 8d. in the pound per annum, exclusive of poor-rates, water-rates, &c.

Fareham is mentioned in the directories, and is known to be one of the most agreeable and healthy towns in Hampshire; and, happily, no epidemic has occurred here for many years.

If "Quæstor" had applied to me, I could have given him any information; there would then have been no occasion for his troubling you.

Alfred Driver,
Clerk to the Local Board of Health.

"DAMP: A QUESTION."

Sir,—In building my house seventeen years ago, in Wimbledon Park, on gravel (not on clay), I took the following precautions against damp. Foundation on a yard of concrete up level with the excavation, two courses of slate above footings, land drain-pipe all round ditto, a dry area where the ground was against the house, 8 in. of concrete over the whole of the basement, with 2 in. of Portland cement for finish, a 9 in. cement skirting to ditto, no drains under the house. I mention all this to show I took great precautions against damp.

Well, the first three months after we got in the condensation was so great that the servants had a mop to remove it, and the tradespeople so dirtied the passages in consequence, that as a remedy the cook had a small quantity of mason's dust, and well payed the Portland cement over the surface. The condensation then ceased, and we have never had any trouble since.

H. F.

New Market for Liverpool.—At a meeting of the Liverpool Markets Committee, it was decided by seven votes to two to recommend the City Council to pull down the Theatre Royal and erect on its site a wholesale fish-market at a cost of 73,000*l*. The Theatre Royal, although said to be the best designed theatre in Liverpool, has latterly been altogether closed.

LIVERPOOL EXCHANGE STATION COMPETITION.

Sir,—Referring to my letter of last week to you, I will now attempt to perform my promise.

There is, sir, a wide difference in such competitions as this, and ordinary ones. Here was not a question of taste, on which we all may differ. The reason for this competition was to improve the existing disconfiture in *levels*, practicable inlets and outlets, &c.; and well we know that anything less than 1 in 30 must be out of the question for a 27 ft. rise on granite setts, yet nearly all competitors have got 1 in 15.

Did Sir John Hawkshaw desire to ignore existing facts, that such a gradient as 1 in 15 would not be sanctioned in such a case by any of his brother engineers?

I recently noticed an account in the *Citizen* of the new large buildings for Bishopsgate Goods Station (Great Eastern Railway), most important buildings, and there they have 1 in 27 for 17 ft. 5 in. rise.

Did Sir John overlook some of the designs by accident?

There appeared an able letter in *Engineering* of last week from Mr. Blackbourn, C E, who after, to my mind, satisfactorily proving that the three premiated designs should be out of court on account of levels, exits, and entrances, asks if there is no design sent in to fulfil the conditions? I can honestly reply to this in the affirmative, by pointing out a design I feel almost certain must have been lost sight of, the motto of which is "Direct." It has a cab inlet and outlet where required, viz., opposite Moorfields, and of a practical gradient of 1 in 20, with passengers' thoroughfares at each important approach; Fithebarn-street with shops and offices; emigrants' accommodation ample, and cut off from passengers.

Architectural detail was, I anticipate, outside the question altogether; but in this design the elevations were simple and honest, and I take simplicity and stability of work to be all that is required for a railway station. The greater consideration should be the best convenience to be obtained for the public. Is there in this country any modern built railway station having a gradient of 1 in 15 or a 27 ft. rise?

I am at a complete loss to see the grounds on which so able a man as Sir John Hawkshaw based his awards; it would be very satisfactory to know what they were. Surely the directors and shareholders will institute a more searching inquiry into these facts of levels, &c., for what I have stated are plain defects, and although I have particularised one special design, there may be others equally demanding attention.

I will say nothing about the three awards being made to three Manchester men, but it is certainly a coincidence.

A Non-Competitor.

P.S.—As Mr. Blackbourn truthfully points out, the Board of Trade requirement for raising a main country road macadamised with a rise of 18 ft., is a gradient of 1 in 20.

THE VERGERS OF YORK MINSTER.

The Very Rev. the Dean of York has written the following reply, we will not call it answer, to our correspondent "F. S. A.":—

I venture to think that it is scarcely fair that those who are filling responsible positions should be publicly assailed by anonymous correspondents in the newspapers, and I should be glad if the editors of all respectable papers would exclude such communications from their columns. As regards the vergers of York Minster, I can only say that I believe they are very anxious to perform their difficult and often delicate duties with courtesy and efficiency. I have from time to time received anonymous imputations concerning them, which I have treated with the contempt such communications deserve. The only complaint which I have received substantiated by names and dates I carefully inquired into, and found that the verger in question had simply and temperately carried out his orders, and that he had been very rudely treated. The visitors to York Minster comprise a large number of persons of various degrees of intelligence, and it must be very difficult to give information which shall be equally acceptable to persons of very different capacities and education. The anonymous correspondent of the *Builder* does not give us any clue as to his own mental capacity, or inform us what grade of information would have satisfied him; but I may say that, during my residence at York, many visitors to the Minster have afterwards been guests at the deanery; and many have gone from thence to the Minster and returned, and I have heard nothing from them but expressions of approval of the genial courtesy with which they have been treated by the vergers, and of the interesting information which has been imparted to them. If anybody, whether a resident in York or a stranger, has any complaint to make, I shall be at all times ready to hear it, to inquire carefully into it, and to give such redress as I feel that it deserves. At the same time, I feel myself bound to protect the vergers as long as they are doing their best to discharge the complex and difficult duties of their office from any frivolous, groundless, or cowardly complaints which may be made about them.

Arthur P. Purey Cust, Dean of York.

"THE ENGLISH LAND SYSTEM."

Sir,—The above is the heading of a letter appearing in your journal of the 6th instant [p. 192], signed "B. H. Thwaite," &c.

If you will allow me to make a few remarks upon your correspondent's suggestion (No. 1) in that letter, I shall feel obliged.

Mr. Thwaite suggests that there should be "such an alteration of the land laws as would make it possible for any farmer to become possessed of the land he cultivates in a certain number of years," &c. Such a consummation is possible even now, provided, of course, that the present owner of a farm thinks proper to sell it to his tenant.

Now, does Mr. Thwaite mean that he wishes a law made to compel the owner of a farm to sell it to his tenant "in a certain number of years," if the tenant desires it? If he means that, he is advocating a very dangerous doctrine, and one possibly that he might repudiate if he saw the working of it; for he may be sure that other interests besides that of the ownership of the land would come to be dealt with in the same manner when once such a course was commenced. Tenants and hirers of every description of property would want it to be made possible that, "in a certain number of years," they may become possessed of the ownership of the property they rented or hired, and, following the same principle through all the affairs of life, we should arrive at the very acme of confusion.

The views I have set forth are, of course, patent to yourself, sir, and your correspondent himself may, as much as I do, deprecate the full outcome of his suggestion, if it was ever made the law of the land.

I could remark upon other portions of Mr. Thwaite's letter, but it would trespass too much on your valuable space.

H. M.

LAND IN ENGLAND.

Sir,—It is very satisfactory to learn, on the authority of the President of the Board of Trade, in his speech at Ipswich, a few days ago, that "our principal industry is still the production of wheat," and the statement may serve as an antidote to the gloomy view expressed by your correspondent, "A Hampshire Man," in a recent issue [p. 93], who seems to think that, agriculturally at least, England is used up.

I am not one of those pessimists who have adopted that view, because I do not choose to ignore the fact that the succession of bad harvests we have experienced in England is, in the natural course of things, not likely to continue. The years of famine will assuredly be succeeded by years of plenty. What I fear most is that when the favourable seasons come, we shall not be in a position to take advantage of them. Our land is gone and is going clean out of cultivation. The complaint is in every county that agricultural land can neither be let nor sold. As a consequence, the income derived from land is, both to the owner and cultivator, either completely gone or has become very much reduced. To those limited owners who have only a life interest in their properties, and cannot therefore sell, and have no inducement or means to improve, and have besides in many cases heavy charges to meet for dowries and settlements, the position is very trying. This class of owner, which is much more numerous than is generally supposed, deserves our sympathy and assistance. I should propose to invest every present owner with a power of absolute disposal, and wherever there are settlements charged upon his land, he should have the option of disposing of the land provided he invested an equivalent in Consols or in Government annuities, either of which are certainly equal in security to the land itself. If he have an absolute power of disposal of his land, we may naturally expect in time to find that the younger children will get a share with the eldest, and if all land is compelled to have a registered title, we ought to have cheap and easy conveyance. With these changes and some fair average harvests, such, as I am thankful to say, we are likely to have this year in the Midlands, a desire to return to a country life and the cultivation of the soil will be a general feeling.

E. Grimes.

COCOA-NUT FIBRE MATS.

Sir,—A recent number of your paper contained a notice of the Furniture Trades Exhibition at the Agricultural Hall. I was in charge of Stand No. 1 of Messrs. Treloar & Sons, of Ludgate-hill, whose exhibits are noticed by your representative. The well-known high character and powerful influence possessed and exercised by the *Builder* induce me to ask respectfully the favour of space for a word of explanation, that I would gladly have given to your representative had an opportunity presented itself.

In your notice it is stated that "the first stand, for example, exhibits Messrs. Treloar's mats, some of which are in process of manufacture. They are excellent things of their class, as every one knows; but in those in which variety of colour and some slight ornamental treatment are adopted, we cannot but be struck with the raw and disagreeable tones of the colouring; yet these are from a firm which largely deals in importing Eastern rugs and druggets. Surely their own imports ought to teach them more in regard to form and colour in work of this class."

I presume that the "Imperial" mats shown are here referred to; if so, their implied defects as regards variety of colour, ornamental treatment, and character of design, are easily explained. Cocoa-nut fibre is an intractable material in its natural state; but an unscrupulous use of dye stuffs, and even the process of bleaching, would greatly extend the scope for varieties in colour and design, and might even make it possible to imitate the colours and designs of Eastern rugs and druggets, but at the expense of the non-absorbent character, strength, and durability of the material, which by bleaching and dyeing is made soft, limp, and flabby. The agents used in the bleaching process are sulphuric acid and chloride of tin. Dr. Letheby and other eminent chemists have expressed their professional opinion that bleaching destroys the durability of the material.

The mats we are referring to are made entirely of cocoa-nut fibre, unbleached, and without the application of any dye stuff whatever. Such varieties in tone and design as are obtained,—the range is necessarily limited,—are by the use, in its natural state, of fibre imported from different tropical countries and islands, the brightest colour from Cochin China, the darkest from the Fiji Islands, and the middle tints from Ceylon and Japan.

It is hoped that as good use as is possible is made of these materials for slight ornamental treatment; if not, the goods are fairly open to adverse criticism.

J. Mould.

STAINED GLASS.

London.—A memorial window to the late Mr. Joseph Mills has been recently placed in the Church of St. Stephen, East India-road. The three lights contain the subject of "Our Saviour preaching from the Ship," with appropriate emblems in the tracery above. The work was executed by Mr. George Rees, of Lamb's Conduit-street.

Leire (Lutterworth).—Three Munich stained-glass windows, by Messrs. Mayer & Co., have lately been erected in the parish church of Leire, near Lutterworth. They represent figures of St. Peter, St. James, and St. John, and are in memory of various members of the Richardson family.

CHURCH-BUILDING NEWS.

Brighton.—The Church of the Annunciation, Brighton, was reopened on the 7th inst., after enlargement from plans prepared by Mr. Scott, of Regency-square, under whose supervision Messrs. Cheesman & Co., builders, have added to the church on the south side an aisle capable of providing accommodation for about 200 persons. A new choir-screen has also been erected.

Shipbourne.—On the 6th inst., the Archbishop of Canterbury consecrated the new parish church of Shipbourne, Kent, situate midway between Tonbridge and Wrotham. The church has been rebuilt at the cost of Mr. E. Caralet, of Fairlawn. The building is Early English in style, and has been erected from the designs of Messrs. Mann & Saunders, architects, Westminster. The plan of the building is cruciform, and a substantial tower rises over the intersection of the chancel, nave, and transepts. The material used is Kentish ragstone (a considerable portion being taken from the old church), with Bath stone dressings. Internally there is a great deal of decorative work. At the east end is a reredos, made of pink alabaster, enclosing an *alto rilievo* of "The Last Supper," in white alabaster, which extends above the communion-table. The east window is in three lights, between which run slender shafts of green marble. The lights of the window display "The Crucifixion" in the centre, with the figures of Mary and St. John on either side; and underneath each of the three principal designs is a lesser subject. The walls of the chancel, on which "The Lord's Prayer" and "The Decalogue" are placed, are decorated. This portion of the interior is the work of Messrs. Mayer & Co., of Munich and London, who have also provided the other windows of the church, which are all likewise of stained glass. The building of the church has been carried out by Mr. Allcorn, of Shipbourne, under the superintendence of the architects, who, it is mentioned, were assisted in the drawings by Mr. Pearsall. Mr. Andrews acted as clerk of works. The whole of the woodwork, including the fine roof of the nave, is of oak, and accommodation is provided for about 250 people. The masonry work was undertaken by Mr. Hughes, of Maidstone. The pavements, which throughout are of marble mosaic, were laid by Messrs. Burke & Co.; and Gregory's patent wood-block floor has been laid under the seats. *Sgraffito* decoration in the Early English style adorns the walls of the nave. The execution of this was entrusted to Messrs. Trollope; and carved ornamentation both in wood and stone has been effectively wrought in various parts of the building by Mr. Bromfield. The lighting of the church has been provided for by Messrs. Edmundson, by means of atmospheric gas; and the fittings are the work of Messrs. Richardson, Ellson, & Co., who have also supplied the lectern. A "Gurney" stove is used for warming purposes. The total sum expended amounts to about 15,000*l.* The organ, which cost 800*l.*, was the gift of Mrs. Marshall, and the clock-tower that of Mr. Thomson Hankey. The church, which stands on high ground in a beautiful district, replaces one rebuilt by Lord Barnard, at his own charge, in 1722.

Melksham.—The parish church of Melksham was re-opened on the 11th inst. after the completion of sundry improvements to the interior and the erection of a new organ. The alterations to the structure principally affect the chancel, and they have been executed by Messrs. Wall & Hunt, of Brimscombe, near Stroud, under the direction of Mr. Street, R.A. An entirely new ceiling of panelled oak has been provided for the chancel, and the walls of the chancel and chancel arches have been thoroughly cleaned. This latter work led to the discovery of some interesting work in the shape of portions of a Norman arcade running along a part of the north and south sides, with one pillar in the north-east angle. The entire cost of the alterations in the chancel has been borne by the lay rector (Lady Awdry) and the vicar of the parish (the Rev. Prebendary Warre). The new organ, which has been placed in what serves for the north transept, is the result of a fund commenced by the Rev. Dr. Wilkinson when he had charge of the parish, and which has since accumulated to 770*l.* The organ was built by the Messrs. Conacher, of Huddersfield.

Pulford.—On the 11th inst. the Duke of Westminster laid the foundation-stone of a new church at Pulford. The new building is being erected on the site of the old church, which has been recently pulled down. The latter had been some time in a dilapidated state, and the Rector (the Rev. J. R. Williams) having represented to his Grace on several occasions the condition of the church, the Duke, about last Christmas, signified his intention of causing a new church to be built. The work is expected to cost about 5,000*l.* The erection of the building is in the hands of Mr. J. Douglas, architect, of Chester, and Mr. Parker, builder, Eccleston.

Weeley, Essex.—The new church of this parish was consecrated on the 9th inst. It has been erected from the designs of Mr. E. C. Robins, by Messrs. Saunders & Son, at the cost of about 3,000*l.* The church consists of a nave and chancel, 80 ft. long, including walls, and 40 ft. wide, including the north aisle, which is 50 ft. long by 13 ft. wide internally, and is separated from the nave by an open arcade of three bays, sustained on stone octagonal piers, with moulded caps and bases. An organ-chamber is provided between the vestry and the chancel, opening to the chancel by two arches sustained on coupled and attached octagonal piers, with delicately-moulded caps and bases. A vestry, 16 ft. by 12 ft. 6 in., is provided. The northern entrance-door has an internal lobby enclosure, and an external open-timbered porch, enriched with cusped tracery to the heads of openings and to verge boards. The roof is covered with the old tiles as far as they would go, leaving the nave and porch to be covered with new tiles. The timbers of the roof, nave, and chancel are boarded on the inside between the trusses, and are panelled with raised mouldings. The chancel takes the form of a pointed vault, and the nave a multangular form approximating to a semicircle, the whole being stained and varnished. The aisle roof is open-timbered, sustained on trusses at intervals. The internal height of the nave is 33 ft., and the external, 40 ft., the chancel roof being 6 ft. lower. The internal width of the nave is 24 ft., and that of the chancel, 19 ft. The pitch-pine varnished chancel choir stalls are raised three steps above the nave, and the Communion-table five steps. The reredos is draped with tapestry, and an elegant embroidered cloth covers the table. The pulpit is of pitch pine, with open panels filled with cusped tracery, moulded coping, and angular shafts and caps and body, all sustained on a plain stone plinth. A similarly-designed pillar lectern is on the other side of the chancel. The benches are of deal, stained and varnished, and very comfortable. The old font has been restored and refixed, and the remains of an old piscina, found built up in the walls of the old structure, have been converted into a credence-table. With the exception of the boarded floor of the vestry, the whole of the church has been paved with wood blocks, laid on concrete to a simple pattern, by Mr. Gregory, of Clapham Junction. The chancel tiles were executed by Simpson, of London. The design of the building has been in keeping with that of the tower, which gave the key-note, and which belongs to the Perpendicular period.

VARIORUM.

"The Forcing Garden, or How to Grow Early Fruits, Flowers, and Vegetables," by Samuel Wood (Crosby Lockwood & Co.), is a little book containing a considerable amount of information. It professes to give "plans and estimates showing the best and most economical way of building glass houses, pits, and frames for the various classes"; but these are given so rudely that they are of much less value than they might be. Mr. Wood should have taken an architect into council. It is all very well to say that "a good gardener should be the architect of all glass and plant houses," but a man may be a very good gardener, and even know what should be done, and yet not be able to set it forth so that workmen could carry it into execution, and this is apparently Mr. Wood's case. Still, his book will be found useful.——The *Gardeners' Chronicle* for the 27th, which gives a full report of the International Horticultural Exhibition at Manchester, includes a double-page coloured plate, from a painting by Fitch, representing a group of orchids. It is exceedingly well executed; the modulation of whites and delicate pinks is capitally managed, and the result is a very pretty plate.——The August number of *Our Own Country* gives us a paragraph as to Old Houses in Hull:—"In Silver-street is the old White Hart Inn, and at the High-street end of Scale-lane is another curious house with a projecting front. Formerly this was one of the chief inns of Hull, under the sign of the King's Head, and it has more than once entertained royalty. At that time it extended backwards about a courtyard, round which ran a gallery on the first floor, as was the fashion in ancient hostels. This, however, has been removed, but the staircase which led to it still remains. There is another old house at the south end of the street, believed to have been the residence of the De la Pole family, and now belonging to the Charterhouse. This is a charity for aged persons, founded in 1384 by Sir Michael de la Pole; but the present building (in Charterhouse-lane) dates from the later part of the eighteenth century. The master's house was built during the Commonwealth. It shelters eighty-six pensioners, 'brethren and sisters,' to each of whom a chamber with stipend and allowances is allotted. In High-street is another house of rather more interest architecturally, but chiefly noted as the birthplace of William Wilberforce. It is a brick building in what may be called the Dutch style, and must be of a rather earlier date than it looks, as Charles I. is said to have been entertained within it by Sir John Lister."——A few hints from Cassell's *Family Magazine* for August, as to "Fire Insurance Policies," may serve as a useful reminder to some of our readers,—"It must be borne in mind that, by the printed conditions of the policy, the insurance company undertakes only to guarantee the insured against loss. No matter for what amount the insurance may be effected, the company will not, in the event of a loss, pay more than what may have been the actual value, at the time of the fire, of the goods destroyed. For instance, the cost of a new building would not be paid should an old building or one wanting repair be destroyed, nor would a half-worn-out carpet or article of furniture be replaced by a new one. In effect, the company says, 'You may insure your goods for any amount you like, but should a fire happen, you must give us as detailed an account as possible of the articles destroyed or damaged, showing their values at the time of the fire.' For his own guidance, the insured should therefore keep at least a rough inventory of his effects, and revise it from time to time. It is a curious fact that, even with the most careful, the preparation of such an inventory generally shows household furniture in particular to be under-insured, the total value being almost invariably underestimated. While an insurance on household goods, clothing, &c., effected by the head of a family includes the property of all those members habitually residing with him, it would not protect the goods of a lodger or visitor, or of any member of the family not customarily residing under his roof. Nor does it insure any of his own property stored in any premises other than those mentioned in the policy; and therefore, in the event of such an ordinary occurrence as a change of residence, notice should be given to the insuring company of the expected time and places of removal, in order that the property may be held secured by them against loss by fire in either house. Should any member of the family, too, be visiting at a friend's, and a fire happen there, the insurance would not cover the clothing and property while away from the place mentioned in the policy. All these contingencies can, however, be provided for by special insurances."——Mr. Edward Walford, in undertaking to revive the *Sacristy*, expresses his determination to make it, in the domain of Ecclesiology and Sacred Archæology in all its branches, as good of its kind as is the *Quarterly* or *Blackwood* in the class of subjects with which they deal. Church architecture is to be one of the chief matters treated of, and the new number now before us includes a communication on the original position of the high altar in Salisbury Cathedral, by Canon W. H. Jones, of Bradford-on-Avon; and an elaborate paper on the existence of a recognised model or type adopted in the erection of churches before the time of Constantine, by Mr. Geo. Gilbert Scott, M.A., both illustrated. It is but fair to mention that the *Sacristy* is a Roman Catholic organ.——The *Holiday Number of Belgravia* is full of bright, pleasant stories, with here and there a dash of mystery, or it would not belong to *Belgravia*.

An Anonymous Donor has presented the handsome sum of 3,000*l.* to the building fund of the Birmingham and Midland Institute.

Miscellanea.

Bold-street, Liverpool.—New premises for Messrs. Van Gruisen, music-sellers, have just been erected in this well-known thoroughfare. The *façade* is described as being in a free French Classic style, carried out in white Cefn stone from near Ruabon, North Wales, with pilasters and columns in polished Shap granite, with bands of dark grey Aberdeen granite and polished Chesterfield stone bases. The entrance, placed in the centre of the building, has recessed and splayed sides to the shop-front. The upper portion of the building is spanned by a large arch, having on each side of the springing life-sized figures of Euterpe and Thalia. The whole of the ornamental carving on the premises has been carried out in the endeavour to make it symbolical of the use of the building, there being violins, trumpets, panpipes, flutes, and a variety of musical instruments, both ancient and modern, in the panels of the pilasters, and on the main frieze of the building. The floors are connected together by means of a large hoist, supplied by Messrs. Bunnett, of London, which is found to be a great convenience for moving the pianos from floor to floor. The building covers an area of 450 square yards. The architects are Messrs. E. & H. Shelmerdine. Messrs. Bennett & Sons, of Victoria-street, have supplied the hot-water piping which is laid round each floor; Mr. Ludwig Oppenheimer, of Manchester, the mosaic tiling; Mr. Cassidy, of Westminster chambers, Dale-street, the grates and mantel-pieces; Messrs. J. Hands & Co., of Birmingham, and Mr. James Lee, of Great Charlotte-street, the lamps and gasfittings; and Mr. Abbott, of Lord-street, the wrought-iron grille and gates. The carving is by Messrs. Dodd, Williams, & Evans, of Liverpool; the masonry by Mr. William Wood; the show-cases and fittings by Mr. Chas. Christall; and the whole has been designed and superintended by Mr. Henry Shelmerdine.

Paperhanging on Damp Walls.—A mode of hanging paper on damp walls has been patented in Germany. Lining-paper, coated on one side with a solution of shellac in spirit of somewhat greater consistency than ordinary French polish, is hung with the side thus treated towards the damp wall. The paper-hanging is then proceeded with, in the usual way, with paste. Any other kind of resin easily soluble in spirit may be used in place of shellac. A layer of paper thus saturated with resin is said to be equally effectual in preventing the penetration of damp. It is not stated how long lining paper prepared in the manner described will adhere to a damp wall. As far as we are aware, French polish peels off moist surfaces, or is decomposed by damp. However, the suggestion with regard to the new process remains a matter for speculation, and experience alone will solve the question. For this reason, it is worth while, in our damp climate, to try the experiment.

Macfarlane's Castings.—We spoke incidentally in our last of the attention paid by Messrs. Macfarlane & Co., of Glasgow, to the provision of sightly public conveniences. It may be useful to mention that one section of their illustrated catalogue, "Sanitary Appliances," gives complete information on the subject. It may doubtless be obtained without difficulty by parish authorities and others concerned.

St. Pancras Schools.—Quarantine Wards. The Guardians of the parish of St. Pancras have instructed Mr. H. H. Bridgman, architect, to prepare drawings for quarantine wards for twenty children, in sections of five each, as sent down weekly from the workhouse. Each section sent down weekly will undergo three weeks' quarantine before entering the schools. The wards will be combined with a new entrance lodge.

An important Series of Excavations has been carried on of late at the spot where the capital of the Dacian kingdom and of the Roman province of Dacia once stood. The remains of a Mithras temple have been unearthed, together with several inscriptions bearing upon the Mithras cult, and a collection of Mithras sculpture.—*Athenæum.*

Growth of Eastbourne.—We are told that Mr. Thomas Verity, architect, is now at Eastbourne, with a view to the erection of some buildings which will be a great addition to this watering-place. A sum of money, amounting, we believe, to over 100,000*l.*, has been placed at his disposal by a syndicate of financiers.

Kirkstall.—The partial decoration of the parish church has been completed. The work is wholly mural, and mainly on the chancel walls, of which the decoration is on a diaper ground, interspersed with a few bands of relieving colour. Above a dossal hanging are entablatures of six figures, painted on a dead gold ground, but mainly in outline, slightly tinted. On the wall north and south of the east window are John the Baptist and St. Stephen; and the north and south chancel walls contain the figures of the Four Evangelists. Each figure is surmounted by a canopy. The work is by Messrs. Powell Brothers, of Leeds.

Architects in South America.—According to *Engineering*, the Government of the Argentine Republic has issued invitations for competitive designs for a palace for the legislative assemblies, to cost about 36,000*l.*; a Catholic cathedral, to cost 58,000*l.*; a Palais de Justice, 26,000*l.*; a Government building (Government offices?), 22,000*l.*; and an Hôtel de Ville, also to cost 22,000*l.* Each of these buildings is to stand upon a separate piece of ground, 328 ft. square, and be surrounded with streets about 70 ft. in width, so that they will be well seen from all sides.

Brentford Drainage Competition.—The Local Board, acting on the report of Captain Galton, R.E., to whom the sixteen plans submitted in competition were referred, have awarded the first premium to Messrs. Gotto & Beesley, of Westminster. The estimated cost of the selected scheme is 17,800*l.* It is proposed to deal with the sewage by chemical precipitation in tanks, to be constructed on land adjoining the Ealing sewage works.

Ventilation.—We hear that the "Imperial" self-acting exhaust ventilators (Weaver's patent), which have been recently taken up by the Sanitary Engineering and Ventilation Company, of Victoria-street, Westminster, are being applied to the Shoreditch Town-hall for the ventilation of the council chamber. The company's "Imperial" ventilating tubes are also being fitted there.

TENDERS

For the erection of a block of six sale shops, a wholesale wine and spirit store, and a suite of warehouse and business premises, Nottingham. Messrs. S. Dutton Walker & Howitt, architects:—

Wooll & Co.	£8,750	0	0
Dennett & Ingle	8,523	10	0
Jelley	8,400	0	0
Wheatley & Maule	8,295	0	0
Hind	8,287	0	0
Lynam	8,178	0	0
Fish & Son	8,150	0	0
Bell & Son	8,138	0	0
Hewitt	8,071	0	0
A. B. Clarke	7,900	0	0
H. Vicken, Nottingham (accepted)	7,795	0	0

For the erection of residence, Castlebar Estate, Ealing, for Mr. H. Vernon. Mr. Walter Graves, architect. Quantities by Mr. H. C. Pollard:—

Stimpson & Co.	£3,783	0	0
Adamson	3,733	0	0
Penny	3,600	0	0
A. G. Bolding	3,600	0	0
Nye	3,598	0	0
Toms	3,563	0	0
Ward & Lamble	3,457	0	0
Grover	3,444	0	0

For two houses and shops, with printing-office, at Ripley, near Derby, for Mr. G. C. Brittain. Mr. R. Argile, architect. Quantities supplied:—

Contract No. 1.—Brickwork, &c.

Petts, Crich	£707	17	6
Warren, Codnor	639	10	0
Clower, Ripley	610	0	0
Wetton, Ripley (accepted)	589	0	0

Contract No. 2.—Woodwork.

Jackson, Ripley	466	0	0
Bird, Pinxton	443	0	0
Clark, Ripley (accepted)	440	0	0

Contract No. 3.—Plumbing, &c.

Anthony, Ripley	249	0	0
Shaw, Riddings	243	0	0
Frost, Ripley (accepted)	223	1	8
Holland, Ripley	218	12	2

For stabling, &c., exclusive of fittings, at Pendell Court, near Merstham, for Sir Geo. MacLeay. Messrs. Medland & Powell, architects. Quantities by Mr. R. C. Gleed:—

Longley	£1,882	0	0
W. B. Downs	1,450	0	0
Geo. Punnett & Sons	1,448	0	0

For additions and repairs at 19, Ramsden-road, Balham, for the London and South-Western Banking Company. Mr. F. W. Porter, architect:—

Potterton	£213	0	0
Smith, Norwood	189	0	0

For alterations and fitting-up the Balham Coffee Tavern, for the Balham Coffee Taverns Company:—Thomas Potterton, accepted.

For the erection of offices, for Mr. T. Lane. Mr. W. M. Holmes, architect:—

A. G. Bolding (accepted)	£3,645	0	0

For alterations and additions to Hume-street Board School, Sutton-common, Kidderminster, for the Kidderminster School Board. Mr. John Mossop, architect. Quantities by the architect:—

Harris	£470	0	0
Vale	450	0	0
Evans, Stourbridge	448	0	0
Price	441	0	0
Weidgway	409	0	0
Bale	407	0	0
Hitchman & Bennett	399	0	0
Binnian & Son	398	0	0
Thompson	390	0	0
Smith	387	0	0
Guest, Stourbridge	867	0	0
Howard & Sons*	350	0	0

* Recommended for acceptance.

For new lavatories, &c., at the Licensed Victuallers' Schools, Upper Kennington-lane. Mr. H. J. Newton, architect:—

Wood	£335	0	0
Cook	331	0	0
Beale	325	0	0
Vears	3 9	0	0
Pickersgill Bros.	249	0	0
Walker (accepted)	218	0	0

For alterations and re-seating to St. John's Church, Southall. Mr. E. J. Shrewsbury, architect:—

Hammond	£397	0	0
Woodbridge	330	0	0
Brown	298	10	0
Silver	288	0	0
Nye (accepted)	284	0	0

For works at Hayes Gate Farm, for Mr. W. Cotton. Messrs. F. D. Tuckett & Co., surveyors:—

Hollis	£1,447	0	0
Atkins	746	0	0
Nye	713	0	0
Hardy	697	0	0

For schools in connexion with St. Stephen's Church, Ealing. Mr. F. Ladds, architect:—

Gregory	£858	0	0
Adamson	837	0	0
Dorey	764	0	0
Nye	733	0	0

For fifteen cottages, at Ealing, for Mr. J. W. Tidy. Mr. Charles Jones, architect:—

Haynes	£2,950	0	0
Waters	2,565	0	0
Browning	2,490	0	0
Nye	2,212	0	0
Penny	2,145	0	0

For roads, gullies, and flags, for the Wanstead Board of Health:—

Mowlem & Co.	£350	0	0
J. J. Robson	339	0	0
Carter	330	0	0
G. J. Wood	3 2	10	0
G. H. Wyatt	299	0	0
John Taylor	250	0	0
J. Knight & Son	206	0	0
J. Kendell, Shacklewell (accepted)	190	0	0
G. Impey	176	15	0
John Richards	135	0	0

For new Catholic Church and Monastery, Bognor, for the Servite Monks. Messrs. Joseph A. Hansom & Son, architects. Quantities supplied by Mr. Henry Smith:—

E. C. Bisker, Worthing	£7,183	0	0
Chamberlain, Littlehampton	7,173	0	7
E. Marshall, Bognor	6,883	17	8
Stevens & Bastow, Bristol	6,699	0	0
E. Williams, Hampton Wick	6,917	0	0
Bromwich, Foster, & Co., Rugby	6,888	0	0
Charles Coles, Croydon	6,857	0	0
T. B. Rayner, Portsmouth	6,757	0	0
A. Smith, Bognor	6,475	0	0
D. C. Jones & Co., Gloucester	6,142	0	0
Charles Claridge, Banbury	5,320	0	0
George Huey, Dorset	5,143	8	0

Accepted for new dwelling-house and shop, Leyland, Preston, for Mr. John Whalley. Mr. David Grant, architect:—

Messrs. T. & J. Jackson, Leyland (brickwork).
Mr. Ed. Power, Leyland (stonework).
Mr. John Hunt, Leyland (plasterwork).
Mr. Thos. Cocker, Leyland (plumbing).
Mr. John Whalley, jun., Leyland (joiner's work).
Mr. John Heald, Chorley (ironwork).
Mr. Thos. Nickson, Preston (slating, &c.).
Mr. John Stones, Ulverston (revolving shutters).
Total amount of tenders, 616*l.*

For building a warehouse in Holly Bush Gardens, Bethnal-green, for Messrs. Warner & Rowe. Messrs. T. & W. Stone, architects:—

				Large roof.		
Forrest	£326	0	0	£145	0	0
Edwards	295	0	0	105	0	0
Beale	265	0	0	94	10	0
Judd	236	0	0	92	0	0

For the erection of villa residence on the Wimbledon-park Estate, Wimbledon, for Mr. P. Warner. Mr. E. G. Wyatt, architect:—

Ward & Lamble (accepted)	£2,200	0	0

For stables, at Hyde-wood, Chislehurst, for Mr. Edward Milner. Mr. T. C. Sorby, architect. Quantities by Mr. Jno. Scott:—

Gregory, Clapham Junction	£689	0	0
Bowyer & Sons, Norwood	689	0	0
Amer, Forest-hill	680	0	0
Penfold, Sydenham	597	0	0

For building new smoking-room, lavatory, &c., at the Star and Garter Hotel, Kew Bridge, for Messrs. Fuller Smith, & Turner. Mr. W. Nunn, architect:—

Robinson	£300	0	0
Brunsden	281	0	0
Hunt	275	0	0
Lamble	269	0	0
Nye	267	10	0

For the erection of a villa residence, at Kersal, near Manchester. Messrs. Risley & Bibby, architects. Quantities by Mr. H. Stone:—

Davies & Mawdsley	£2,388 0 0
Barker	2,335 10 0
R. Wood	2,329 1 0
Parkinson	2,225 0 0
Statham & Sons	2,190 0 0
Southern & Sons	2,190 0 0
Webster	2,100 0 0
Jones & Co.	2,099 0 0
Napier	2,095 0 0
R. Neild & Sons	2,080 0 0
Mabon	2,080 0 0
Warburton	2,075 0 0
Wilson, Toft, & Huntley	2,041 0 0
R. Whitell	2,040 0 0
Smith & Goodwin	1,998 0 0
J. Herd	1,997 0 0
E. Wood*	1,995 0 0

* Accepted, subject to revision.

For additional buildings at the Industrial School for Boys, Kingsnorth, near Ashford, Kent. Mr. F. W. Ruck, county surveyor:—

Steddy, Joy, & Steddy, Ashford	£3,148 0 0
Parsmor & Son, Margate	7,740 0 0
G. H. Denne, Deal	7,358 0 0
Draper Fowler, Ashford	6,983 0 0
Wallis & Clements,* Maidstone	6,946 0 0
D. C. Jones & Co., Gloucester	6,960 0 0
G. Prebble, Folkestone (withdrawn)	6,890 0 0
A. Matthews, Dover	6,627 0 0
F. Vaughan, Maidstone	5,646 0 0

* Accepted.

For rebuilding Plough Bridge, Lewisham. Mr. F. W. Ruck, county surveyor:—

Mowlem & Co., London	£3,628 0 0
T. Lansbury, Bromley	3,492 0 0
S. Chafen, Rotherhithe	3,485 0 0
Acock & Co., London	3,394 11 11
Shaw & Co., London	3,195 0 0
W. Burton, Herne Hill	2,936 0 0
F. Vaughan, Maidstone	2,745 0 0
Ball & Gammon,* Gillingham	2,715 10 0

* Accepted.

For residence, Newtown, Montgomeryshire, for Mr. E. Powell (stables not included). Messrs. Jones & Parke, architects. Quantities supplied by the architects:—

C. Davies, Newtown	£1,504 0 0
Morris & Sons, Newtown	1,491 0 0
E. Williams, Newtown (accepted)	1,342 0 0
Stables.	
E. Williams, Newtown	196 18 0

For alterations and additions to Primitive Methodist Chapel, Newtown, Montgomeryshire. Messrs. Jones & Parke, architects. Quantities not supplied:—

	Old Materials.
Powell, Whitchurch £740 0	£21 0
J. Williams, Newtown 631 0	15 0
E. Davies, Newtown 620 0	22 0
Morris & Sons, Newtown ... 530 0	—
E. Williams, Newtown 530 0	15 0
E. C. Phillips, Newtown ... 530 0	22 0

For alterations and additions to premises, Newtown, Montgomeryshire, for Mr. E. Soley. Quantities not supplied. Messrs. Jones & Parke, architects:—

J. Williams	£160 0 0
E. C. Phillips	137 10 0
Morris & Sons	98 0 0

For new Sunday Schools at Cottage-green, Camberwell, exclusive of heating, glazing, and seats. Mr. John Edward Sears, architect:—

Fredk. Higgs	£1,443 0 0
Wm. Smith	1,389 0 0
John Marsland (accepted)	1,215 0 0

For pulling down and rebuildwg No. 22, Budge-row, Cannon-street. Mr. E. Evans Cronk, architect. Quantities supplied:—

J. C. Richardson,* Clapham	£3,129 0 0

* Accepted.

For one pair of villa residences on the Mount Pleasant Estate, New Malden, for Mr. John Wollstein. Mr. T. Lockwood Heward, architect. Quantities supplied:—

H. Thorn	£1,250 0 0
Geo. Norman	1,193 0 0
J. E. Sanders (accepted)	1,147 0 0

For work at No. 30, Gloucester-place, Portman-square:—

Hackforth	£2,101 0 0
Clark & Mancoch	1,870 0 0
Smith	1,550 0 0
W. Phillips & Son	1,383 10 0

For external and internal painting, Clergy Orphan School, St. John's Wood. Mr. H. Winstanley, architect:—

W. Phillips & Son (accepted).

For new drill-hall and cottages, Wokingham, Berks, for Mr. A. F. Walter. Messrs. Brown & Albury, architects:—

Wescott (accepted)	£2,359 0 0

For new hotel, Blagrave-street, Reading, for Mr. Geo. Collins. Messrs. Brown & Albury, architects:—

Wernham (accepted)	£3,177 18 4
Plumber, Painter, and Glazier's Work.	
Moffatt	376 10 0

Accepted for new shop-front, Duke-street, Reading, for Messrs. Holbrook & Hall. Messrs. Brown & Albury, architects:—

Denton	£233 0 0
Shutters and Blinds.	
Haskins	61 9 10

For the erection of dwelling-house, alterations to business premises, &c., for the Trustees of the Great Stone Bridge, Edenbridge, Kent. Mr. M. Laurence Caley, architect:—

D. Goodwin	£975 0 0
Jordan	965 0 0
Head Bros.	930 0 0
Dives & Co.	902 0 0

For the erection of a small farm-house, at Ford Manor, Lingfield, Surrey, for Mr. J. Spender Clay. Portion of materials supplied. Mr. M. Lawrence Caley, architect:—

D. Goodwin	£675 0 0
Head Bros.	569 0 0
Dives & Co.	536 0 0
H. Ridley	390 10 0

TO CORRESPONDENTS.

The Late Mr. Harvey Eginton.—We have received information on the subject from Mr. George Truefitt.

W. F. B (no such statement has been made by us. The award in question was for "general excellence").—Hanson (if the employer ordered plans, &c., the person who made them, whether a qualified architect or not, could recover an *ad valorem* charge for them).—W. P. & Son (should send names and amount).—R. C. G.—E. E.—A. G.—J. M.—R. A.—Bordian.—H. J. N.—S. P. S.—T. H. C.—Sir J. A. P.—H.—N. H. L.—L. S.—M. P. B.—M. and L.—H. & Co.—Alpha.—R. & B.—M. & Co.—T. F.—F. W. R.—G. T. C.—J. P. R. C. H.—R. W. B.—R. S.—J. C. & Son.—T. L. H.—A. G. B.—S. D. W.—M. V. & M.—Fairplay.—B. R.—S. R. L.—J. F.—G. & B.—P. P. & Co.—P. Bros.—T. C. S.—B. & A.—W. & L.—G. W. T.—A. S. J.—M. L. C.—D. G.—J. W. B.—T. N.

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The Builder.

VOL. XLI. No. 2913. SATURDAY, SEPTEMBER 3, 1881.

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The Thames Conservators and the Avoidance of Pestilence.

THE Conservators of the River Thames, in their Report for the year 1880, have fully justified the wisdom of the advice which we ventured to give with reference to their mode of proceeding in face of the Metropolitan Board of Works. At the very time of the publication of their report, public opinion is beginning to make itself heard on the subject in a manner that will soon become unmistakable. The utter absurdity of administrative and legislative effort for the protection and restoration of our rivers being attempted while the chief river is daily polluted by the most important municipal body in the kingdom, without the slightest pretext of sanitary precaution, is really too humiliating. With what force can the Local Government Board call upon Reading or any smaller riverain towns to divert their sewage from the Thames, while the mighty and unclean flow of London is silently accepted and endured? Not that it is silently endured by any riverain inhabitants from London Bridge downward, but what are such petty protests compared to the dignity of the Metropolitan Board of Works,—a Board, too, flushed with its triumph over the more ancient but less adroit body, the Conservators of the River Thames?

The Conservators tell us in their report that they "deemed it advisable that an inquiry should be held under sections 20 and 21 of the Conservancy Act of 1870." When it was first publicly known that this opinion was entertained by the Conservators, we took occasion to give reasons for concluding that to demand such an inquiry was only to court defeat, and to defer indefinitely the purification of the river. To say nothing of the character of the bar,—not in the river, but wearing wigs and gowns,—and of the technical and business-like array brought together for the attack on and the defence of an intolerable nuisance, if the Conservators had been as well served as their opponents, it was certain that they were basing their acts on very slippery ground. It is a matter of evidence that the Conservators of the Thames have materially improved the channel of the river, and that such improvement is still in steady progress. It is matter of notoriety that the Metropolitan Board of Works are outraging the primary principles of sanitary reform, relying on a technical oversight in the Act of Parliament, for which, if we are not very much deceived, that very Act contains a remedy, if wisely applied. It was certain, from the tone of the correspondence which had preceded the appeal to the Board of Trade, that the Metropolitan Board would resort to any expedient which they thought calculated to nonsuit the Thames Conservators. Independently, then, of that diametric contradiction of scientific witnesses which might have been anticipated, the attempt to prove material obstructions in a constantly improving channel was one evidently attended with the utmost difficulty, and the most serious doubt. Had the Conservators taken their stand on principle, the case would have been altogether different. They might have said, "The position of the Metropolitan Board of Works is quite anomalous. It is easy to explain how it has become what it is. We admit that, however it came about, we are precluded from doing our duty with regard to it. We may strain at the gnat of any petty provincial sewage, we must swallow the camel of the London sewage. This is an injustice, an iniquity, and a danger, which Parliament never contemplated, and to Parliament we must look for a remedy. But, mean time, is it true that these polluters of the Thames are within the four corners of the Act of Parliament? We maintain that they are not. While allowing the Metropolitan Board (pending the completion of the arrangements for sewage utilisation, which came to nothing) to pump the sludge into the Thames, the Act still stipulated that they must keep the sewage poison out of the river above Bridge. This they do not. As to this there is ample evidence. While the abomination at Barking is greater than can be well described, the Thames through London is, year by year, becoming more and more polluted by the sewage brought up by the flood. There is not enough time during the ebb to pass the volume of filth into the river, and the consequence is to be traced to London Bridge, to Westminster Bridge, to Battersea Bridge. The very *raison d'être* of any exceptional privilege granted to the Metropolitan Board is negatived. The Board is absolutely without defence, except defence of the pettifogging order."

Had this tone been taken by the Thames Conservators they would have at once received the warm sympathy and the full support of all sanitary reformers. And of two things one must have followed. On an application to the Master of the Rolls, who had already done justice in similar cases, the Conservators would either have obtained an injunction or not. We are of opinion that, if their case had been put as it might have been put, they would have obtained one. Not peddling as to measurements of mud, more or less thick, here to-day and gone to-morrow, as to which evidence and counter-evidence were equally valueless,—if the Conservators had stood on the main points of public policy, general tenour of legislation, abominable nuisance, and failure on the part of the Metropolitan Board to perform their part of a bargain which they drove to its utmost letter of limit, we believe that the law is strong enough to protect the Londoners from nuisances involving a risk of pestilence.

Suppose it were not so. Suppose that we were wrong, and that the Court had decided that the Metropolitan Board were in a position so little contemplated by any writer on English law that they had a Parliamentary title to commit an intolerable nuisance. What then? Would it not have become apparent, on the very face of the proceedings, that a case of oversight existed which it was incumbent on Parliament to rectify?

In a word, instead of seeking to prove what they could not prove, the permanent condition of a constantly shifting river bed, had the Conservators taken our advice, they would have had the public with them, they would probably have had the Court with them, and, if not, they would ultimately have had Parliament with them. But they took the other course, and now it is *da capo*, with the disadvantage of having been both beaten and ridiculed. Are we misstating the case? What do the Conservators now say? "It should be noticed that the question of the pollution of the river could not be raised in this inquiry under the sections of the Act of 1870." Did we not say so in the first instance? Was it not courting defeat to say nothing of the true question, the main question, the question which was no question at all, but a palpable, malodorous, pestilential fact, and to special-plead about obstructions which were in doubt, and which were only discovered as a kind of flank attack on the main position of defence?

Is it to be wondered at, then, if, not only "during hot weather, when there has been little rainfall," but at other odd times, "complaints of the pollution of the river within and below the Metropolitan district frequently reach the Conservators?" "The pollution thus complained of," the report naïvely admits, "is indicated by the offensive odour and highly discoloured state of the water." Although the discharge from Kingston, Richmond, and other places "may in some degree affect the purity of the river near the metropolis, the Conservators think it can hardly be doubted that the chief cause of the polluted state of the river within and below the metropolis arises from the discharge at the outfalls and storm outlets of the Metropolitan Board of Works."

It is unfortunate that even in this plain statement of a fact with which any impartial person must agree, the Conservators admit a qualification which we hold is not admissible; "in whose district," they go on to say, that is in the district of the Metropolitan Board of Works, "ordinary sewage is exempted from the provisions of the purification section in the Conservancy Acts." Is it so? That, of course, is the contention of the Board of Works. We do not

admit it, and certainly the Thames Conservators ought to be the last persons in the world to admit it. What is excepted from the jurisdiction of the Conservators is the discharge of crude sewage into the Thames at certain specified places, by the Metropolitan Board of Works, provided always that they keep the sewage out of the Thames within the metropolis. This they altogether fail to do. They may attempt to disprove that fact. It is for the Conservators to prove it, and the case of the Conservators is, not that ordinary sewage is exempted from the provisions of the Act, but that the special case allowed as exceptional in behalf of the Metropolitan Board (arising from known reasons) is not now existent. To pour sewage into the Thames in London is what the Metropolitan Board of Works has been prohibited from doing. It is what it now does. It is the duty of the Conservators to prevent them; and in a manly and straightforward attempt to discharge this plain duty, the Conservators may be assured of the sympathy and support of the public.

THE ARCHITECTURE OF MODERN ROME.

ON more than one occasion, in speaking of modern Rome, we have had, as our readers will doubtless remember, to refer with regret to the additions made to the Eternal City since it has ceased to be the City of the Popes and has become the capital of United Italy. The views we have expressed we find, if not exactly echoed, amply endorsed by so eminent a foreign artistic contemporary as *L'Art*, which in a recent issue, in devoting a short article to the subject of the architecture of modern Rome, does not neglect to wail bitterly over the degeneracy of the Roman architects, and their indifference to the great traditions of their classic and more modern ancestors. We, on our side, can fully endorse every sentiment uttered by our contemporary, and, indeed, to no one who may have recently visited the banks of the Tiber, and who may have known Rome in what may be called "the old days," can any expression of disappointment and regret come as a surprise. The *Times'* correspondent, in speaking recently of some important changes in Rome, not very unfitly referred to the mania possessed by the Roman authorities of treating their city much as Paris has been treated within the last generation, and still further following their model in the architecture adopted for the newly-built neighbourhoods. Paris, indeed, seems to serve as the sole model to the more actively employed Italian architects of the present day in their work of rebuilding and enlarging the old cities of the peninsula, which for so many centuries dictated the laws and standards of taste to the world.

From the very first moment of arrival in Rome the least observant stranger is forced to notice how apparently far is his ideal from that which he finds before his eyes. As he eagerly traverses the miles and miles of flat *campagna*, and finally finds himself landed at his journey's end, his illusions cannot fail to be cruelly shaken. If this effect is not caused by the railway terminus itself, a grandiose monument in the familiar Charing-cross, London Bridge, or Gare du Nord style, perched high on the classic summit of the Esquiline, it certainly cannot fail to be on the exit from the station, round which has grown up a huge new city of regularly laid-out streets, tall stone-built houses of the French boulevard type, to be met with in any of the great French cities. Later on the more artistically and classically disposed student may be to single out the still standing Baths of Diocletian and the tall cypresses, Michelangelo's cypresses of the Augustine cloister,—it is amidst the glare of brand-new houses and the stretch of a huge half-deserted piazza, threaded in several directions by tinkling tram-cars; the ruins once fixed serve, at least, to remind the stranger that he is in the City of the Cæsars. The impression of such a fact would, however, under other circumstances, be singularly shaken by the presence of so strikingly modern an edifice as the Ministry of Finances, or, as we should say, the Treasury buildings, not far from the railway station. Both features are, in an artistic sense, essentially commonplace, yet, it must be admitted, admirably serve the purposes for which they severally were intended. The Minister of Finances is lodged in a truly princely manner; his clerks are in scarcely less grandiose apartments; the corridors resemble the saloons of less magnificent edifices in other countries; but for the appreciative student in search of suggestive or pleasing effects, no memory will be borne away save that of pitiful wonder. Not far from this central feature of a new neighbourhood there is, we learn, to be built in a short time a huge art-exhibition palace, doubtless in a similar style to the Ministry of Finances, and new Rome, such as has risen within the last ten years round the railway station and the Esquiline, is rising in almost every quarter of the so long undisturbed city.

Our French contemporary has exactly touched the point when it remarks that the special character of the city which the modern Italians have improvised on the Esquiline is exactly that it possesses none. There is not in the whole new neighbourhood a single building, public or private, that can be said to be stamped with any Italian, still less Roman, peculiarity. The houses will doubtless furnish, as indeed they are intended to do, admirable lodging accommodation to suit the taste of the wealthy *bourgeois*, Italian and foreign, who have already invaded the neighbourhood; here, of course, no objection can be raised, though why all consideration of local needs, and especially of the climate,—so important and happily-seized a feature in the architectural work of the past in Italy,—should be markedly absent is a point which cannot fail to appeal to the observant eye. It is calculated to arouse surprise that not one of the Italian architects who directed the building of these houses should have given a proof of artistic inspiration. As our contemporary ironically remarks, it is not improbable that if there had been in any case any such desire, the authorities would at need have sternly repressed so untimely an intrusion or rather wandering of fancy. The sole edifices that attract the eye are the several Protestant churches which have been recently erected, and chiefly in the new quarters of the city.

Under such conditions, and this picture is applicable to the art of Italy from one end of the peninsula to the other, it is not difficult to foresee the near future of Italian art, unless some drastic measures, aided by a salutary reaction, are adopted to bring about a change.

THE STORY OF THE QUEEN'S PARK.

ONLY a few days have passed since the Park was gay with music and banners, and echoed to the shouts of a loyal multitude which had come to look upon their Queen and the tens of thousands of Scottish volunteers who marched before her in the pride of their patriotism.

In 1528, King James V. of Scotland commenced to build the palace of Holyrood. Maitland, in his "History of Edinburgh," following earlier records, tells us that the king enclosed a large quantity of ground in the neighbourhood of the palace "with a stone wall about three miles in circumference, which probably is nowhere to be paralleled; for, instead of trees and thickets for cover which other parks abound with, I could not after the strictest search discover a tree, in lieu whereof it is supplied with huge rocks and vast declivities which furnish the Edinburghers with the best of stones to pave their streets withal." A curious testimony to this statement, the existence of which was unknown to Maitland, is given in the Edinburgh Dean of Guild's Account Book for the year 1544, in which it is mentioned that the provost, bailies, and deacons of crafts, with a great part of the honest men of the burgh, consented to build at their own expense the whole of the breaches in the park wall that "circuit about Arthour Sett, Salisborie, and Duddingstone Crags, under protestation that their so doing prejudged not them concerning the causeway stones which they were accustomed to quarry from the said crags." In 1753, Maitland wrote, in continuation of the above statement, "I think it will not be amiss to observe that were they squared and sent to London, where they are in want of good stones to pave the footpaths or sides of the streets withal, they would turn to good account." In 1788 Arnot, in his "History of Edinburgh," writes,—"Of these stones considerable quantities are sent for paving the streets of London."

Arthur Seat, whether named from the probably mythic British king, or from the Gaelic title Ard-na-Said, the Place of Arrows, is the loftiest of the eminences once surrounded by the park wall, of which a considerable portion still exists as its eastern boundary; it is mentioned by Kennedy, a Scottish poet, who wrote previously to the close of the fifteenth century, "Arthur Sate, or ony higher hill." The oldest remains of bygone ages are to be seen on the face of the hill near Duddingstone, probably the work of agriculturalists in the age which followed that of the Crannoges and the Lake-dwellers. They take the form of a group of terraces, which consist of a flattish stripe, of varying breadth, from which rises a slope, at an easy inclination, to a similar stripe above, and so on to the highest of the series. It cannot be doubted that they are artificial, from the fact that they are in some cases sustained by a rude species of masonry. The late Dr. Robert Chambers, who inspected these and similar remains in other parts of Scotland, was of opinion that "there was but one reasonable solution respecting the origin of these terraces, and that is that they were designed for horticultural or agricultural operations at a time when the low grounds were either marshy or covered with forests." These terraces, wherever found, are styled by the country people "deases," or seats, a name which has also been bestowed on the line of crags to the east of the Hunter's Bog, which is now used as a rifle-practice ground. On a cone of the hill to the south of the "Lion's Head," as the top of Arthur Seat has been fancifully named, is a parallelogram of undressed boulder stones, which the late Mr. James Drummond, R.S.A., and secretary of the Royal Scottish Antiquarian Society, conjectured to have been the remains of a hunting-lodge erected when the Castle of Edinburgh and the town were one and the same, and the Forest of Drumselch, or Drumshench (the name is still attached to a portion of the western suburbs, and may be found in the Postal Directory of the city), covered the slopes of the Calton Hill and Arthur Seat. It was in this forest that David I. was miraculously rescued from the antlers of a furious stag by a cross which descended from the clouds, and his Majesty in gratitude erected the House of the Holy Rood, now known as Holyrood Abbey.

The only other remnant of antiquity enclosed in the park is the chapel of St. Antony, of which, with the exception of a portion of the northern wall, not one stone remains above another. No records exist to tell of its erection or when it was allowed to fall into decay. It was in good preservation at the commencement of the sixteenth century. In 1522, as we learn from the Edinburgh Dean of Guild's Account Book, 24s. 6d., Scots, were expended on the purchase of "three panels of glass for Saint Antony's windows, containing new glass 12 ft. and old glass 18 ft." Of the hermitage of St. Antony not a vestige now remains. The writer, in his boyhood, has often hidden from his companions in one of its cells, through which bubbled a spring of pure water. On the hill-side, immediately under the rock on which the ruined chapel stands, was a cairn of stones marking the locality of a murder in 1720. Nicol Mushet was a young man of some fortune, and had studied for the profession of a surgeon. For some time he led an irregular and dissipated life in Edinburgh. He was drawn into a marriage with a woman for whom he soon discovered he had neither affection nor respect, and he vainly tried by dishonourable means to obtain a divorce. At length the infatuated man borrowed a knife one day, hardly knowing what he wanted it for, and taking his wife with him towards nightfall, killed her at the spot once indicated by the cairn, which upwards of fifty years ago was removed to the gate leading into the old road to Portobello. Lockhart, in his "Life of Scott," speaking of the poet Crabbe's visit to Scotland, says, "But I shall ever regret that Crabbe did not see him (Scott) at Abbotsford, among his books, his trees, and his own good simple peasants. They had, I believe, but one quiet walk together, and it was to the ruins of St. Antony's Chapel and Mushet's Cairn, which the deep impression made on Crabbe by the 'Heart of Midlothian' had given him an earnest wish to see."

On the night of the 19th of September, 1745, Charles Edward encamped his troops on the side of Arthur's Seat, close to the village of Duddingstone (to this day may be seen some of the remains of the entrenchments), and on the following morning he marched to meet the army of Sir John Cope. The guns of Edinburgh Castle fired upon the little army, which soon got behind the shelter of the hill. Little more than thirty years later, Arthur's Seat was the scene of a strange military exhibition. The Seaforth Highlanders had been raised during the early part of the American war, under the idea, on their part, of not being obliged to serve out of

Europe. One morning, when at drill in the Leith Links, while in their ranks standing at ease, a clamour arose on the subject of their going abroad. Suddenly the whole body shouldered their firelocks, set off at quick march, and halted not till they gained the ridge of the hills, and fixed their head-quarters on the summit of Arthur's Seat, which they knew cavalry could not approach, and foot soldiers would not dare to attack. At length, Lords Dunmore and McDonald were deputed to enter into a parley with them, and matters were soon settled to the satisfaction of the mutineers. They had but one small favour to request, namely, "leave to shoot Finnie," the adjutant of the corps, which favour was politely declined.

Lord Mahon, in his "History of England," records that on the 17th of September, 1745, "Charles, till then at the head of his advancing troops, set forth to take possession of the palace of his ancestors. He entered the King's Park by a breach which had been made in the wall, and approached Holyrood House by the Duke's Walk, so termed because it had been the favourite resort of his grandfather, as Duke of York, during his residence in Scotland." The Duke's Walk, as it is still called by old people, and the level ground on either side, form the arena on which her Majesty has twice reviewed her Northern volunteers.

Of Salisbury Crags and St. Leonard's Hill there is but little to mention. On the latter, the Wizard of the North conjured up the cottage of David Deans and his two daughters, Effie and Jeanie, the shadow and the sunshine of his life. The footpath round the base of the Crags, formed early in last century to give work to the starving operatives of the city, and vulgarly termed the Radical-road, was a favourite resort of the inhabitants, as is shown by an extract from the *Gentleman's Magazine* of 1783:—"On the evening of the 26th of August, about seven o'clock, a considerable part of the rock called Salisbury Craigs fell down with a noise, which those who heard it at a distance mistook for thunder. Providentially from the badness of the weather, no person was within reach of the danger." This path, Sir Walter Scott writes, "used to be my favourite evening and morning resort when engaged with a favourite author or a new subject of study." The following is from the *Edinburgh Evening Courant* of October 29, 1728. "A person who frequents the King's Park having noticed a man to come from a cleft towards the north-west of Salisbury Rocks, had the curiosity some days ago to climb the precipice, if possible he might discover something that could invite him there. He found a shallow pit, which delivered him into a little snug room or vault hung with dressed leather, lighted from the roof, the window being covered with a bladder. It is thought to have been the cave of a hermit in ancient times, though now the hiding-place of a den of thieves."

THE CENSUS: POPULATION AND HOUSES.

THE Registrar-General prefaces his preliminary report on the Census of England and Wales by an almost disparaging remark touching the quantity and quality of the information contained in the document. Instead of apology, it challenges admiration of the industry and promptitude that must have been exercised to admit of the presentation, within such a short time as has been occupied in the task, of such a vast amount of digested, valuable, and interesting information. The books of the enumerators are under revision, and the result will appear with the detailed report, giving the ages, sexes, birth-places, occupations, civil condition, and other particulars regarding the people, and habitations occupied, unoccupied, and building, with much additional information connected with the numbering and classification of our population.

A highly interesting dissertation, historical and compendious, is given in the introduction, which is followed by a large number of tables containing suggestive information.

The first table gives the result of the enumerations of 1871 and 1881. According to last census, as compared with that of 1871, there were in England and Wales 4,833,844 inhabited houses, increase 574,727; uninhabited houses 380,684, increase 119,339; houses building 46,759, increase 8,956; population 25,968,286, increase 3 256 020; of these there were males 12,624 754, increase 1,565,820; and females 13,343,532, increase 1,690,200. The number of inhabited houses in 1801 was 1,575,923 against 4,833,844 in 1881; and the population 8,892,536, against 25,968,286. In the decennial period, 1801 to 1811, the rate of increase in the population was 14·30 per cent.; curiously, the rate from 1871 to 1881 is so near it as 14·34 per cent. From 1811 to 1821 the rate of increase was as high as 18·06 per cent.; and from 1851 to 1861 as low as 11·93 per cent.

Of the forty English counties, thirty-two show increased population, and eight counties a decrease. The aggregate decrease is 49,090. Cornwall is the most remarkable among the declining counties. The two divisions of the county, with 69,899 inhabited houses, show a falling off of 4,051 houses; the population, 329,484, has been reduced by as many as 32,859 persons since 1871. The census history of Rutland, the smallest county in England, is depressing. Like many other rural districts, it has no industries to absorb the natural increase in the population; it seems short of means, indeed, to maintain its inhabitants. The census of 1871 gave Oakham, the county town, 11,142 inhabitants, or 28 more than the population of 1861. In the census just taken its inhabitants are put at 10,978, or 164 fewer than it had in 1871. Uppingham, the only other town in the county, has 5,389 inhabitants, or 240 fewer than it had ten years ago. Two other sub-districts in the county, with 6,640 inhabitants between them, have a net increase of 26 in population. The decrease in the county is 639. It has 4,551 inhabited houses. The other counties that show a decrease are Cambridge, 1,431; Dorset, 4,795; Herefordshire, 4,328; Hunts., 4,094; Shropshire, 118; and Westmoreland, 826. Of the twelve counties in Wales, six have increased and six have decreased in population. The aggregate decrease in the six Welsh counties is 9,363, but the increase in the other six is 152,123, leaving a net gain of 142,760 for the Principality. Merthyr Tydfil, with 51,708, shows a falling off of 3,033, but other places in Glamorganshire show very large additions to their population, as, for instance, Pontypridd, with 93,479, shows an increase of 41,558 as compared with last census; Cardiff has 106,356 inhabitants, or 29,655 more than in 1871; Swansea has 95,068, an increase of 24,643. These three places have 49,786 inhabited houses, or 15,166 more than they had in 1871.

The increase in the population of some of the English counties is very remarkable. The population of Lancashire is 3,454,225, the increase being 634,730. The inhabited houses numbered 655,496, or 125,006 more than were enumerated in 1871. The houses building are 5,768, or 4,515 more than were in progress when last census was taken. The increase in Lancashire has been mainly in the south-eastern and south-western divisions of the county, that include Manchester, Salford, Liverpool, Warrington, Wigan, Bolton, Oldham, Ashton-under-Lyne, and a number of large manufacturing towns. The population of these two divisions of the county is 2,669,974; increase, 480,955. There are in the two divisions 503,411 inhabited houses, or 196,021 more than there were when the previous census was taken.

Liverpool and Manchester illustrate in a minor degree the tendency of population that London exhibits so notably, *i.e.*, to be attracted to important manufacturing and commercial centres, and to supply the day population of such places, but, when means permit, to find the home at some distance from such centres. The population of Liverpool proper is 210,161, being 28,250 fewer than in 1871; the inhabited houses, 31,678, are short by 2,615 of the number enumerated then. While this is so, however, there can be no doubt that the day population is fully sustained, if not increased, indeed, and the census tables leave no room for doubt as to where the Liverpool gentlemen find their homes. Toxteth Park, a suburb, has a population of 117,028, being an increase of 31,186 upon last census; it has 20,674 inhabited houses, or 6,519 more than it had ten years ago. It has also better play for the lungs than Liverpool. The seven districts in Liverpool that have sustained a loss of 28,250 inhabitants occupy an area of 2,470 statute acres, whereas Toxteth Park has 3,598 acres. West Derby, another suburb, has a population of 101,156, being an increase of 23,156; it has 18,885 inhabited houses,—an increase of 4,869; its area is 7,162 acres. Everton has a population of 109,788, the increase being 18,851; it has 19,120 inhabited houses, or 3,881 more than it had in 1871. In addition to these, there are many suburbs and places not far distant from Liverpool where the population and the number of inhabited houses have been very largely increased, such as Walton, Wavertree, Farnworth, St. Helen's, &c.

Manchester, also, is illustrating the tendency above referred to. In three of the districts of the city, Ancoats, Deansgate, and Market-street, there was a population of 89,674 at the last census, which was a reduction of 26,222 upon the enumeration of 1871; the inhabited houses, 17,442, were fewer by 3,750 than those enumerated in 1871. In Manchester proper, however, it should be stated, there is another large district, St. George, with a population of 59,131, being an increase of 1,039; inhabited houses, 11,994, an increase of 557. The three districts above referred to have an area of 1,148 statute acres. The Manchester men find homes in many of the pleasant localities that surround them, such as Choriton, Cheetham, Pendleton, Broughton, Didsbury, Altrincham, Bowden, Sale, Stretford, &c. In all the Superintendent Registrar's districts in which these places are embraced there has been a large increase in the population. Barton-upon-Irwell has a population of 72,825, increase 21,254; houses inhabited 14,344, increase 4,328; area 24,555 acres. Choriton has a population of 260,257, increase 48,873; inhabited houses 50,934, increase 9,454. Salford includes the pleasant residential districts of Broughton and Pendleton, the one has a population of 31,533, increase, 16,572; inhabited houses 6,162, increase 3,434. The other has a population of 48,409; increase 17,757; houses 9,525, increase 3,617. The two districts have an area of 4,711 statute acres.

Middlesex, with a population of 2,918,814, shows an increase of 379,049; inhabited houses 369,831, increase 48,602; uninhabited 30,592, increase 5,132; building 7,637, increase 3,228. It will be borne in mind in connexion with the above statement of population that London extends beyond Middlesex in various directions.

The Registrar-General treats London as consisting of a central area and beyond it a ring of districts, which is called the Inner Ring, and encloses "London Proper." "Greater London" is within a circle with a radius of twelve miles from Charing-cross, and embraces also parishes, any part of which is not more than fifteen miles in a straight line from Charing-cross. The population within the inner ring, or of London proper, was 2,803,989 in 1861; in 1871, it was 3,254,260; and in 1881, just enumerated, 3,814,571. The increase for 1881 is 560,311, as compared with the enumeration of 1871; and 1,010,582 as compared with that of 1861. The population within the Outer Ring, or of Greater London, is 4,764,312; being 878,671 in excess of that of 1871, and 1,541,592 in excess of that of 1861. The rate of decrease in the population in the Central area, including the City of London, is 7·8 per cent., according to the census of 1881. The rate of increase in the annular area, between the Central area and the Inner Ring, is 27·6 per cent.; over the whole of the area, within the Inner Ring, or London proper, the rate of increase is 17·2 per cent.; and within the Outer Ring, or Greater London, the rate of increase is 22·6 per cent., and has been 47·8 per cent. for the past twenty years. Greater London includes fifty-three parishes in Middlesex, thirty-five in Surrey, seventeen in Kent, 13 in Essex and ten in Hertfordshire. During the last ten years 6,388 houses in the Central area, previously used as dwellings, have been replaced by 3,045 houses that are only used for business purposes. The proportion of inhabitants of England and Wales who live within the Inner Ring or London proper, is one in 6·8. The average of persons to an inhabited house in England and Wales is 5·37, against 5·33 in 1871.

The areas, population, inhabited houses, and other particulars, are given in the census returns under a variety of groupings and divisions. They include abstracts of totals in enumerations from 1801 to 1881, with houses inhabited, uninhabited, and building; areas, houses, and population according to counties, and Parliamentary divisions of counties; to the Metropolis Local Management Act; to London School Board divisions; to London Police districts; Parliamentary boroughs; Urban Sanitary districts; Registration divisions; Superintendent Registrars' districts; and to Registration sub-districts. The table last mentioned gives more minute details than the others.

Referring to London, it appears that Kensington Superintendent Registrar's district embraces St. Mary, Paddington; St. John, Paddington; Kensington, and Brompton. It has an area of 3,441 statute acres; population

270,022, increase, as compared with enumeration of 1871, 52,910; inhabited houses 33,290, increase 5,708. Fulham, area 4,003 acres; population 114,811, increase 48,570; houses, 16,355, increase 9,163. Chelsea, area 796 acres; population 88,101, increase 17,363; houses 11,380, increase 6,395. St. George, Hanover-square, area 1,943 acres; population 149,603, decrease 6,684; houses 17,812, increase 731. Westminster, area 216 acres, population 46,456, decrease 4,725; houses 4,281, decrease 273. Marylebone, area 1,506 acres; population 155,004, decrease 4,250; houses 16,021, decrease 319. Hampstead, area 2,248 acres; population 45,436, increase 13,155; houses 5,869, increase 1,521. St. Pancras, area 2,672 acres; population 236,209, increase 14,744; houses 24,655, increase 552. Islington, area 3,107 acres; population 282,628, increase 68,850; houses 34,048, increase 16,969. Hackney, area 3,935 acres; population 186,400, increase 61,449; houses 27,503, increase 8,256. St. Giles, area 245 acres; population 45,257, decrease 8,299; houses 3,968, decrease 598. Strand, area 403 acres; population 33,514, decrease 7,825; houses 3,339, decrease 678. Holborn, area 816 acres; population 151,716, decrease 11,775; houses 15,184, decrease 1,271. London City, area 668 acres; population 51,306. decrease 24,677; houses, 6,548, decrease 2,867. Shoreditch, area 648 acres; population 126,565, decrease 599; houses 15,243, decrease 326. Bethnal-green, area 755 acres; population 127,006, increase 6,902; houses 16,663, increase 764. Whitechapel, area 378 acres; population 71,350, decrease 5,223; houses 7,602, decrease 670. St. George's-in-the-East, area 243 acres; population 47,011, decrease 1,041; houses 5,815, decrease 117. Stepney, area 462 acres; population 58,500, increase 810; houses 8,012, increase 196. Mile-end Old-town, area 679 acres; population 105,573, increase 12,421; houses, 14,047, increase 1,011. Poplar, area 2,335 acres; population 156,525, increase 40,149; houses 20,487, increase 4,225. St. Saviour, Southwark, area 1,119 acres; population 195,111, increase 20,062; houses 24,211, increase 897. St. Olave, Southwark, area 1,503 acres; population 134,586, increase 12,188; houses 17,324, increase 995. Lambeth, area 3,941 acres; population 253,569, increase 45,227; houses 35,082, increase 5,953. Wandsworth, area 11,488 acres; population 210,397, increase 85,337; houses 30,754, increase 11,600. Camberwell, area 4,450 acres; population 186,555, increase 75,249; houses 27,306, increase 9,534.

The increase and decrease in the numbers of inhabited houses and population in the Registrar's districts and the sub-districts of London fluctuate considerably. Between 1861 and 1881 Fulham and Wandsworth districts have had the lead. The Wandsworth district has increased in population 198·8 per cent. during the twenty years, and has increased 68·2 per cent. in the last ten years. Fulham has increased 188·6 per cent. in the twenty years, and 73·8 per cent. in population in the last ten years. Wandsworth is associated with Battersea, that shows an increase in population of 53,232 for the last ten years, with an increase of 6,681 in the number of inhabited houses; Streatham, that has an increase of 11,070 in its population; Clapham, that has added 9,031 in the ten years; with Wandsworth itself, increase 8,222; and Putney, with an increase of 3,782. It will be seen that the mere increase in the population of some of these sub-districts greatly exceeds that of many county towns. Fulham is associated with St. Peter's, Hammersmith, and St. Paul's, Hammersmith. The increase in the population of the last-named was 28,291; that of Fulham itself, 19,545. The increase of Kensington town during the decennial period was 28,482. The decrease of 6,684 in population of St. George's, Hanover-square, may excite surprise that should survive the reflection that St. John's and St. Margaret's, Westminster, are in the district, and should be associated with the Westminster district proper, in which Tothill-street and its purlieus have been swept away to be superseded by Victoria-street, the Royal Aquarium, and other modern buildings. The population of the Westminster district, including Golden-square, Berwick-street, and St. Anne's, Soho, sub-districts, has been reduced during the ten years from 51,181 to 46,456, decrease 6,684; and the inhabited houses from 4,554 to 4,281, decrease 273. This is exclusive of a reduction in the population of St. John's, Westminster, of 2,996, and of St. Margaret's of 3,177. In the St. Pancras district it may be remembered that Agar-town and Somers-town, and many unclean streets and quarters, were swept away to give sites for the grand station and hotel, the goods and coal stations, and other works of the Midland Railway Company. In the Somers-town sub-district the population has been reduced since the preceding census from 38,533 to 34,355, a decrease of 4,178, and the inhabited houses have fallen in number from 3,857 to 3,198, a difference of 659. In the same district, however, Kentish-town has, with its 87,388 of population, gained 19,190 in the last ten years, and has made up the number of its inhabited houses, 10,030, by adding 1,499 to them in the same period.

Large areas in various parts of London have had their populations dispersed, and the inhabited houses upon them razed, during the last ten years. This has been notably the case in the City, the localities of Holborn, Saffron-hill, Snow-hill, Whitecross-street, Clerkenwell, St. Clement Danes, St. Martin's-in-the-fields, Shoreditch, Cripplegate, and Castle Baynard.

In Cripplegate the population has been reduced during the ten years from 13,638 to 7,185, a reduction of nearly half; the houses for habitation, 818, are fewer by 756 than they were ten years ago. In Castle Baynard sub-district the population, 9,947, has been reduced by 5,502, and the inhabited houses, 1,360, by 584. In the Holywell sub-district, Shoreditch, the population has been reduced from 12,430 to 7,370, and the dwellings from 1,529 to 988. In Whitecross-street sub-district, with a present population of 9,217, the reduction has been 4,575, and the habitations have diminished from 1,430 to 835, a difference of 595. In the St. Clement Danes sub-district the population of 1871 of 10,723 has been succeeded in 1881 by the reduced number of 8,547, a decrease of 2,176, and the inhabited houses, 1,036, by 815, a reduction of 221. The sub-district of St. Martin-in-the-fields, Strand, has now a population of 17,447, whereas in 1871 it was 21,238; the inhabited houses are now 1,745, then they numbered 2,083.

The objects for which some of these districts have been depleted of their population and the inhabited houses swept away, and the uses to which the cleared areas have been applied, will be readily apparent to any one acquainted with London.

Of the twenty great English towns mentioned in the weekly reports published by the General Register Office, all have increased in population during the last ten years, except Manchester proper. The increase has been in Salford at the rate of 41·2 per cent.; Oldham, 34·8 per cent.; London proper is tenth in order, with an increase at the rate of 17·2 per cent.; Plymouth is lowest, with an increase of 9·2 per cent. The increase in the population of the United Kingdom from 1871 to 1881 has been at the rate of 10·7 per cent. Taken separately, of England, 14·5 per cent.; Wales, 11·7 per cent.; Scotland, 11·1 per cent.; Army, Navy, and Merchant seamen abroad, 12·4 per cent.; and *decrease*, Ireland, 4·7 per cent.; Channel Islands, 3·2 per cent.; and Isle of Man, 1·0 per cent. Of the thirty-eight English and Welsh counties that have increased in population, Surrey stands first, with an increase at the rate of 31·5 per cent.; Glamorgansbire, 28·6 per cent.; Durham, 26·6 per cent.; Lancashire is sixth, with 22·5 per cent.; Kent thirteenth, with 15·2 per cent.; Middlesex fourteenth, with 14·9 per cent.; and Bucks, last on the list of thirty-eight counties, with an increase of 0·2 per cent.

There are some gratifying indications of revived prosperity in certain towns and districts given by the returns of the last census. In 1871 Coventry showed a falling off in population of 1,538; Macclesfield had a decrease of 2,198 as compared with 1861; and Congleton a decrease of above 1,000. The staple industries of these places were supposed to have suffered from the commercial treaty with France; they seem to have partly recovered. At the last census the population of the Parliamentary borough of Coventry was 47,366, being 6,018 in excess of that of 1871; houses, 10,399,—increase, 1,065. The Parliamentary borough of Macclesfield has, in 1881, a population of 37,620, increase 2,050; houses 8,547, increase 105. Congleton, superintendent registrar's district, has a population of 38,010, increase 1,729; houses 7,813, increase 328.

Middlesbrough-on-Tees and Barrow-in-Furness are remarkable instances of growth in population and increase in the number of houses, their growth being attributable to the mineral wealth of the districts around them. In 1831 the population of Middlesbrough was 754; in 1861 it was 18,992; in 1871 it was, in the Superintendent Registrar's district, 60,037; and 1881 has reached to 89,871; increase in ten years, 29,834; houses 16,504, increase 6,005. Barrow had only a small number of scattered cottages about forty years ago. In 1861 it had a population of 3,300; in 1871 increased to 18,774 in the Superintendent Registrar's district; and to 47,276 in 1881,—increase 28,502; houses 6,787, increase 3,975.

The above are a few illustrations of disturbance or movements of population, for the greater part exceptional, and attributable to other causes than those upon which "natural increment" is calculated, viz., the birth-rate and the death-rate.

THE LONDON AND NORTH-WESTERN DIVIDEND, ACCOUNTS, AND HALF-YEARLY MEETING.

THE meeting of the London and North-Western shareholders on the 20th of August was remarkable for a very clear and manly speech from the chairman, Mr. Moon, the interest of which is far wider than even its importance as illustrating the movement of one of our chief companies might lead us to anticipate. Mr. Moon had to speak of those adverse circumstances against which the North-Western has had to struggle during the past six months, in common with other companies. He had also to speak of other matters which, while special to this great line, are of the greatest moment as illustrative of the financial, and to some extent of the social, disorders which have afflicted the entire kingdom.

As to one or two points, the special interest of the railway shareholders, as represented by the chairman, may be regarded as to some extent balanced against the public interest. Such is the case with regard to the tax upon passengers. Taxes, unfortunately, must be paid; and while we are spending 84,000,000*l.* per annum, Chancellors of the Exchequer must look sharp after all sources of revenue. It is Mr. Moon's contention that they look too sharply after the quota from his line. As to that we shall not venture to express an opinion further than to the effect, that if the law requires that a third-class passenger shall be taxed if the passenger is carried from terminus to terminus of the line without stopping, and not taxed if he stops at every station, such a law is not only contemptibly peddling, but is in direct opposition to public policy. Companies ought, in the public interest, to be encouraged to run as many through trains as possible. No less is it in their own interest to do so (although we hesitate to put that argument into the head of the tax-gatherer), as every stoppage of a train is a direct source of loss, at the same time in locomotive power, in maintenance, and in locomotive wages. Nineteen thousand pounds, the chairman complains, which ought to have gone into the pockets of the shareholders as dividend, are thus diverted by sharp practice into the coffers of the State.

If the taxpayer and the railway proprietor may be disposed to regard this question of railway taxation from opposite standpoints, the chairman of the London and North-Western Railway will receive even less sympathy when he mourns the rise of 2d. per ton in the price of coal, and of 12s. per ton on that of steel rails. No doubt, working cost and maintenance of way are augmented by this small rise of price. But any indication of improvement in trade is too eagerly looked for to allow many of us to repine at such signs. For the company, too, we have no doubt that augmented traffic will fully compensate them for such rise in prices. As to the 20,000*l.*, which was the cost of last winter's snows, it goes to the bad, with little compensation. As fighting against these adverse influences, and in presence of a steady decline in the length of the average passage journey, so that 230,000 passengers more have been carried in the half-year for some 7,000*l.* less than on the occasion with which it is compared, it shows very good management on the part of the company to have kept their working expenses down to 52 per cent. of gross income,—the more so, as the average cost on the railways of the United Kingdom for 1880 was, as we recently showed, 54 per cent.

There are, however, points in the speech of the London and North-Western chairman of far graver national import than are those to which

we have referred. The Irish traffic, which has long been increasing steadily at a rate which doubles the revenue from this source every five years, is now declining and failing. 10,000*l.* or 12,000*l.* less was expected to be taken than last half-year. The tourist traffic to Ireland is at an end. Killarney and other lovely spots of the Emerald Isle are without a single visitor. Nor does Mr. Moon find much ground for encouragement as to the future. Recent legislation, he thinks, shows no signs of mending Irish traffic. It is only to the hope of the conviction being produced in the minds of a keen-witted people that absence of law, order, and security brings with it absence of money, that we are encouraged to look forward. Considering the magnificence of the harbour works at Holyhead, and the large sums spent in providing the splendid steamers that now cross the Channel with such speed and punctuality, the failure of the Irish traffic is a bad look out for the railway companies, and a worse for Ireland herself.

Another evil influence to which Mr. Moon attributes a loss of at least 100,000*l.* in the income of the past year, is one which we have ourselves strenuously and persistently combated. It is the influence of those agitators who set class against class, and who teach the working man the false and ruinous doctrine that his interest is opposed to that of his employer. And what is, we confess, of special interest to ourselves, and we trust will prove so to our readers, is the fact that the accounts of the London and North Western Railway for the last half-year illustrate, by the incontestable evidence of figures, the advantage of following, and the disadvantage of neglecting, the advice which the *Builder* so urgently offered, to masters and men alike, on the occasion of the introduction into Parliament last year of the ill-omened "Employers' Liability Bill." Practically that Bill seems to have been an utter failure. Hardly anything has been heard of its operation. But on the one hand, 50,000 of the servants of the London and North Western Railway Company (or to be exact, 49,880 out of 50,000) have adopted our suggestion, and associated themselves with their employers in a mutual insurance bond. Mutual, that is to say, as to the subscription, but confined in its direct beneficiary results to the men. The company have paid 5,000*l.* during the last half-year to the credit of this fund, which is devoted, not alone to the payment of compensation for accident met with in the service of the company *by the fault of the company*, which is all that would be obtained under the Bill, but to give compensation and relief in case of any accident, and also in case of death from natural causes. In fact, the London and North Western Company insure their workmen's lives, as well as provide for compensation in case of injury to life or limb.

A noble piece of beneficence of this kind, proposed by the sound and enlightened policy of the directors, and gladly hailed with practical unanimity by the men, contrasts very forcibly with the efforts of those who have spurned our advice, and thought it wiser to fight for a part than to accept the whole with gratitude.

BUILDING AT CLACTON-ON-SEA.

A LARGE sale of land belonging to the Clacton-on-Sea and General Land Building and Investment Company has just taken place at the Public Hall, Clacton, Messrs. Harman & Matthews being the auctioneers. The auctioneer, in introducing the property, which consisted of 106 building plots belonging to the company, adverted to the continued growth of Clacton, observing that within the last twelve months one portion of the sea-wall had been built, whilst twenty new large houses had been erected at a cost of from 12,000*l.* to 15,000*l.* Three out of the four miles of railway which is to connect Clacton with the Great Eastern Line was laid with the metals, and the line was to be opened before another season. There was a large attendance at the sale, and nearly the whole of the lots were disposed of at prices varying from 150*l.* to 200*l.* each.

Ramsgate Promenade Pier.—The new promenade pier at Ramsgate was opened the other day. It is situate at the eastern end of the town. The engineer was Mr. Henry Robinson, of Westminster, and the contractors were Messrs. Head, Wrightson, & Co., of Stockton-on-Tees.

THE PETROLEUM SPRINGS OF GERMANY.

IT is some years since the probability of finding petroleum in the North of Germany was first mooted. But people were very incredulous, and pooh-poohed the idea, putting the alleged discovery down to the inventive genius of some speculator. From information now published it appears that those who believed in the existence of petroleum in Germany were right, after all, for petroleum winning has now become an accomplished fact. Our German correspondent writes to us respecting the discovery, and our readers may be glad to hear what he says.

Twenty miles from Hanover, on the Hanover and Brunswick Railway, there is situated the little town of Peine, whose name is well known also beyond the borders of the province by its industrial establishments. The quiet streets of this village-town have suddenly become full of life; each railway train brings swarms of strangers, drawn thither either by curiosity or speculation. Years ago, boring experiments were made in the Lüneburger Haide, north of Peine, with a view of tapping petroleum springs; large sums were expended, but success came not, whether from ignorance or incompetence, or from dishonest motives, cannot now be determined. Thus all confidence in the existence of profitable petroleum springs in the locality had fled, and the favourable news which last spring brought with it met with many doubters. Suddenly, a few weeks ago, an event happened which, indeed, removes all doubt, and which has caused the greatest sensation far and wide. A spring was intercepted of a yield and volume such as has not been exceeded even in Pennsylvania. Strangely enough, those results were obtained at the same spot where formerly borings, notwithstanding very heavy expenditure, were made unsuccessfully.

"Oelheim,"—Oil Home or Ham; such is the name of the new colony,—is situate about six miles north of Peine, midway between the Hanover and Brunswick and Berlin and Lehrte Railways. A good road, most of the way macadamised, like all public German roads, and, like them, shaded by fruit or ornamental trees, leads there from Peine. At first we have to the right and to the left splendid cornfields waiting for the reaper, and green meadows; the soil is fertile, and nothing indicates to the traveller that he is on the margin of the Lüneburger Haide, that large moorland of Hanover. Suddenly the picture changes. We behold dry sand soil, the only flower on which is a heather, the red Erica; trees are scarce, here and there small clumps of firs, or single juniper trees. On turning a bend of the road, we reach one of those long-stretching hills which cross the country like waves, and see a large conglomeration of wooden buildings before us. Iron towers rise in the air; by the side of them are wooden pyramids, also low sheds with iron chimneys, from which black smoke ascends; and, finally, small wooden houses, containing offices, living-rooms, and taverns. This is Oelheim, the much-talked of Petroleum Dorado of Germany. If we enter the principal thoroughfare,—we could not by any stretching of the meaning of the term call it a street,—we have on the left the towers and pumping works of the Deutsche Petroleum-Bohrgesellschaft (which has its seat at Bremen); on the right, the establishment of a private undertaking, that of Herr A. M. Mohr. Both dertaking, that of Herr A. M. Mohr. Both undertakings are close together, and are confined to a very small area, while at a greater distance we see the boring and pumping towers of other companies and single proprietors. The life and the traffic are the same as in other large industrial establishments.

The borings were at first carried on after the American system. Iron towers of a height of 75 ft. were erected, rope boring with so-called slide-cheeks being employed. This mode of procedure has hitherto not answered, and boring from wooden towers 56 ft. high by means of rods and Fabian's instrument was resorted to. The bore-holes were then lined with pipes, at first of wrought-iron; but now pipes of riveted sheet-iron one-fifth of an inch thick are used, of a diameter of 16 in., decreasing at a depth of 216 ft. to 8½ in. The borings have disclosed the following geological formation. Down to a depth of 33 ft., fine sand, mixed with erratic blocks, was met with; then came 23 ft. of bluish-grey clay, and 10 ft. of blue clay with limestone layers. From 66 ft. down to a depth of 115 ft., argillaceous marl was found; 16 ft. of rock was next encountered, and finally 26 ft. of hard sandstone rock, when the first traces of oil showed themselves. From 157 ft. down to 177 ft., considerable quantities of petroleum were present in a formation of sandy clay. Descending still deeper, the strata vary very much at the different borings, but porous sandstone, black and brown sand, and especially a layer of gravel, are principally met with, which latter is very rich in oil.

Operations are carried on at present, or will be carried on shortly, by (1) the Deutsche Petroleum-Bohrgesellschaft; (2) Herr A. M. Mohr; (3) Herr Kleissen, a civil engineer of Bremen; (4) Herr Arnemann, of Hamburg; (5) an English company; (6) a new German company, under the management of Herr Wrede, a distiller of Peine. The two latter companies are at present forming, but intend commencing boring operations at once. Herr Arnemann has commenced a bore-hole, while Herr Kleissen has been working for some time; the latter has bored four holes, of which two are not yet completed, one is pumping oil, and the fourth is lying idle. The Deutsche Petroleum-Bohrgesellschaft has driven twenty boreholes; eight of these are pumping petroleum, five are being driven, and seven may be looked upon as failures, in other words, useless for extracting petroleum. Of especial interest are the operations carried on by Herr Mohr, because in his plot the rich spring mentioned above was met with, the yield of which caused a veritable "petroleum fever" at the Bremen Exchange. Herr Mohr has driven four bore-holes. No. 1 has a depth of 295 ft., No. 2 of 230 ft., No. 3 of 226 ft., and No. 4 of 223 ft. The so-called "spring-well" was intercepted in No. 3 boring. The depth of the pump there is 180 ft.; its diameter is 2·36 in., its stroke 35 in. Its name of "Springquelle" originated in the fact that, at the spring being just struck, the subterranean gases exerted such a pressure as to force the petroleum out of the pipe in a thick jet. The force of the gas is still powerful enough to send the oil above the pump-chamber. With a speed of sixty strokes per minute, the pump raises within the twenty-four hours the astonishing quantity of 20,000 imperial gallons of the liquid. The latter consists of one-third of brine and two-thirds of oil. The oil yields, after refining, 45 per cent. of pure, very light-coloured petroleum, stated to be of better quality than the American standard oil, and 50 per cent. of fine lubricating oil, several times the value of petroleum; 5 per cent. are lost in refining. In order to estimate the extraordinary value of this spring, it should be mentioned that the other bore-holes sent forth a liquid yielding only 2 to 3 per cent. of oil, and that even with this small percentage operations are stated to pay very well. While in the case of the latter the liquid appears grey or yellowish brown, and is to a certain extent transparent, Mohr's spring No. 3 displays a dense opaque stream of yellow ochre colour. Numerous bubbles betray the heavy gases escaping with the brine and oil. The liquid flows in a jet of the thickness of an arm in a large iron basin, having a small hole at the bottom. Through this the water escapes, while the lighter oil floats on the top, and is drawn off into another reservoir. Separated from the water, the oil assumes a lustrous dark-green colour, and requires, in order to be separated from stray earthy matter, to be conducted to a third basin, whence it is pumped by hand direct into barrels. The outflow from this spring has hitherto been so heavy that the lucky owner has had to stop pumping at the other boreholes,—which, however, flowed just as copiously as before,—because sufficient barrels could not be made quickly enough for holding the oil.

Up to the present time, the oil obtained had to be sent to Hämelingen, near Bremen, to be refined. A refinery will shortly be opened at Peine, erected by the Deutsche Petroleum-Bohrgesellschaft, the oil being transmitted in iron pipes direct from Oelheim.

Thus far our correspondent. It is impossible to say how far the sanguine hopes which have been raised in connexion with those young undertakings will be realised. It ought to be known, however, that the former hap-hazard experiments have been abandoned, and that the works are now carried on in a rational manner in the new oil district. The discovery has caused the greatest sensation all over Germany. It is already predicted that in the future the latter will be able not only to provide for her own wants from the Hanover springs, but also to export a good deal of petroleum. Germany has always been a very large importer of the

oil from America, and the importance of the discovery of these springs is evident. The companies of Pennsylvania will no longer be able to monopolise the market for this article, sending up prices at their will.

As on all similar occasions, speculation in this article will soon be rampant. Petroleum companies engering is only just beginning in Germany, but it is impossible to say to what length it may go.

MONUMENTAL BRASSES.

Amongst the several classes of sepulchral effigies which form such noticeable features in our English churches, perhaps none have such peculiar interest as the monumental brass. This is especially the case because this class of memorial is now almost exclusively confined to England, the fine examples which existed on the Continent having nearly all fallen victims to fanatics and revolutionists. Having taken great interest in these records of Mediæval art, and possessing a fine collection of "rubbings" obtained from various parts of England, I venture to think that a paper on the subject will not be without its interest to readers of the BUILDER.

It will be best to divide the subject into two main classes, giving (1) some account of the art of brass engraving during the Middle Ages; and (2) a description of some of the more typical specimens remaining in this country.

As the art was known on the Continent a long time before it was introduced into England, so also when English artists turned their attention to brass engraving, they used exclusively the "latten" or "laton" plate, brought from Flanders, and taking its name, most probably, from Cedalonia or Calabria. This importation of brass plate continued for a long time, the earliest notice of its being made in England being a patent granted 1565 by Queen Elizabeth to Wm. Humfrey, assay master of the Mint. However, although the raw material originally came from Flanders, but comparatively few examples of Flemish brasses are to be found in this country, nearly all being the work of English artists. The few that were engraved in Flanders and afterwards sent over, are elaborate in the extreme, and generally consist of a square plate, the figure being only divided from its surroundings of canopy, inscription, &c., by a diaper pattern, and not executed on a separate piece of latten, as is the case in nearly all English brasses. The finest and best known Flemish examples are to be found at St. Alban's Cathedral, 1360; St. Margaret's, Lynn, 1349, 1364; North Mimms, Herts, 1360; Elsing, Norfolk, 1347; Wensley, Yorkshire, 1360;* Newark, Notts., 1361; and elsewhere. As is seen by the few examples quoted, they are chiefly of the fourteenth century. That at St. Alban's is an unusually fine specimen, commemorating Thos. de la Mare, abbot, and measuring 9 ft. 3 in. by 4 ft. 3 in.; the whole of this large surface being engraved. This abbot is in full pontificals, with mitre, staff, &c., the hands being crossed at the wrists. The canopy and super-canopy are extremely rich, exhibiting figures of St. Peter, St. Paul, Offa, king of Mercia, &c. The two Lynn brasses are almost as fine, one being to the memory of Adam de Walsoken and his wife, and the other to Robt. Braunche and his two wives, the three figures being nearly of lifesize. This latter has at the base a fine representation of the "Peacock feast" given to Edward III. when on a visit to Lynn.

The best brasses produced in England were, most probably, the work of one or two guilds of engravers. The only examples which bear any guild or artist's mark that I am aware of exist at Westley Waterless, Cambs., 1325 (the letter N reversed, with a mallet), and Trotton, Sussex, 1419 (the N alone), on the splendid brass of Lord Camoys and lady. These guilds seem chiefly to have been settled in London, though in the fifteenth century there were many brass engravers in the art-loving city of Norwich, being, as it was, the chief town of a district which has produced some of the noblest specimens of Mediæval work. Certain peculiarities seem to indicate the former existence of local guilds, as are shown in various brasses in the counties of Northampton, Warwick, and Suffolk.

There are no brasses now remaining in England of earlier date than the thirteenth century, and they are of very rare occurrence; by far the greater number belong to the fifteenth century, and are to be met with in the eastern counties, especially in Norfolk and Suffolk. The earliest example is at Stoke d'Abernon, Surrey, 1277, and commemorates Sir John d'Abernoun, showing his figure protected by the chain mail of the period, the feet resting on a lion, and the left arm bearing a shield with the arms of the deceased, viz., *az.* a chevron *or*. Another brass of this period is the celebrated one to Sir Roger de Trumpington, in the church of Trumpington, near Cambridge, dating from 1289,—a valuable example of the costume of a Crusader. There is also a very curious little brass, a demi-figure to Sir Roger de Baslingthorpe, in the Lincolnshire church of that name, dating from 1290. This scarcity of early brasses shows how highly they were esteemed when first introduced into England, as their costliness prohibited their general use.

The earliest Continental brass remaining is, I believe, to be seen in the Church of St. Andrew at Verden. It is to the memory of Bishop Yso von Welpe, 1231, representing him, as is usual for bishops, in pontificals. There is also a very fine specimen in the Cathedral of Hildesheim to Bishop Otho de Brunswick, 1279. But beyond these, and a few still existing at Lubeck, Schwerin, Bruges, and Ghent, the Continental churches are practically destitute of these memorials.

As was said before, the practice of engraving a whole plate, dividing the figure from the architectural adornments by diapers, &c., was not followed in England till the middle of the sixteenth century, when we find many small brasses engraved on a square plate, giving, perhaps, a group of figures above, with a long inscription below. This form continued, then, till the art of brass-engraving died out, is common with many other crafts, in the tasteless period of the last century. Brasses of foreign workmanship are, however, easily distinguished from the late English examples by the character and purity of their details.

During the fourteenth and fifteenth centuries the highest resources of the designer's and engraver's art were lavished on monumental brasses, those of the nobility being enriched with their arms, badges, rebuses, &c., while the citizens and merchants were distinguished by their respective tokens and "marks." The brass of Lady Camoys, at Trotton, 1310, was originally powdered over with stars and coronets; that to Sir John Say and his wife Elizabeth, 1473, at Broxbourne, Herts, still retains the enamelling of the arms on the tabard and kirtle, while the beautiful memorial to Laurence de S. Maur, rector, 1337, at Higham Ferrers, Northants, is a very fine specimen of a brass with a canopy and super-canopy, both these adjuncts being adorned with figures of saints with their proper emblems. Brasses may always be taken as faithful representations of the costume of the period, as is manifest by comparing them with any contemporary portrait or painting, and it seems almost certain that in many cases the identical patterns on the dresses of ladies and collarets of knights were copied exactly. It is curious, however, that the artists who designed the brass were careful to avoid depicting the extreme fashions prevalent at the time.

It will now be the place to notice some of the more interesting examples of brasses remaining in England, classing them under the heads of ecclesiastical, military, civil, and miscellaneous, giving also some instances of curious inscriptions.

Brasses of Ecclesiastics.—The majority of brasses before the Reformation represent ecclesiastics habited in eucharistic vestments, the alb, stole, chasuble, and maniple. Bishops are depicted in tunicle and dalmatic, with mitre and staff, the chasuble, &c., being also their principal vestments. Archbishops carry a crosier. There are also many examples of ecclesiastics habited in the cope, a vestment more especially used for processions and for functions other than sacramental. The earliest example of a brass to the memory of a priest existed some years ago in the church of Oulton, Suffolk, but, shameful to narrate, was stolen (I believe in 1840), and has never been recovered. Its date may be fixed at 1310 (3rd Edw. II.), and it was probably a memorial to one of the Bacon family. It represented the deceased in vestments of beautiful design, the hands placed as in prayer (an attitude adopted in almost all pre-Reformation brasses), and the feet resting on a lion. Other early specimens of priest brasses remain at Chinnor, Oxon, 1320; Woodchurch, Kent, 1320 (a beautiful figure in the head of a cross); Brigton, Northants, 1340; Denham, Bucks, (now, I believe, lost), 1360; Brundish, Suffolk, 1375; and Hellesdon, Norfolk, 1389. In Hereford Cathedral is a beautiful brass to Bishop Trellick, with canopy, dating from 1360. There is a very curious brass in Horsmonden Church, Kent, to John de Grovehurst, *c.* 1340, in vestments, with a scroll in the hands inscribed with a text.* Brasses to priests have not generally a long inscription, but simply a pious wish, as "Fili dei miserere mei" engraved on the breast of the figure at Higham Ferrers, quoted before; or "Hic jacet magi—qui obiit—die Julii Añ dñi MCCCCXX cujus aie ppciet Deus Amen." This last is an inscription to be met with in almost every church where there is a brass, and seems to have been a universal form of epitaph. But scarcely any brass, whether ecclesiastical or otherwise, of the fourteenth or fifteenth century indulged in a long inscription, this being a weakness not developed till post-Reformation times, when the merits and not the shortcomings of the deceased were written for the information of posterity. One of the finest brasses to a prelate is that to Archbishop Robt. de Waldeby, 1397, in Westminster Abbey; he bears the crosier, and is in the attitude of bestowing a benediction. The following list gives some of the more interesting memorials of bishops:—Archbishop Grenefeld, 1315, York Cathedral; Archbishop Cranley, 1417, New Coll. Oxon.; Robert Wyvill, Bishop, 1375, Salisbury Cathedral (a very fine brass); Bishop Bowthe, 1478, East Horsley, Surrey; Bishop Goodrich, 1554, Ely Cathedral, &c. The pall (similar to the Greek ὠμοφόριον) is peculiar to archbishops; its shape is similar to the pall blazoned on the arms of the see of Canterbury. Abbots are represented with staffs: examples remain at Westminster, Abbot Estney, 1498 (a very beautiful memorial), and Dorchester, Oxon, 1510. Only two brasses of abbesses remain, they are to be seen at Elstow, Bedfordshire, 1530, and Denham, Buckinghamshire, 1510. Sometimes the priest is shown holding the chalice with the consecrated wafer: examples are to be seen at Higham Ferrers, 1498; Cobham, Surrey, 1510; Broxbourne, Hertfordshire, 1465; and many other places. Ecclesiastics wearing surplices only are rarely depicted, a notable exception being the splendid brass to Thomas Nelond, prior of Lewes, 1433, Cowfold, Sussex. Priests are sometimes shown wearing the almuce or amice, a kind of tippet or hood of white fur, which became altered in the fifteenth century by the addition of a cape and pendents. Good specimens of this habit are to been seen at Hackney Church, in the brass of Dr. Urswick, 1521, and at St. Cross, Winchester, in the memorial to Dr. Richard Harward, "decretorum doctor," 1493. Ecclesiastics in academicals are rarely met with in parish churches, though our two Universities have fine examples in their college chapels. In St. Benet's, Cambridge, is a very interesting brass of a doctor of divinity, habited in cassock and hood, while other similar brasses are to be seen at New Coll. Oxon., 1441, 1468, and St. Martin's Outwich, London, *c.* 1500. It would require a much more comprehensive article than this to give even a short description of the various kinds of brasses placed to the memory of ecclesiastics, and I will leave this part of the subject after a few remarks upon brasses of members of religious orders. Engraved memorials to monks are extremely rare, owing to the rules of poverty by which their order were bound; but examples are to be seen at St. Alban's Cathedral to Robert Beauner, *circa* 1470; Cowfold, Sussex (Cluniac Prior), 1433; and Halvergate, Norfolk, *circa* 1460. These memorials represent the deceased in the habit of their order. Figures of priests are sometimes placed in the head of a floriated cross, but some of these beautiful brasses will be noticed further on.

Military Brasses.—The two early military brasses at Stoke d'Abernon and Trumpington, have already been mentioned. The one or two other cross-legged effigies that remain are extremely interesting. They are the following:—Sir Robt. de Bures, 1302, Acton, Suffolk; Sir Robt. de Setvans, 1306, Chartham, Kent; Sir — Bacon, 1320, Gorleston, Suffolk; Sir — Fitzralph, 1320, Pebmarsh, Essex; and Sir Hugh Hastings, 1347, Elsing, Norfolk. Each of these beautiful memorials represents the deceased

* Since this paper was written I have heard that this fine brass has lately been stolen!

* This memorial has lately been "restored" by repolishing and refilling the incised lines with mastic; both processes possessing very doubtful advantages.

in hawberk or suit of mail, with bliaus or surcoat, sword, and shield blazoned with the family arms. The Pebmarsh and Elsing examples have a slightly different armour, being a little later in date. In the Trumpington and Chartham memorials the figures have curious ailettes or little wings edged with fringe, and sometimes charged with the arms of the wearer, as at Chartham, where these appendages bear the winnowing-fan, the arms of Setvans. It would be impossible within the limits of this paper to give an account of the changes in the form of armour during the fourteenth, fifteenth, and sixteenth centuries: so I will merely point out some of the finest examples of military brasses of these periods. At Westley Waterless, Cambs., is a very fine brass to Sir John de Creke and lady, *circa* 1325, depicting him in mail with bascinet, or pointed helmet, and camail (the portion of mail round the throat and shoulders). Rowell spurs are first seen here. In the reign of Edward III. the jupon was worn over the hawberk; it was a sleeveless garment of silk or velvet, sometimes finely embroidered with armorial bearings. At Bowers Gifford, Essex, is an early example of the jupon in the brass of Sir John Gifford, 1348; Sir Hugh Hastings, at Elsing, also wears this surcoat, broidered with the maunch of the Hastings family. The only remaining example of a military brass of the reign of Edward II. lies in the church of Minster, Isle of Sheppey. It commemorates Sir John de Northwode, and depicts him in a bascinet with enriched border, and camail of banded ring-mail. There is a chain attached to the breast for the purpose of securing the tilting-helm, and the shield is suspended by a strap so as to cover the sword. It bears the arms of Northwode, *erm.* a cross, *engr. gu.* The figure of his lady lies beside him, her head supported by a diapered cushion, and her throat surrounded by a very curious wimple. There are some splendid examples of military brasses dating from the latter end of the fourteenth century. At Aldeburgh, Yorkshire, is a fine memorial to William de Aldeburgh, *c.* 1390, showing him in bascinet and camail, with a short habergeon, and jupon enriched by a handsome embroidered bawdric or belt. The arms of Aldeburgh are blazoned in the jupon, and on the shield. At Southacre, Norfolk, is another fine specimen of this class in the memorial to Lord John Harsick and his lady, 1384. He holds his wife by the right hand, his left resting on his sword. The mail shirt is seen slightly below the jupon, which is charged with the Harsick arms,—a chief indented. Above, as an ornament, is the tilting-helmet, with the cointisse and crest,—in a hoop or a bunch of turkey feathers. In Cotman's "Brasses" is an etching of the brass of Sir Miles Stapleton, 1364, from Ingham Church, Norfolk (now lost), which is a valuable example of studded-mail or small round plates of steel secured to a lining of pourpoint. There is a figure in Harrow Church having the thighs defended by this class of armour, and also in Watton Church, Herts, 1361. At Little Casterton, Rutland, is a very beautiful brass to Sir Thomas and Lady Burton, 1382, the knight wearing bascinet, camail, and jupon, and also the collar of SS. His lady wears a most curious square netting to the hair, with a long cloak and girdle. In the magnificent memorial to Sir Robert Swynborne and his son Sir Thomas (1391 and 1412), in Little Horkesley Church, Essex, we have two kinds of armour depicted in the same work of art, the father wearing the jupon sec, and the son the newly-introduced plate armour, with skirt of taces or plates of steel, overlapping upwards and protecting the thighs. Sir Thomas wears the collar of SS. These two fine figures lie under beautiful canopies.

In Baginton Church, Warwickshire, is a most admirable brass to Sir Wm. and Lady Bagot, 1407. He wears bascinet and camail, with collar of the SS., jupon and gauntlets, with armour for the arms and legs. His arms,—a chevron between three martlets,—is broidered on the breast. Lady Bagot wears a kirtle, cotehardie, and fur-lined mantle. The armour of the knight is beautifully engraved and chased. Many splendid brasses of this period are to be met with, some adorned with magnificent canopies. There is a curious memorial at Harpham, Yorkshire, to Sir Thomas de St. Quintin, 1418, in a form of plate-armour, with a rather grotesque orle or chaplet round the bascinet. The following is a short list of fine brasses of this date:—Sir Nich. Dagworth, 1401, Blickling, Norfolk; Sir Wm. Fienlez, 1402, Hurstmonceaux, Sussex; Sir Roger Drury and lady, 1405, Rougham, Suffolk; Sir Reg. Braybrook, 1405, Cobham, Kent; Sir Thos. and Lady Marsyngherde, 1405, Gunby, Lincolnshire; Earl and Countess Beauchamp, 1406, St. Mary's, Warwick; Sir Simon Felbrigg, K.G., and lady, 1413, Felbrigg, Norfolk. Modifications of plate-armour continued in vogue for a century or more; in fact, until that mode of defence was abandoned. The figure of Walter Greene, esq., 1450, at Hayes, Middlesex, has a skirt of taces or plates, cut into the shape of escalops; likewise the effigy of a knight, *c.* 1450, Isleworth, Middlesex. There are some good instances of figures in tabards remaining in different parts of England. Sir Ralph Shelton, 1423, at Great Snoring, Norfolk, was depicted wearing one; but when I visited this church two years ago, his figure had disappeared, though I believe the brass was there a few years ago. At Childrey, Berks, the effigy of Sir Wm. Fynderne, 1444, wears a tabard with the arms,—a chevron between three cross crosslets *fitché*. The sons of John Ansty, esq., 1465, in his interesting brass at Quy, Cambs., are shown habited in tabards.

At the beginning of the sixteenth century the armour became degenerate in shape, many of its details being absurdly exaggerated, as in the case of the elbow-pieces. At Assington, Suffolk, is the figure of a knight, *c.* 1500, clad in armour composed chiefly of overlapping plates. He wears long flowing hair, and the sword is slung immediately in front of him. The effigy of Sir Humphrey Stanley, 1505, at Westminster Abbey, is a good example of late armour. One of the very late forms is to be seen at Wrentham, Suffolk, 1593, in the brass to Sir Humphrey Brewster; his ruff shows above the steel gorget. We find military brasses of the seventeenth century, but they are always of little artistic interest, though of value as examples of armour. At Wrotham, Kent, there is a memorial to Wm. Clerke, esq., 1611; at Margate, Kent, one to — Cley broke, esq., 1600; St. Columb, Cornwall, John Arundel, esq., 1633, &c.

Brasses of Civilians.—These are less frequently met with than those of ecclesiastics or knights, though some are of great interest. I shall include brasses of ladies under this head. The earliest existing example is the very elegant memorial to Margaret Lady de Camoys, 1310, at Trotton, Sussex. She is habited simply in a long robe or dress with loose sleeves, while the tight sleeves of an under-tunic appear reaching to the wrists. The head is covered by a coverchef or handkerchief. About 1340 the figure had nine shields of arms "powdered" over the outer tunic, but these are now gone. Ten years later than this is the very beautiful brass to Joan de Cobham, in the church of that name, Kent. She is habited in an almost similar garb, her figure lying under a fine canopy with small shafts and pinnacles. At Taplow, Bucks, is an extremely beautiful brass to Nicholas Aumberdene, 1350, the effigy being placed in the head of a floriated cross. The costume is that usually worn in the reign of Edward III. We have another even more beautiful example at Hildersham, Cambridgeshire, 1379, where the figures of Robert de Paris and his wife kneel on either side of a floriated cross, in the head of which the Most Holy Trinity is represented. At King's Sombourne, Hants, is also a curious figure of a civilian, *c.* 1380. But it will be best just to point out some of the most interesting features to be met with in brasses of civilians of all classes. Merchants are often distinguished by the marks of their respective "staples,"—many examples are to be seen in the Norwich churches. Notaries are shown with their ink-horn and pen case,—good specimens exist in St. Mary's Tower, Ipswich, 1475, and at the New College, Oxford. During the fifteenth century civilians are frequently represented with a gypcière or scrip, and sometimes with a dagger. Brasses of figures in shrouds are also common, emaciated figures being occasionally depicted, as at Salle, Norfolk. In late brasses the children are shown kneeling below,—the sons below the father and the daughters below the mother, their figures being much smaller, and generally having a very grotesque appearance. In Elizabethan examples the children are nearly always shown. Having thus slightly pointed out a few characteristics of brasses of civilians, a few remarks on miscellaneous brasses will be of interest. Under this head the cross brasses take a prominent position. These beautiful memorials sometimes have figures either in the head or at the side, or are without these adjuncts. Of the former class, the following examples may be given:—To John Lumbarde, rector, 1408, Stone, Kent; Buxted, Sussex, 1408; Taplow, Bucks, 1350, &c. Of the latter,—to Thos. Chichele and wife, 1400, Higham Ferrers, Northants; to Roger Cheyne, Esq., 1415, Cassington, Oxon; and at Broadwater, Sussex, 1415; St. Mary's, Reading, 1416; Beddington, Surrey, 1425, &c. At Upper Hardres, Kent, 1405, is a figure kneeling beside a shaft supporting a basket, on which are the figures of SS. Peter and Paul. Sometimes a brass consisted simply of a chalice and host, with inscription, as at Baurburgh, Norfolk, and elsewhere; sometimes of a heart, with scrolls and inscription, as at Trunch, Norfolk, and elsewhere; sometimes a coat-of-arms, and often an inscription only. In very late examples skeletons, hour-glasses, and other emblems of mortality are depicted. I must not omit to notice the very peculiar little brass to Wm. Complyn and his wife, 1498, at Weeke, Hants; it consists of an inscription and a figure of St. Christopher carrying the Infant Christ over the river, as runs the legend. Occasionally we find that not over-scrupulous persons have made use of a brass of a predecessor for themselves, reversing the plate and engraving it afresh on the other side; such examples are called "palimpsest" brasses, and may be seen at Cobham, Surrey, 1510 and 1550; Hedgerley, Bucks, 1530 and 1540; St. John, Maddermarket, Norwich, 1440 and 1540, and elsewhere.

Inscriptions.—In early times these were generally of a simple description, beginning with "Orate pro anima," with the name and date, generally ending with, "Cujus anime ppcietur Deus." When English inscriptions became common, they began with "Of your charite praye for the soule of." The early inscriptions were always of a pious and solemn nature, the greatest ecclesiastics being content with a prayer or a quotation from the Scriptures. The Norman-French ones were after this sort:—"Gist ycy Dieu de sa alme eit mercy Ame." At Mere, Wilts, 1398, is the following:—

"Quisquis eris qui transieris, sta, perlege, plora,
Sum quod eris, fueram quo quod es, pro me ppr or ora."

Job xix. 25–27, is sometimes quoted beginning "Credo quod redemptor meus vivit," &c. The earliest English inscription is, I believe, at Newark, beginning "Man com and se how schal all dede be," dating from 1370. A sort of litany is occasionally used, as "Sancta Trinitas unus Deus miserere nobis, Pater de celis Deus miserere nobis," &c. Often they are very terse, as "Jesu mercy," "Lady helpe," or simply "Jesu misere." In later times they became long, and were generally devoid of devotion, and sometimes quaint and humorous in the extreme, with puns on the name of the deceased, with verses, &c.

In concluding this article on monumental brasses, I cannot refrain from alluding to the constant disappearance of whole or part of these most interesting memorials from parish churches. It is almost impossible to visit many churches where such monuments are known to have existed without finding that within late years some have disappeared, never to return again to the sacred precincts where they have lain perhaps for generations. I myself have visited churches at an interval of two or three years, and found on the second visit the whole or some portion of a brass wanting. This is either the result of great carelessness or want of appreciation for the works of our pious ancestors, and often, I fear, through the theft of workmen and others at "restorations." My earnest wish is that these interesting relics of a bygone age may for the future receive the respect due to the monuments of illustrious dead.

ARTHUR G. HILL, B.A.

Working of the Employers' Liability Act.—An important decision under the Employers' Liability Act was given at the Bradford County Court by Mr. Daniel, Q.C., on the 26th ult. A man named Whittaker sued the executors of J. Balmforth, ironfounder, Rodley, near Leeds, for damages for injuries owing to the defendants' negligence. Some time ago a piece of cast iron fell on the plaintiff's foot whilst working at a drilling-machine through the breaking of an eye-bolt which had a defect. The defendants denied knowledge of the defect. The judge held that the defendants were guilty of negligence, and gave judgment for the plaintiff, awarding 156*l.* damages,—three years' wages at 1*l.* per week, the largest amount allowed by the Act.

DOMESTIC ELECTRIC LIGHTING.

AMPLE evidence has been afforded to the inhabitants and daily visitors of the metropolis proper that the illumination of streets, public buildings, and even private dwelling-houses by means of electricity is an accomplished fact. Those who have gone regularly to the City have observed the gradual growth of the numerous systems now employed to take the place of gas as a means of illuminating some of the greatest and most important thoroughfares. Massive iron pillars of different designs have been erected in various positions, and the familiar lamp-post has, *pour le temps*, been completely eclipsed by its more gigantic and imposing brethren. Lamps of large size and curious shapes have been placed on the summit of these supports, and the light produced by the generation and transmission of powerful electric currents has far excelled the ancient coal gas, with whose feeble glimmer we have been content for so long. These trials, as well as the numerous others, viz., the illumination of the Thames Embankment, the various stations on the Metropolitan Railway, the Houses of Parliament, and other buildings and places, although serving in a great measure as experiments, nevertheless point out the practicability of the scheme, and exhibit the numerous advantages which would arise from its adoption for many purposes to which it has yet to be carefully applied. The rise and progress of the electric light may be conveniently compared with the life of its neighbour, the telephone. A few years back, and this latter existed merely as an idea, a scientific experiment. Now we find it recognised as a part of the business, and frequently domestic, outfit. It has become a popular and useful addition to every section, and there is no doubt but that in a few years it will be regarded as an absolute necessity by every one. And so with the electric light. Born in the laboratory, it remained for a lengthened period catalogued with a numerous army of similes, and was classed with them as a mere experiment suitable for display on exceptional occasions only. But with the progress of time came the development of electric light. Attention was drawn to the economics of the subject, and soon improvement upon improvement arose, one after another levelling the path, and overturning one by one the manifold obstacles which had before obstructed it. And there are few, we think, if any, who, seeing these brilliant displays, have gone away with the conviction that the extremities of the subject have been reached, or that there is no further room for development. On the contrary, the subject is but in embryo yet, though daily advancing; and there is little doubt that ere long it will no longer be confined to our great cities and mighty highways, but will find its way into our suburban dwellings and our smaller and more modest thoroughfares. Every one knows, only too well, in many cases, the various unpleasantnesses arising from a use of gas. It heats our rooms to a tropical temperature; it is glaring and tiring to the eyes; it blackens our ceilings and our wall-papers; it eats into our pictures, our books, and our curtains; and, finally, it empties our pockets a good deal more than many of us can afford. It is, however, such a necessity that we cannot do without it, in some form or other. "Comparisons are odious," we are told, but putting electric lighting by the side of gas illumination, the most sceptically-inclined individual must confess the former has a distinct advantage over the latter. First of all, the light is pure white, pleasant to the eyes, possessing no hurtful heating qualities, so that rooms in which it is used are rendered cool and comfortable; it is perfectly harmless and non-injurious to any article of furniture, dress, or art. And then, as regards the economy of the question, as the electric light far surpasses gas-light with respect to brilliancy of illuminating power, it stands to reason that less light would be required than when gas was employed. One electric globe in a room would dispense with half a dozen flaring gas-jets. Another question allied to this point is the fact that one cannot be troubled and annoyed by escapes as in the case of gas, which, owing to the prevalence of cheap and scamped plumbing, are of frequent occurrence. Householders will appreciate this fact fully, we think, for there are many who could point out in their gas account a remarkably large quantity consumed, of which they never experienced the slightest benefit, for the simple reason that during their absence from home for a time some thousands of cubic feet were wasted on the "desert air" through a villanous rent in a pipe. With electricity such contingencies are impossible. Electricity is a fluid, invisible, tasteless, without smell, and undetectable except by special methods. No such accidents as explosions or suffocations, resulting from a tap omitted to be closed, or a hole in a pipe, can take place when electricity is employed. A clean house and a bright, cool, and harmless light are desiderata by no means to be despised: they are necessary to this age of labour-saving appliances and simplification of methods, and so we may look for an accomplishment of our hopes and conjectures in a period not far hence.

The telephone promises to invade the domiciles of our private life, the electric light as a natural consequence will follow, and when once introduced the rest is easily foretold. With a brilliant light on our roadways and a bright glow in our houses we should then understand and appreciate more fully the benefits arising from the use of electricity, and acknowledge its supremacy over our old but cumbrous friend, gas. The electric currents could be generated in central stations conveniently situated and connected with the various houses in the district by subterranean cables. During the daytime when the light was not required the electricity could be made to do useful work in other directions. By means of suitable motors we could work the domestic sewing-machine, or roasting jack, knife-cleaner, sausage-machine, and other household apparatus. Passing the current through platinum or other metal of similar nature arranged in copper tubes we could obtain an amount of heat sufficient for many culinary operations, besides warming our rooms in the winter. In fact, there is no limitation to the uses to which electricity may be applied, and a little thought will soon suggest a round dozen or so. Electricity is such a simple agent to handle that it will unquestionably fill a vacant place in the household, and as soon as its special qualifications become more generally known, will, without doubt, become of such importance as to be wholly indispensable.

A. J. D.

THE WOOD INDUSTRY OF CHINA AND JAPAN.

THIS subject was the theme of a lecture recently delivered by Professor Exner in the Oriental Museum of Vienna. The lecturer described the East, as in many other respects, so also in the matter of the wood industry, as the teacher of the West. He based this assertion on the present use of wood, and although the lecture had special reference to the wood industry of China and Japan, it might have been expected that Professor Exner would have cited some people of ancient times who made a name not only in the wood industry generally, but also in wood-carving. It is well known, for instance, that the Phœnicians carried on an active trade in timber and dye-woods, and that the wood industry and wood-carving of this people produced works of art which, if preserved, would have served as excellent specimens of *chefs-d'œuvre* for our art museums. It should be pointed out here that the wood trade in ancient times was very lucrative, and that the wealth of the Phœnicians created such an amount of envy amongst their neighbours as to cause them to lose their independence within a surprisingly short period. Shipbuilding in the East in former times was entirely overlooked by the lecturer in his paper, but probably he had the intention of merely treating of the present. Moreover, the peoples of the civilised States of Europe of the present day formerly employed wood for a great many objects which are now made of metal, glass, &c. It is only in the half-civilised parts of Russia that articles made of wood are still extensively used in preference to those of other materials, though the former are rapidly disappearing before their more formidable rivals.

The lecturer by no means succeeded in what he attempted to prove, namely, that China and Japan are countries which are far in advance of us in the use of wood, and whose example we ought to follow. It is most certainly a sign of progress that we have discarded the wooden plough, and that we now make hundreds of objects of glass, china, or metal, instead of wood. Professor Exner likewise advocated in his lecture the importation of Japanese woods, resting his case on the peculiar properties of certain descriptions. We need hardly point out that the question of cost of freight is one which plays a very important part in our import trade, and that Europe is able to draw its supplies of wood from sources much nearer home. Professor Exner explained the various properties of Japanese woods, dividing them into four principal groups, namely:—*Pauluvia japonica*, *Pictumeria japonica*, *Plavna japonica*, and *Pseudolarix* (*Coniferæ*), and comparing them with those grown at home. The wood of *Pauluvia japonica*, described as the "wood of woods," occupies the chief place. In the case of *Pictumeria* we have five different forms with distinctly-marked characteristics of the sap-wood (*suchi*) and heart-wood (*acam*) with regard to colour. *Plavna* is distinguished by greater hardness from the former woods, shrinks quickly, is aromatic, and especially suitable for turning. *Pseudolarix* reminds us of the white beech and black fir.

As we have repeatedly remarked on former occasions, although the uses which the peoples of China and Japan make of the stores of wood placed by nature at their disposal are most multifarious, and excite deserved admiration, its varied application by them does not prove that they are ahead of us in its employment. Their technical skill in manufacturing wood into articles of every-day use is very remarkable, but it does not surpass that of Western nations in working far less pliable materials into useful forms. The heavy cost of freight will be a perpetual bar to unmanufactured wood from those quarters of the globe being imported into Europe in any considerable quantities, and thus one of the chief conclusions of Professor Exner's lecture falls to the ground.

THE BISHOP'S FIELD, LAMBETH PALACE.

GREAT praise is due to his Grace the Archbishop of Canterbury for having, even for one day, opened to the crowded population of Lambeth the large unoccupied space of land adjoining Lambeth Palace, known as the Bishop's Field. The rare opportunity was seized with avidity by the thousands of children in the neighbourhood who literally swarmed all Monday in last week into and over the Archbishop's paddock, from which its daily peaceful occupants, a few sheep and some horses, had been temporarily turned into their rustic house, which occupies one corner of the enclosure.

The field, to the general public a *terra incognita*, hidden behind the grim wall in the Lambeth-road, and scarcely known even to those guests of the Archbishop who may have been fortunate enough to be invited to some open-air party in the quiet garden of Lambeth Palace, with its beautiful lawn, old trees, flocks of birds, and quaint Old English seat,—is perhaps the only piece of unoccupied ground still left in Lambeth, where open spaces are so sadly wanted. It seems almost obvious that the "Bishop's Field" should be converted into a public recreation-ground. Objection, undoubtedly, might be raised by the Archbishop, but, desirous as he has ever shown himself to benefit the poor, such a scene as that of last Monday week may have suggested to him how sadly wanted is some open space for the little ones of the crowded district in which the London residence of the Archbishop of Canterbury has for so many centuries been situated. Were it not to some extent violating the strict rules of hospitality, it might be hinted that the Bishop's Field is not kept with that absolute regard to tidiness,—even perhaps to sanitary requirements, a large mud-shored horse-pond, and by no means cleanly cow-house, occupy conspicuous places,—that one would expect to find in a place only separated from the Primate's well-kept gardens by a low-crumbling picturesque red-brick wall.

In competent and experienced hands, wonders might be done with the small yet sufficient acreage of the Bishop's Field, and now that so wholesome an agitation is going on in favour of green spaces in our crowded centres, we could imagine no spot more worthy the attention of those in influential quarters. By judicious management and due consideration it might be made beautiful. With the gray historic walls of Lambeth, the Lollards' tower, and all its memories, the old trees of the Palace garden, the not unpicturesque skyline of St. Thomas's Hospital, the peep of the Thames, and the grand outline of Barry's Houses of Parliament to form the natural features, and the aids which cultivation and art place at the disposition of the landscape-gardener in the present day, the

"capabilities" are great for making the "Bishop's Field" not alone a playground and a breathing-space for the crowded district of Lambeth, but an adornment to the metropolis. The scene presented by the Bishop's Field on the Monday in question was more than sufficiently suggestive of the urgent need of some public open green space in brick-bounded Lambeth.

THE NATIONAL PORTRAIT GALLERY.

A NEW and enlarged edition of the historical and descriptive catalogue of the pictures and busts in the National Portrait Gallery, South Kensington, by Mr. George Scharf, F.S.A., has just now been published, and should have the effect of sending an increased number of visitors to this valuable and delightful collection. It includes an historical sketch of the origin and growth of the Gallery, and various lists to show readily what the Gallery contains. In the preparation of the biographical and descriptive notices, which form the body of the work, Mr. Scharf has brought his special knowledge and accomplishments to bear, and has produced a volume equally instructive and entertaining. So good a shilling's worth of reading, quite irrespective of any opportunity to visit the Gallery (450 pages of it), we can scarcely point to.

We may usefully mention that the collection is open, *free*, any day but Friday, from ten to six in summer and ten to four in winter. The visitors last year appear to have averaged nearly 1,500 per week.

COMING MEETINGS ABROAD.

Astronomical Congress, Strasburg.—Various scientific and learned men of Europe have been invited to meet in a congress which is to assemble at Strasburg in the month of September. In the event of this meeting taking place the result is expected to be a brilliant one, as the observatory of that city is provided with one of the best optical apparatus known. The variety of themes for scientific observations are also said to be of no small interest to the astronomical science. The astronomical phenomena which of late have made frequent appearances, and engaged the attention of scientific men of the universe, will, no doubt, be also subjects for discussion.

International Exhibition, Vienna.—We announced this exhibition in one of our past numbers, and from the farther particulars since received from abroad it is to be gathered that the exhibition is intended to represent the works of art confined to the period which has intervened between the last Vienna Exhibition, 1873, and the present date, and that most active preparations are going on for the promotion of this exhibition. It will consist of architecture, sculpture, drawing, design, engraving, and other congenial arts. The exhibition, which will commence in April, will continue to September, 1882. The managing committee is endeavouring to see that all the nations send their share of the exhibits.

International Phylloxeric Congress, Bordeaux.—The Bordeaux Chamber of Commerce, as well as that of Gironde, together with the municipal bodies of both those cities, and the agricultural and horticultural societies of the latter, having resolved to hold an International Phyloxeric Congress, the committee, composed of the respective bodies appointed for making the necessary preparatory arrangements, announces that the same will assemble at Bordeaux, on account of this city being the centre of the wine-growing districts of France, and that the said congress will have a threefold purpose, viz., (1) to discuss and resolve upon the best means of averting the plague, which is said to be on the increase, even after destroying more than 3,000,000 of hectares of the vineyards of France; (2) to generalise the results obtained in various applications of preventives, and the partial remedies discovered to preserve the plants from attacks, and which are not generally known to the men interested in wine cultivation; and (3) to investigate the possibility, by means of certain measures, including financial ones, of bringing about the reconstitution of the vineyards; and as this object cannot be attained but by the testimony of the scientific men, and without the knowledge of results of experiments made in recent years in France and other countries, the committee appeals to vine-growers, and requests the attendance of the men of science of all nations to favour them with their experience and knowledge for the solution of a problem of so important and general interest. The meeting will commence on the 5th September next.

EXTENSIONS AT THE WIMBLEDON RAILWAY STATION.

NEW MAIN-LINE OFFICES.

THE London and South-Western Railway Company are very considerably enlarging their Wimbledon Station, with the intention more especially of providing greatly increased accommodation for the main-line traffic. The extensions in progress are on the west side, and when the works are completed the station area will be increased to almost double its present extent. Immediately to the west of the up-main-line, a new block of buildings is in course of erection, containing in the centre large and convenient booking-offices, 40 ft. by 20 ft., whilst at the south end of the block there are three commodious ladies' waiting-rooms, for first, second, and third class passengers respectively; and at the north end a spacious general waiting-room, 30 ft. square. The booking-offices and waiting-rooms will be approached on the extreme west side under a covered roof. A new platform, 500 ft. in length and 20 ft. in width, with an asphalte surface, has been constructed, running parallel with the up main-line, a portion of the platform, to the extent of 200 ft. in length, being covered in with an arched-roof of corrugated iron, supported on columns and ornamental iron brackets. What has hitherto been a large open space, immediately on the east side of the down main line, situated between that line and the several suburban or branch lines, has also been utilised for the purposes of the enlarged station. On a portion of this hitherto open area, which is about 40 ft. in width, new offices and waiting-rooms have likewise been erected, and the entire width, to the extent of 200 ft. in length, covered in with a corrugated iron roof, uniform with that on the up-line side of the station; whilst a new platform for the down-line traffic, 500 ft. in length, has also been constructed. Access will be had to the enlarged station by the extension of the existing footbridge over the railway, and two new staircases leading down to the several platforms. The new footbridge has a span of 56 ft., and is carried to the extreme west side of the up-line new platform. It may be added that the whole length of the footbridge over the several lines of rails, from the street approach on the east side of the station, to the west side, is about to be roofed over, and the upper portion of the sides of the bridge will be filled in with glass. When the works now in progress are completed the main-line platforms on the up and down side will each be upwards of 1,000 ft. in length. We understand that the intention of the directors ultimately is to reconstruct the existing old station buildings.

Messrs. Perry & Co., of the Tredegar Works, Bow, are the contractors for the works, which are being carried out under the superintendence of Mr. Medcalfe, one of the company's engineers.

FROM ABROAD.

Trojan Antiquities.—The German press has lately called attention to the fact that Dr. Schliemann has (with the assistance of four officials from the Royal Gallery) arranged the articles found by him during his excavations, in the new Art Museum at Berlin. They are mostly in glass cases (similar to those at the South Kensington Museum), being duly classified and labelled. The golden relics of Trojan grandeur will have a case which is being made with a special view to their security. The collection will then be open to public inspection, under Dr. Schliemann's supervision.

Block Houses.—The Swedish block-houses referred to in our issue of the 27th of August cost 60*l.* each to make, and the freight to Sassnitz was about 8*l.* per house. The total cost of each of them, including erection, with foundation, verandahs, three coats of varnish inside and outside, besides painting the roof, was 135*l.*

Dangers of Lighthouse Building.—The steamer *Nordvakten* lately brought to Stockholm, twenty-two workmen, who had been engaged in laying the foundations of a lighthouse on the Bogskaer, a naked rock in the southern part of the Aland islands, which is, in calm weather, only 15 ft. above the surface of the waves. A sudden and violent storm had sprung up, and in a short time swept away their boats, building materials, and food. After three days' sojourn on the rock, without food or drink, they were fortunately observed, and rescued by the above steamer from their perilous situation.

An Underground Railway is projected for Naples. The plans are already before the municipal council, and will be discussed in detail very shortly. The persons undertaking the work are ready to bear the cost of the construction and the expenses of working the line. It will begin at the Grotto of Posilippo, and will be brought under the Vomero, the Strada di Chiaja, and some other streets terminating at a point near the sea.

A Monumental Bridge is about to be built at Bremen, which will connect the Bürger Park with the wood of the same name. The excavations for the foundations are now being proceeded with. It will be at a high elevation, and will have a roadway over 30 ft. in width, on account of the large converging traffic which is expected in each direction. The ground in the immediate neighbourhood will be raised, and the necessary earth will be obtained from the excavations to be made in connexion with a water-reservoir. The work will occupy from two to three years.

THE FEMALE PREVENTIVE INSTITUTION.

ON the 24th ult. Sir William Rose, K.C.B., Clerk to the House of Lords, laid the foundation-stone of the new chapel and other buildings now being erected in the rear of the Central Home, Euston-road. Mr. Charles Burton, on behalf of the committee, read an address, setting forth that having secured the freehold, justified them in making every possible improvement for the inmates which the space would allow. The committee had had certain difficulties to surmount with respect to light and ventilation, and in both it is fairly anticipated that the result of the exertions of Mr. E. W. Thomas, the secretary, would prove satisfactory. The foundation-stone, which was laid with Masonic ceremony, forms a cinquefoil tablet in the east wall of the chapel. The works comprise a chapel; work-room, 21 ft. by 17 ft.; a dining-hall, 20 ft. by 17 ft.; a newly-constructed kitchen, scullery, store-closet, salting-closet, bath-room, wash-house, laundry, and drying-closet, which is to be so arranged that one fire will not only heat the irons for the workers, but also dry the clothes. The chapel is Mediæval in style, with stained-glass windows, and an open-timbered roof.

The architect is Mr. W. P. Griffith, F.S.A., and the builders are Messrs. Dunford & Langham.

THE NATIONAL MUSEUM, AMSTERDAM.

IN the year 1874 the Government invited in competition plans for a museum for the art-treasures in painting and sculpture dispersed in various establishments belonging, some to the Government, and some to the town of Amsterdam. Four architects who had obtained premiums in preceding international competitions were selected to compete in the present case. They were Messrs. Cuypers, Eberson, Oudshoorn, and Vogel. The jury selected the plan submitted by Mr. Cuypers, and on July 2nd, 1875, his Majesty the King appointed that gentleman architect to the Government Museums.

The first contracts, for the construction of the offices, the laying-out of the grounds, &c., were entered into on November 9th, 1876. Mr. Helsen, of Amsterdam, was the contractor at the sum of 13,095 francs.

On the 14th December, 1876, the contract for levelling the ground with pile-work and brick foundations was adjudged to J. Schoonenberg and C. J. Maks, contractors, of Amsterdam, for the sum of 197,500 francs.

The embankment of the ground, which was very low, occasioned an expense of 75,000 francs for filling up with sand to reach the level of the adjacent streets. On the 24th of May, 1877, tenders for the supply of bricks were sent in, and the contract was given to H. C. Van der Houven van Oordt, of Apeldoorn, for 218,595 francs; and on the 6th of December of the same year, the supplying of the stone, called blue stone, or little granite of the Ourthe, was adjudged to Louis Goffin & Co., of Liège, for the sum of 127,698 francs. In the year

1878 the contracts for the other materials were entered into, and also for the entire construction of the monument with the following builders: A. Boller, of Mannheim, for the stone of Roche-d'Enville, of Savonnières, &c., for the sum of 188,000 francs; to J. Schoonenberg & C. J. Maks, of Amsterdam, for the outside masonry, the woodwork, &c., for 458,000 francs; and to T. Paris Isaac, of Marchiennes, for the metal-work, roofing, and glass-work, for 299,500 francs.

In 1879 the contract for the heating and ventilating apparatus was adjudged for the sum of 47,000 francs, to Geneste Herscher & Co., of Paris. For this latter contract five firms competed. The building is now being roofed in.

The programme of the original competition exacted of the designer the provision of a public way for carriages and foot-passengers across the museum, to facilitate the communication between the old town and the new parts in course of construction. This arrangement gave at the same time a means of dividing the building for different services, the structure being destined to contain,—first, a museum of objects having reference to the national history; secondly, a cabinet of engravings; and thirdly, the picture galleries.

The first floor, spreading over the entire building, is destined for pictures. The ground floor, of which we give the plan, is divided into two sections: to the east or right of the passage is the museum of national history, whilst on the west or left of the passage is to be the cabinet of engravings as well as the library. Each division will have its special director.

NEW PULPIT AT ST. MARTIN'S CHURCH, BRIGHTON.

AT the cost of Mr. Henry Wagner, a pulpit, with lofty canopy, has been erected in the church of St. Martin, Brighton, of exceptional character; we give a view of it. The whole structure, which is of oak, stands upon a plinth of Sussex marble. The plan of the pulpit, a little over 6 ft. in diameter, is based on a heptagon. The two sides towards the wall are, however, replaced by three sides of a smaller octagon. These three sides form the back-board behind the preacher, and unite the pulpit below with the sound-board or reflector above.

The pulpit itself is 7 ft. 9 in. high from the floor level of the church to the book-board, whilst the floor of the pulpit, approached by seven steps, is raised 4 ft. 6 in. from the floor of the church. Upon the marble plinth stands a plinth of oak, from the angles of which rise pillars cut into niches, and carrying the highly-enriched cornice which marks the floor level of the pulpit. In the niches are figures of the four fathers of the church,—St. Ambrose, St. Gregory, St. Augustine, and St. Jerome. Standing as it does in the north-east angle of the nave, and being flanked by the chancel-screen, the other pillars are either invisible or are engaged in the staircase, and are consequently not so richly carved. Between the heads of these pillars depends open carved work of leaves and flowers, treated, as is the whole, in the style of woodwork prevalent in this country in the fifteenth century. The eight pillars just described surround a stouter pillar, or stem, with buttress at the angles, and panels carved in a simple linen pattern on each face. The floor on which these rest is inlaid with olive wood, which was brought by Mr. Henry Wagner from the Holy Land, and cut from off the Mount of Olives. Above the cornice we see the sides of the pulpit. One side is occupied by the stair, four by carved panels, and the other three towards the wall are formed by the back-board, already mentioned. The subjects on the panels, which are carved in low relief,—are St. Paul preaching at Athens, the Sermon on the Mount, St. John the Baptist preaching in the wilderness, and St. Augustine of Canterbury preaching Christianity in England. These panels were carved by Messrs. Trollope & Sons. The panels are separated from one another by angle-posts, which are highly enriched with bases and canopies and figures of the Four Evangelists and of St. Athanasius, cut out of the solid, as are the canopies and figures on the pillars below.

The staircase, giving access to the pulpit, has at the angles large posts, moulded and with the ends carved into figures, the panels between being pierced with small traceried openings. The back-board, occupying the three small sides of the pulpit towards the wall, is divided at each angle by groups of three hexagonal shafts, the surfaces cut into diapers of hexagons and other figures. The four groups of shafts thus placed, and two which stand detached, support the great sound-board, which is thus sustained at six angles. The heads of the supporting shafts are connected by pierced tracery and crockets.

The sound-board is based on a figure of fourteen equal sides, but several of these are lost, the back being cut into by the piers carrying the chancel arch. The heads of the shafts carrying the canopy are connected by a slightly raised band, the space comprehended within the band being of the same size as the floor of the pulpit. Projecting beyond the band, the sound-board overhangs about 2 ft., making the total width across from side to side 10 ft. The underside is inlaid and polished.

Around the edge of the sound-board is a cornice carved with the following inscription, in riband letters, "Clama, necesses quasi tuba exalta vocem tuam et annuncia populo meo scelera eorum et domus Jacob peccata eorum." At the end, in a small riband, is the date of the execution of the work, with the names of the donor, the carver, and the architect. The cornice is surmounted by a very rich pierced cresting, with stout pinnacles at each angle, and from the level of this cornice springs the lofty canopy,—14 ft. from the nave floor to the top of the sound-board, and 40 ft. 8 in. more to the summit.

The plan of the canopy is octagonal. It commences with a solid drum, surrounded by a group of detached buttresses, which are joined to one another by carved foliage and tracery, the object of which is to ease off the transition from the flat line of the sound-board to the aspiring vertical line of the canopy work.

At a height of 19 ft. from the nave floor the angles resolve themselves into pillars enclosing an octagonal space, in which is a group, the Nativity. The tops of these pillars are joined by tracery, and above this springs a mass of tabernacle-work, tracery, and pinnacles. Over the heads of the group the pillars are joined with ribs and a large central boss, consisting of a star, within which is a crown of thorns surrounding a rose.

Above the tabernacle-work the size of the octagon is somewhat diminished, and the sides are filled in solid; but at a height of 27 ft. we find a second open space, similar in general details to the foregoing. In this is a second carved group of figures, the subject being the Crucifixion, with the Blessed Virgin Mary on one side of the cross, and St. John on the other. This is again surmounted by tabernacle work, differing in design from that below; and again, the octagon diminishes still more till we arrive at a third open space surrounded by pillars, and in which is a figure of our Lord ascending. Above this is more canopy-work, and, finally, a crocketed spire, terminating in a carved finial, which comes to within 6 in. or 8 in. of the roof of the church.

With the exception of the four panels already mentioned, the whole of the work has been executed by Mr. J. E. Knox, of Doris-street, Lambeth, who also carved the reredos. The work was designed by Mr. Somers Clarke, jun., of 6, Delahay-street, Great George-street.

THE KING'S SCHOOL, SHERBORNE.

THIS school is one of the earlier foundations of Edward VI., and occupied at first some small buildings erected partially on the sites of the Lady Chapel of the abbey and of the Chapel of St. Mary-le-bow attached to it. These original school buildings still exist, and are used as the dining-hall of the school-house, and for offices. The original effigy of the founder stands over the dais of the hall; gradually the school increased, and in more modern times the "Bell buildings" were added, with others built against the walls of the ambulatory of the choir, but it was not until under the headmastership of the Rev. H. D. Harper (now principal of Jesus College, Oxford) that the school assumed its present importance.

In 1853 the late Earl Digby presented to the governors of the school a block of buildings on the north side of the abbey church, then used as mills; they consisted of the ancient Abbot's Lodgings, the Abbot's Hall, the Guesten Hall, and a small portion of the dormitory building, forming parts of three sides of a quadrangle, of which the abbey church was the fourth. These buildings were placed in the hands of the late R. C. Carpenter, under whose direction they were carefully restored. The Guesten Hall became the new school-room, the Abbot's Hall was consecrated as a chapel, and the Abbot's Lodgings were converted into boys' studies. The lower story of the Guesten Hall was used as class-rooms with an open cloister under the chapel; portions of this cloister are of Norman date, the rest of the buildings are of the fifteenth century. Later, the school-house was erected, the chapel lengthened, and class-rooms built, under the late Mr. W. Slater, chiefly through the liberality of Mr. G. D. W. Digby, of Sherborne Castle.

As the school still continued to increase, and a new scheme of the Ecclesiastical Commissioners having come into operation, fresh enlargements had to be undertaken from Mr. R. Herbert Carpenter's designs, and they have been carried out under him and Mr. Benjamin Ingelow.

A new great schoolroom has been erected, 84 ft. by 28 ft., to which, hereafter, are to be added class-rooms at its northern end.

The question of the chapel has been anxiously considered, and alternative plans had been prepared for a new one on the north side of the new quadrangle, but eventually the plans were arranged by the Rev. H. D. Harper, with the architect, for adding an aisle to the existing chapel, with buttresses, &c., of such proportions that eventually the whole chapel might be raised, and, by the removal of the temporary arcade, the area of the aisle might be incorporated in one span with the body, so as to give a chapel of more imposing dimensions. The present addition to the chapel, as shown, was designed with this idea. The lower story is of equal height with the Norman substructure of the nave, but is designed with vaulting and openings to correspond with the superstructure.

The new reredos, with its sculpture, the master's and choir stalls, and the pavement have been placed as a memorial to Dr. Harper, who left the school just as the works were commenced, being succeeded by the Rev. E. M. Young, late of Harrow.

The connecting vaulted cloister between the schoolroom and the chapel are now in course of erection, and the old schoolroom is being converted into a school-library, with fittings of oak.

The general contractor for the works is Mr. Sealey, of Sherborne, Mr. Walker being clerk of the works.

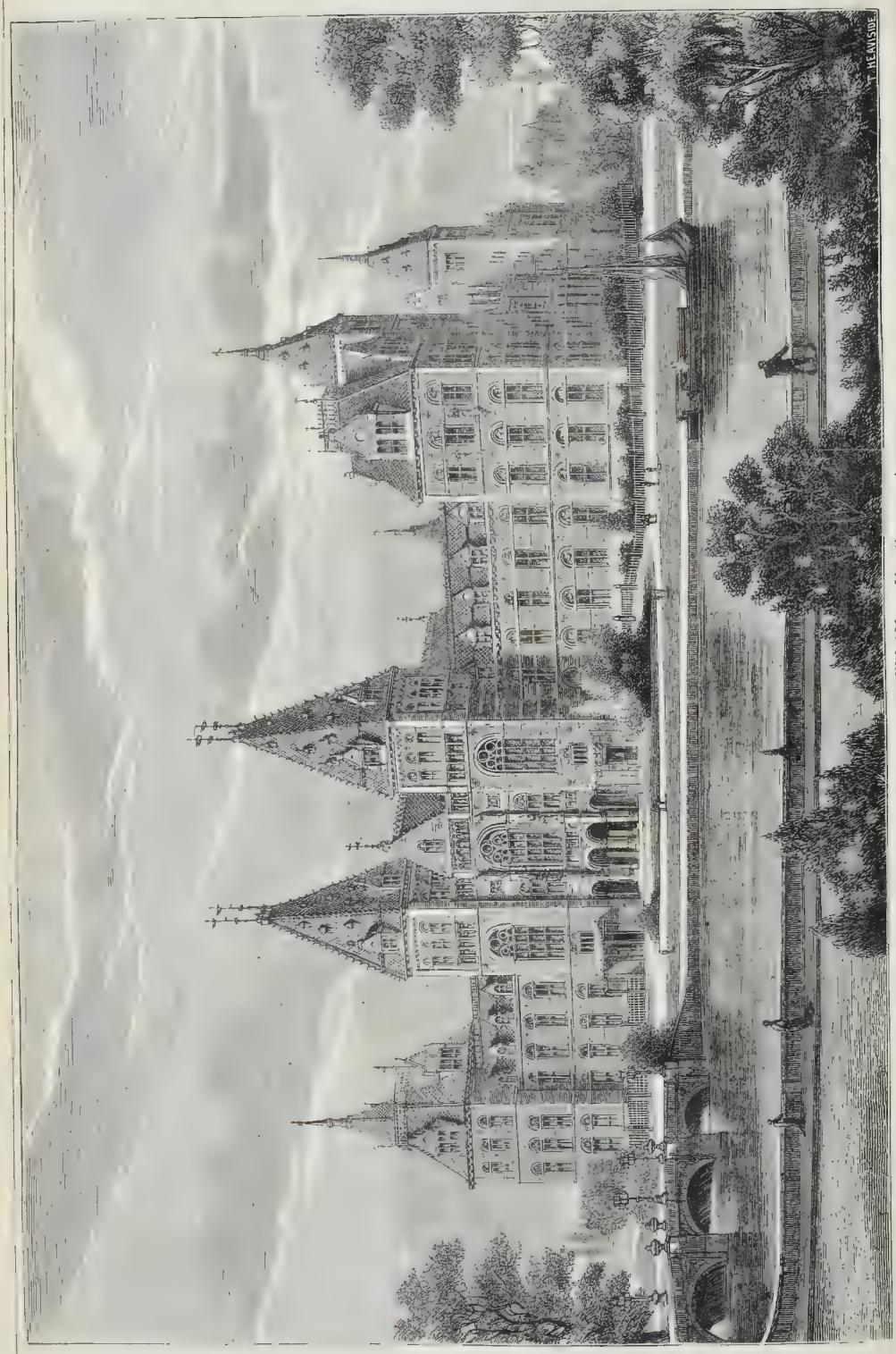
The material used is local coursed stone, with dressings of Ham-hill stone, and the roofs are covered with the local stone slates.

The block of buildings on the left-hand of the view is the ancient Abbot's Lodgings, with his private entrance from the town (the staircase to the "solar" was in the semi-octagonal projection). Next is the chapel,—the ancient Abbot's Hall,—with the clearstory of the nave of the abbey church towering over it. Then there are the connecting cloister, and the new schoolroom on the right of the view.

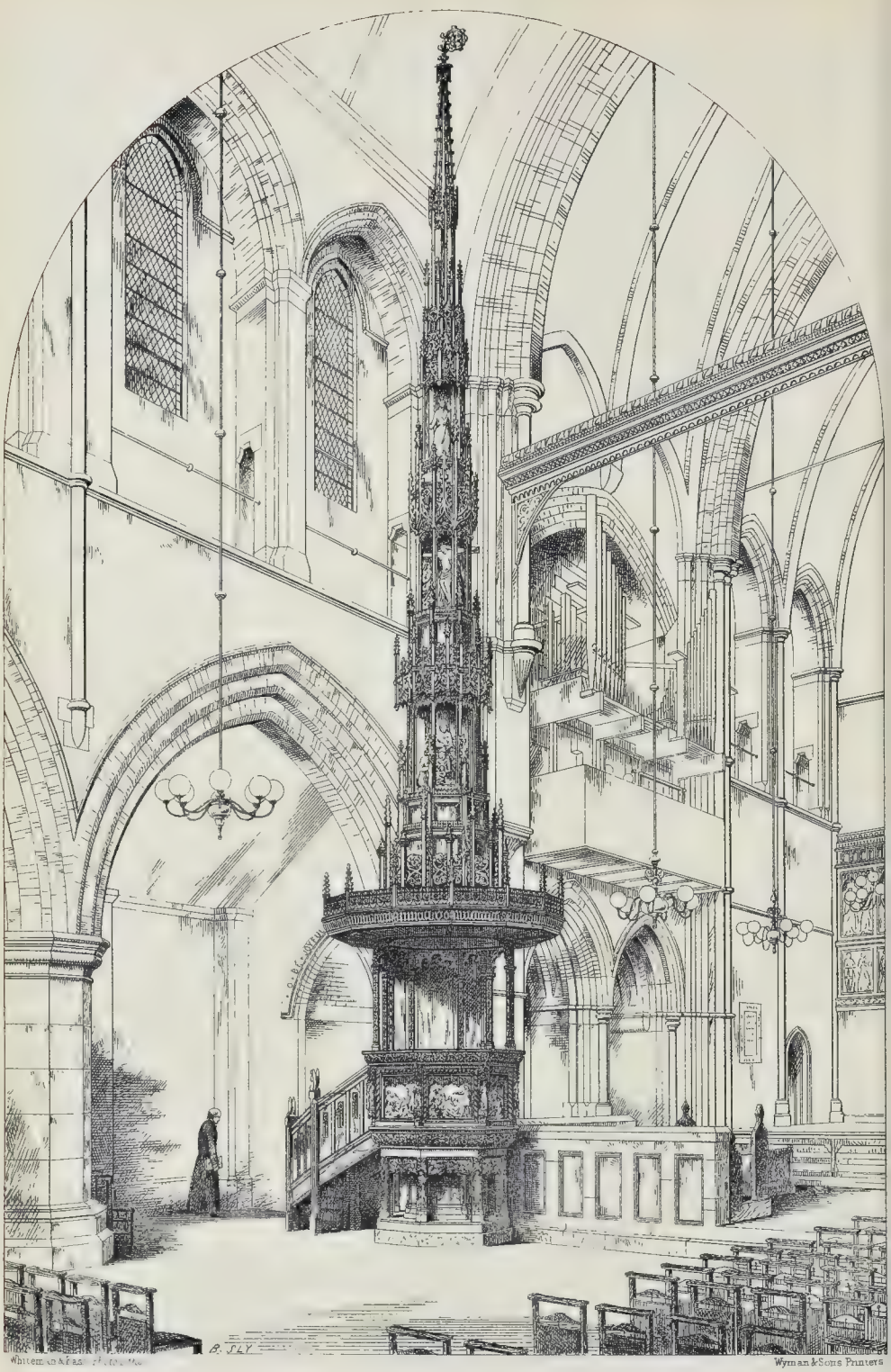
HOUSE AT LANSDOWNE-ROAD, HOVE, BRIGHTON.

THIS illustration shows a house recently erected at Brighton for Mr. F. Algar. The walls are faced with patent waterproof red facing bricks, with cornices and dressings in red terra-cotta. The floors are bordered with parquetry, and the lower panes of windows are filled with stained glass. The house has been built by Mr. J. Barnes, of Brighton, from the design and under the superintendence of Mr. H. J. Lanchester, architect, of 3, Abchurch-yard, London.

The First Avenue Hotel, about to be erected on the north side of Holborn, will have its main frontage to that thoroughfare, and return frontages to Warwick-court and Brownlow-street. The property acquired includes the site of the Duke's Theatre, burnt down some time ago and not since rebuilt. The new building will occupy a superficial area extending to nearly an acre. The hotel is to contain nearly 400 rooms, and will be called the "First Avenue" Hotel, from the fact that it is intended to have an arcade or avenue running through the middle of the block.

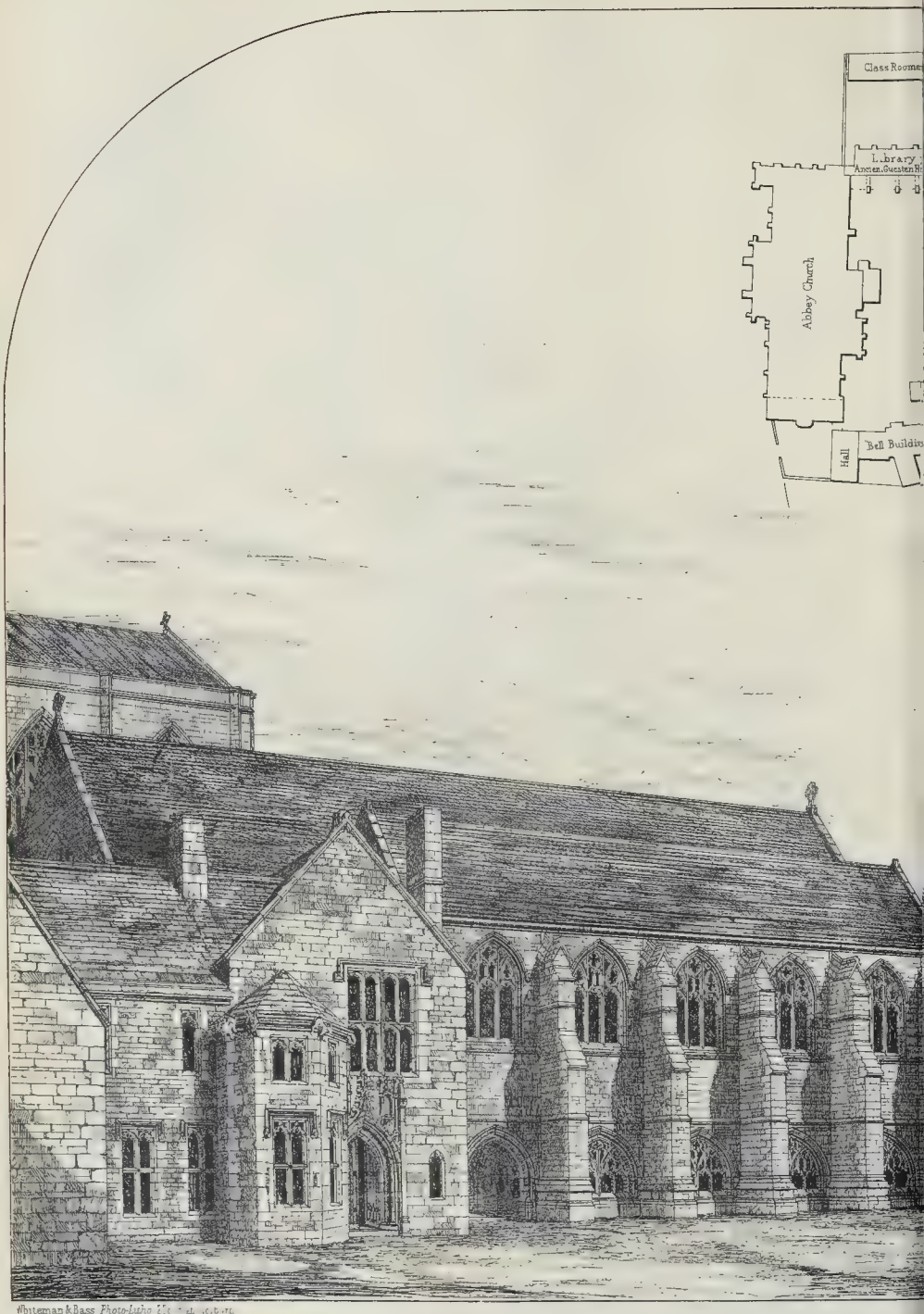


THE NATIONAL MUSEUM, AMSTERDAM.—Mr. Cuypers, Architect.



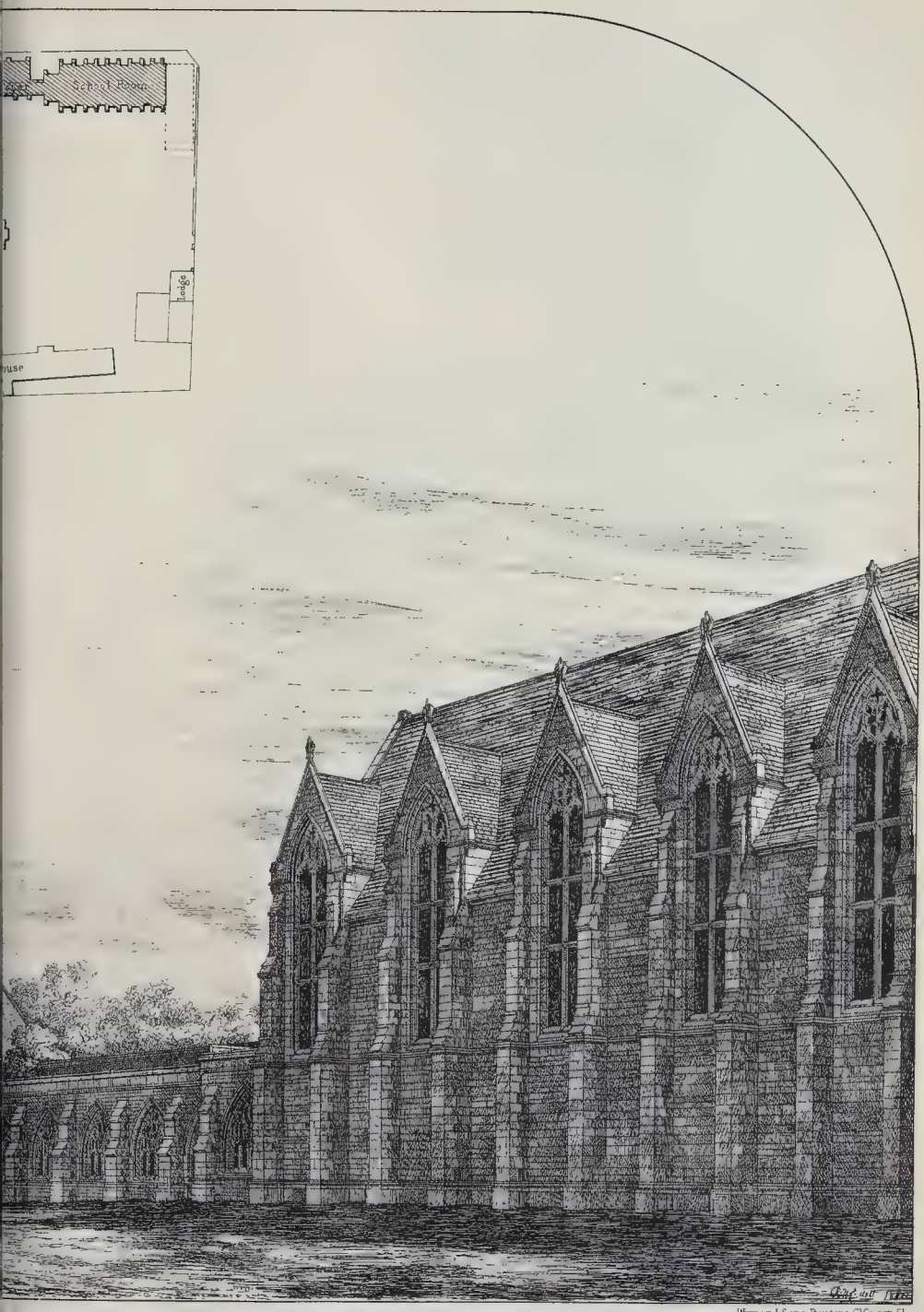
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NEW PULPIT AND CANOPY IN ST. MARTIN'S CHURCH, BRIGHTON.—Mr. Somers Clarke, Jun., Architect.



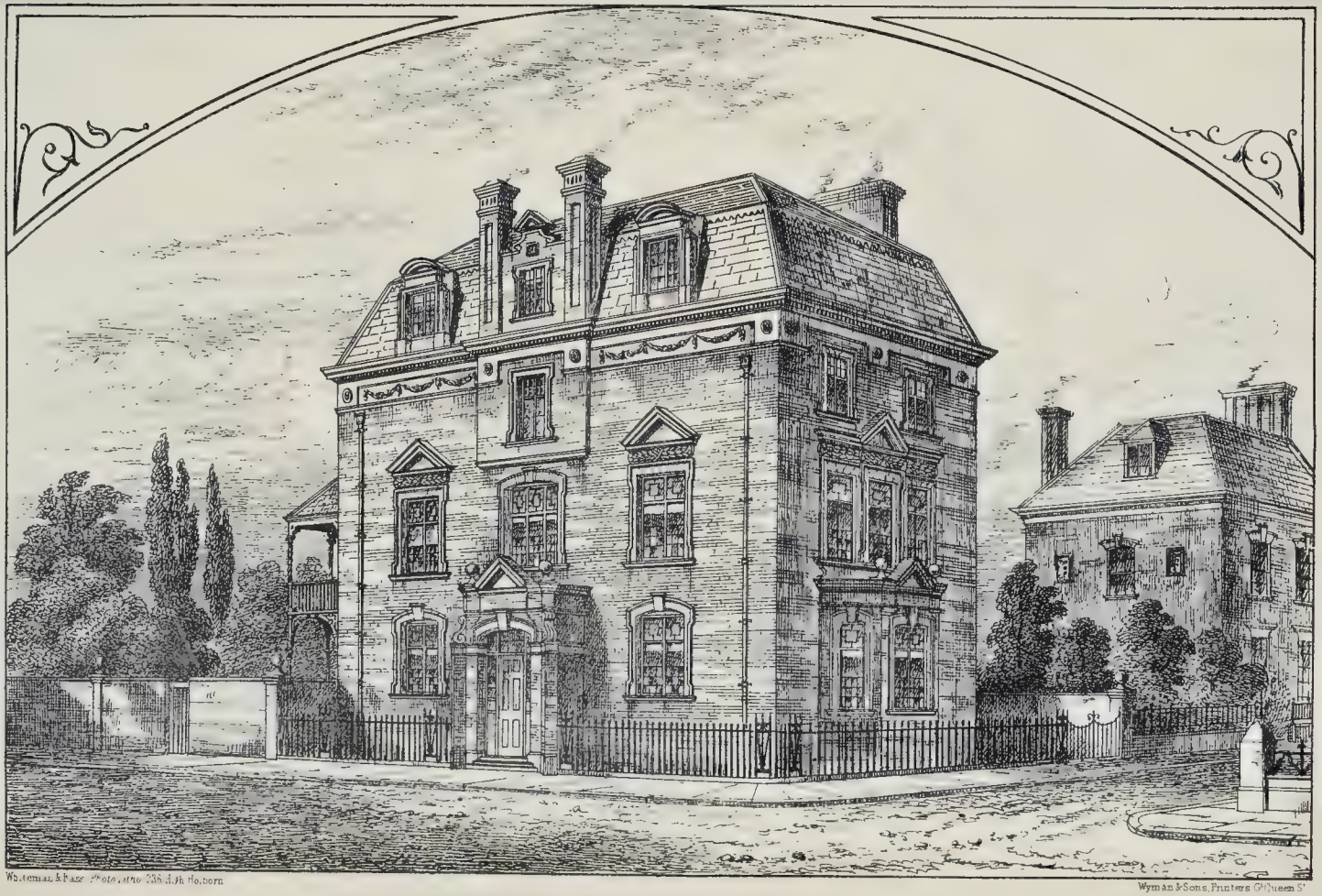
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THE KING'S SCHOOL, SHERBORNE: NEW BUILDI



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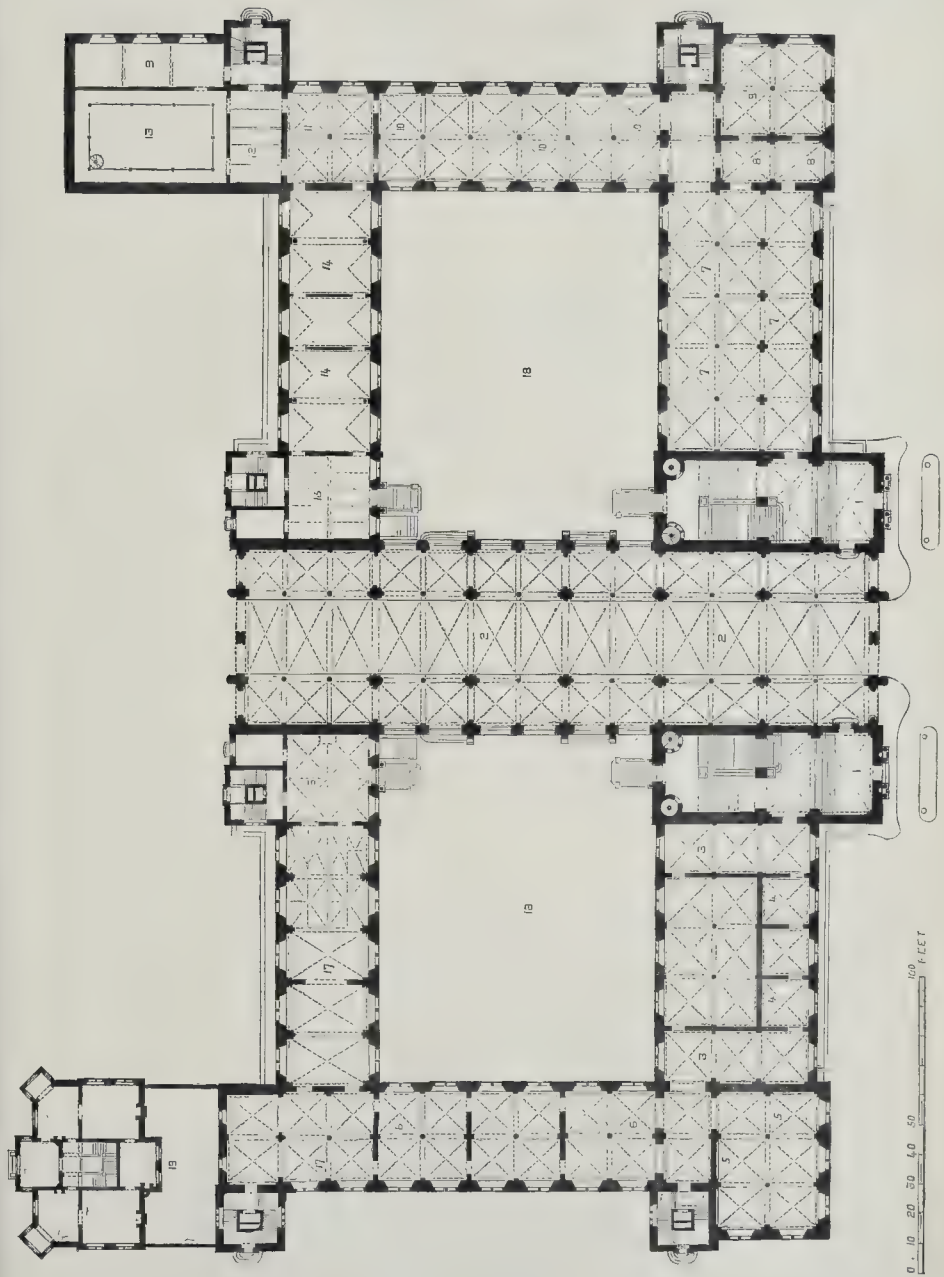
RS. R. HERBERT CARPENTER & B. INGELOW, ARCHITECTS.



Whiteman & Pace, Photo, 238 High Holborn

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HOUSE AT BRIGHTON FOR MR. F. ALGAR.— Mr. H. J. Lanchester, Architect.



THE NATIONAL MUSEUM, AMSTERDAM.—*Plan of Ground Floor.*

instead of *into* them, we have next to consider how to *maintain the purity of the air of the rooms we inhabit and defile* with our own breathing, our house warming and lighting, and cooking, &c. In this matter also, sanitary science has made many revelations of more or less gravity. The late Dr. Parkes has shown in great detail the various sources of impurity to which the air of enclosed spaces is subject, and the particular diseases to which such impurities give rise, under the title of "Ventilation,"—a term which he restricts "to the removal, by a stream of pure air, of the pulmonary and cutaneous exhalations of men, and of the products of the combustion of lights in ordinary dwellings; to which must be added, in hospitals, the additional effluvia which proceed from the persons and discharges of the sick. All other causes of impurity of air ought to be excluded by cleanliness, proper removal of solid and fluid excreta, and attention to the conditions of surrounding dwellings."

To expound the revelations of sanitary science by which the above impurities are detected, measured, and overcome, is my next intention; and, having regard to the mixed nature of my audience, I will do so in as popular a manner as possible.

It is usual to measure the impurity in the atmosphere by the proportion of carbonic acid it contains,—not because this is the only or even the chief cause of its unhealthiness, but because the presence of carbonic acid is indicative of the proportional existence of other impurities, viz., foul organic matter and moisture, and also because the amount of carbonic acid can be accurately measured, and therefore may be usefully taken as an index of impurity generally.

The average amount of carbonic acid in the air outside of the house is four parts in 10,000 parts; when it reaches six parts in 10,000 inside, the room begins to be stuffy. Dr. De Chaumont has shown that about 3,000 cubic feet of fresh air per person per hour are necessary to preserve the air quite fresh; practically, however, no more than 750 cubic feet per person per hour is attainable in this country without producing draughts.

As Dr. Corfield observes, the air in our houses is rendered impure in various ways, but chiefly by our respiration, and by the products of combustion that are allowed to escape into it from lights and fires. Thus the air that we expire contains a certain quantity of foul or putrescent organic matter. It is charged with moisture, and contains about five per cent. less oxygen, and nearly five per cent. more carbonic aid, than the air we inspire. Add to this that every foot of gas consumed is equal to the addition of one person's expiration, and the need of changing the air is quite obvious. This change of air can only be effected by the admission of fresh air and the concurrent abstraction of foul air. It is not enough to provide for the extraction of air without providing for its incoming, because the effort of natural forces seeking equilibrium will cause the air to be drawn through every crevice in doors and windows, and even through solid walls and floor, creating currents of air *en route* to the motive power, viz., the partial vacuum which the fire in the grate produces. Neither is it sufficient to provide for the admission of air if there are no means of outlet; and if the chimney-flue is closed it will not enter of itself at all, but will require to be forced into the room, by which process the occupants of the apartment will feel no more delightful sensation than is experienced by a descent in the diving-bell at the Polytechnic.

In ordinary houses, the chimney is a sufficient ventilator when associated with a means of feeding the chimney with a supply of air, to prevent its feeding itself by drawing from every crevice as aforementioned. To feed the fire directly, however, would probably prevent draughts, but it would decrease the warmth and leave the room unrefreshed by the change of fresh for expired air. Consequently it is obviously desirable to introduce the air in such a way that it may do all the good it can before it reaches the fire and is swallowed up by the chimney current.

Now, it has been proved by experiment that the ordinary current up the flue of a sitting-room fire-place is at the rate of from 3 to 6 cubic feet per second, or 300 cubic feet per minute, or 18,000 cubic feet per hour. Consequently, allowing 1,000 cubic feet of air per hour as [necessary to be extracted for each occupant of any chamber, obviously one sitting-room fire-place flue is a sufficient extractor for eighteen persons; if 3,000 cubic feet per hour be insisted on, as recommended by Dr. De Chaumont, then six persons are efficiently provided for by this means, which is all-sufficient for practical purposes in dwelling-houses, except in the reception-rooms on party nights, when a much larger volume of expired air will be required to be extracted, to make way for the equivalent of fresh air which it is necessary to introduce to keep up the interchange and to maintain the purity of the air generally. In winter this fresh air can be warmed in its passage.

The foregoing principles underlie the best of the mechanical appliances constructed for the ventilation of dwelling-houses. And proceeding upon these lines, Mr. Tobin has credit of reviving an old principle laid down by Mr. Whitehurst, F.R.S., and published in 1794, and of putting it into practical use most successfully at the Ophthalmic Ward of St. George's Hospital, which is a room about 20 ft. square by 14 ft. high. Mr. Tobin closed all extract ventilators except the open fireplace, which it is necessary to keep going, winter and summer, and day and night, to maintain the velocity of the upward current in the chimney, which was thus retained as the only and sufficient extractor. He next provided some eight or ten semi-circular zinc shafts, about 5 in. or 6 in. diameter, and 4 ft. or 5 ft. high, and fixed them at the four corners of the room, and equidistantly between them. These shafts are connected at the foot with horizontal channels leading through the thickness of the walls to the outer air, and form the fresh-air inlets,—one set of shafts being in communication with the channels leading to the outer wall gratings fixed on one side of the building, and one set of shafts communicating in a similar manner to gratings on the opposite side of the building. This was an after-thought, for when all the shafts communicated with the outer walls on one side of the building only, the room was either supplied with too little or too much air, just as the direction of the wind might happen to be towards or away from the said air inlet gratings. In this way the fresh air was introduced and the foul air extracted. No draught was felt by the patients, much less by myself and other professional visitors who congregated round the fire expecting such a result. In fact, the prophecy of Mr. Whitehurst, delivered a hundred years before, was fulfilled, thus: "Given, an air-duct about 3 ft. or 4 ft. long, and 5 in. or 6 in. diameter, fixed in either corner of the room most remote from the fire, and communicating with the external air, the incoming air will rise in a perpendicular direction to the ceiling, and being gradually diffused will soon acquire the temperature of the room. No person will be sensible of it, and the flame of a candle will not be in the least disturbed by it."

The Sanitary Engineering and Ventilating Company have done their best to improve upon this suggestion, and at the International Medical and Sanitary Exhibition at South Kensington, their various models were exhibited, showing how the blacks and dust may be intercepted in the passage of the outer air into the interior of the dwelling, and your own exhibition also furnishes examples.

The introduction of fresh air is specially provided for in a variety of stove-grates, and notably by Boyd's Hygiastic School Board stove; under the iron hearth, and through the gills at the back of the grate the fresh air passes, and is warmed in winter before it enters the room through the gratings in front of the stove, which are proportioned to the size of the room in which they are fixed for both warming and ventilating purposes.

Mr. Boyd does not consider the chimney a sufficient extractor, but always recommends extract ventilators to be used with his stoves, fixed at the foot of an air-flue built in the upper part of the wall opposite the stove, with not only a means of opening and cleansing the same, but also of heating the extract flue by a Bunsen gas-burner, as the means of rarefying the air in the shaft, and increasing the upward draught. If the objection is made that by forming extract flues you will materially increase the cost of the building by doubling the width of the chimney breasts and stacks, I answer, "No! If you are willing to do as I did, thirty years ago, at Mr. Boyd's suggestion, instead of making the withe or division between the flues of solid half-brickwork, make it a hollow flue by the introduction of cast-iron flue plates the thickness of a slate, leaving a clear 4 in. by 9 in. or 14 in., as the case may be, for a ventilating flue warmed on either side by the smoke-flues between which it is situated, occupying no more space than the ordinary flue-withe, and delivering into the open air 3 ft. below the smoke-flues through louvred openings.

But sanitary science teaches us to regard ventilation as something more than this. It has revealed to us that ventilation cannot be rightly studied and practised without due consideration of the mode of heating and lighting intended to be adopted in the room to be ventilated. Indeed, the temperature of the air within a room and without it, being different in density, in proportion that either is hotter or colder than the other, is one cause of the pressure of one atmosphere against another in search of that equilibrium which nature is ever seeking, and never finding for any length of time together. The whistling wind rustling through the woods and forests bloweth where it listeth: we hear the sound of it, but cannot tell precisely whence it cometh or whither it goeth, until we have traced to its source the provocative cause of its movement, which will be found to arise from the variations in humidity, temperature, and consequent density and pressure of the heavier against the lighter and brighter atmospheres, with which the former impinges upon the latter. Thus the draughts in a room are the result of the pressure of the cold air of the street or passage in its struggle to get to the warm air of the room, and particularly that part of it from which the heat is generated and projected.

When two rooms are of the same temperature, the air is stagnant; that is to say, no movement of the air from one to the other will take place by the opening of a means of communication between them. It is obvious, therefore, that if the whole of the interior of a house were equally warmed without the provision of inlets for fresh and outlets for foul air, there would be no change of air from one part of the house to another. But each room might be separately lighted, warmed, and ventilated by inlets and outlets, and yet the same temperature might be maintained, but with this difference, that there would be no stagnation, but pure fresh air, warmed as it entered for free inspiration, and withdrawn as by expiration or combustion it became impure. In the ventilation and warming of the house, the hall and staircase should not be forgotten. The best salvation from the wasteful consumption of fuel is the withdrawal of the cause of the draughtiness of rooms when the door is opened, arising from the difference in temperature between the sitting-room and the hall, by the introduction of a good hall fire or other system of warming the entrance-hall and staircase.

With reference to the lighting of rooms, of course the softest and most agreeable method is by wax candles, but the cheapness and brilliancy of gas, and its easy application has led to its general adoption, regardless of the sanitary consequences. For as Dr. Corfield observes in his Cantor lectures, "Candles, lamps, and gas all help to render the air impure."

"It is calculated that two sperm candles, or one good oil lamp, render the air about as impure as one man's respiration does, whereas one gas-burner will consume as much oxygen and give out as much carbonic acid as five or six men, or even more. This is why it is commonly considered that gas is more injurious than lamps and candles, and so it is, when the quantities of light are not compared; but with the same quantity of light, gas renders the air of a room less impure than either lamps or candles." Common sense at once suggests that the products of combustion should be carried away, and the heat generated by the process should be utilised to expedite its removal, and several manufacturers have turned their attention to this desirable end, and at the International Medical and Sanitary Exhibition, and at your own exhibition in this town of Eastbourne, examples may be found of many means to attain this end. Strode's sun-burners, Benham's globe light, Faraday's pendants, and many more appliances, all seek to give practical application to the principles above referred to. But we are fast arriving at the best solution of this difficulty through the agency of electricity. The sanitary side of this new lighting power is to us the most interesting. By the Lane-Fox and Swan incandescent lights, unequalled brilliancy, steadiness, and continuity of light are capable of being maintained, and this all pro-

duced within a vacuum formed within the globe of glass in which the light is produced; and consequently, by the use of these lights (which are becoming more common every day and will soon supersede gas altogether), no heat is generated, no dirt is caused, and no products of combustion mingle with the air of the room, from which no provision needs to be made in its ventilation for this system of lighting, which, as hereinbefore explained, is so necessary in the case of other lights.

This brief review of the Revelations of Sanitary Science would not be complete without a few words on heating.

The natural process by which the temperature of the air is raised is either by radiation or conduction. Conduction, or rather conducted heat, is the warmth given off to the air by heated surfaces brought into immediate contact therewith. Such heat in the ordinary fire-place is carried up the chimney, and the systems in use for generating it are known as hot-air stoves or flues, hot water carried in cast-iron pipes at low pressure, or in wrought iron pipes at high pressure, and steam pipe apparatus.

Radiated heat is like that of the sun, which passes through the air as light without heating it, into the earth or any intervening substance, from which the heat is given off gradually to the atmosphere, creating the difference between sun and shade temperature. Thus it is that the conducted heat of an open fire goes up the chimney, as I have said, and about a sixth part only is radiated into the room, passing through the air without sensibly heating it, but warming the first obstacle to its progress, such as the inclosing walls and furniture, by which the radiated heat is given off to the air of the room, raising its temperature as required. It cannot be called an economical mode of heating, being but one-sixth of the means to the end; but it is the most enjoyable and the most healthy. All the products of combustion pass up the chimney, and draw after them the impurities and denser air of the room lying lowest, while the vivifying rays of the crackling fire heat without scorching the surfaces that warm the air of the room insensibly.

The primary but not the exclusive object in the improvement of an open fire stove must obviously be the increase of its radiating power by reflection from heated polished surfaces in close contact with the fire, and this is done by many of the best stoves,—one of the latest of which is Messrs. Comyn, Ching, & Co.'s new stove called "The Paramount." In this case the fire-basket or grate is quite disconnected from the brickwork surrounding it, and equally so from the metal case, excepting at the point of contact with the bracket which sustains the circular grate. Thus the fire is enabled to radiate as from a centre all round. The rays of heat emitted from the back and sides of the fire-basket, impinging on the metal reflector of the back and sides, are reflected forward into the room and utilised, instead of being lost as before.

The secondary object, economy in fuel, is attained by the first, and by bringing in conducted heat from chambers provided at the back of the grate; and the third is the consumption of smoke. This has occupied a great deal of attention of late, with the object of purifying the air of blacks and the reduction of London fogs. An exhibition of stoves designed with this object will take place in London in October, and we shall soon see with what result.

In the meantime, the "Wonderful Grate" exhibited by Messrs. Smith & Co., at the London Sanitary Exhibition, accomplishes a great deal in this direction. It is an open fire-grate, and yet consumes its own smoke. It burns anthracite coal. It is fed with fuel in the morning, and needs no attention till night, until the fuel is consumed. It requires no stoking, yet has always a clear, bright, red fire, the radiating power of which is considerable. Then there is Dr. Siemens's grate, which is an attempt to combine gas with anthracite coal, and a host of others.

The history of the heating and ventilation of the British House of Commons, both old and new, is perhaps as instructive a lesson in this branch of sanitary science as any which could be named. Sir Christopher Wren, Captain Cook, Sir Humphrey Davy, the Marquis de Chabannes, and many others tried their hand at the old building. Dr. Reid, Mr. Gurney, and the present Dr. Percy, have had their way with the new. However, it is not my intention to refer to public buildings now, but only to draw attention to the importance of the principles laid down by sanitary science which are applicable to all householders, and the revelations of which I have now traced as they have influenced house-drainage and the ventilation of the same, house warming and lighting, and the ventilation of the rooms in which we live and move and have our being.

If I have made no new revelations, I have at least endeavoured to popularise the old, and I think we may look forward with confidence, as the result of such exhibitions as that which you have inaugurated in this town, that their need will become less and less as time advances, knowledge increases, and the evidence of the value of these revelations accumulates. It is a work of "sweetness and light." It aims to realise that which hitherto has existed more in the imagination of the poet than in fact,—

"Home, *sweet* home."

THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT MALVERN.*

FOLLOWING the reading of Mr. Hopkins's paper on the history and architecture of the Priory Church at Malvern,

Mr. Loftus Brock, F.S.A., pointed out the analogy in date and construction between Malvern and Gloucester churches. The church of Gloucester was dedicated in 1100, and the tower was built about 1450. The capitals of the Norman pillars of Gloucester agreed in the smallest details with those of Malvern. He knew of no large Norman church without the apse. It was from the earliest times a sign of Latin influence. The little Roman church unearthed at Canterbury had the apse. The apse was not found in the old Irish churches and many of the Saxon churches. The fact that Malvern Church was dedicated in 1239 had puzzled some writers. Matthew Paris threw light on the subject, showing that it was in obedience to constitutions made in London in 1237 by the Papal legate. The inference was that many churches had remained unconsecrated for a long time; and it was probable that many old churches had never been consecrated at all.

There was an excursion to Ripple, Bredon, Overbury, and Tewkesbury on the second day (Tuesday, August 23rd), when more than 100 members and visitors journeyed by special train to Ripple. On the way to the parish church, the party halted at the village cross, which is of oolite, and very much resembles the cross in Malvern churchyard. Beneath the cross still stand the stocks. At the church, the rector, Mr. Holmes, was in waiting, and gave from the pulpit a little history of the church. There was a monastery at Ripple before the year 800, and probably an older building stood on the site of the present church, which was largely of the thirteenth century. Some very curious oak carvings, thought to be the misereres of some collegiate church, attracted much notice. It is believed that, as they were once in the hands of Bishop Hough, they came from Worcester. Most of them represented agricultural pursuits, such as binding corn or driving animals. Another showed a couple of monks cooking.

A heavy storm burst over the valley of the Severn as the travellers set out in brakes from Ripple. Having passed through Twyning and Twyning Fleet, they forded the Avon by the ferry-boat, and soon reached Bredon Church, which afforded welcome shelter from the drenching rain. Mr. Adye, curate in charge, read a short paper, giving an account of the history of the church, referring, among other things, to the residence in Bredon of John Prideaux, bishop of Worcester. In the churchyard was noticed a singular example of a high tomb with a coped top, but to whom it was raised is not known. A so-called "parvise," over the Norman porch on the north side of the church, was pointed out, but Sir James A. Picton, F.S.A., explained that there was no authority for the term "parvise," as far as he had been able to trace, and he therefore considered it only a fanciful one, and of little or no meaning. Mr. Loftus Brock gave an interesting little dissertation on the church. He thought it a beautiful specimen of the architecture of the early part of the thirteenth century. The three entrances were all round-headed, with the zig-zag ornament; but the mouldings were the same as those of some of the internal arches. The plan was Norman, with a tower between the nave and chancel. One of the large windows was Decorated, and another Perpendicular; but the district was one which afforded few examples of the Decorated. The sepulchral slab, placed in an erect position in the south chancel wall, was very remarkable. It represented our Lord on the cross, and probably the husband and wife who founded the chantry chapel. The recessed canopy on the other side of the chancel might possibly have been intended for an Easter sepulchre. The monument was decorated with the ball-flower ornament, which was very prevalent in the district. The steps were paved with encaustic tiles, bearing the armorial bearings of the Beauchamp and other families. A peculiarity of the church was its great ascent from west to east. In the chantry chapel one of the monuments testified to the old form of heart burial. The monument to the memory of Giles Reed, sheriff of Worcester, was one of much magnificence. The church was a "peculiar," not being under the visitation of any bishop. After looking at the church, several of the party went to inspect the celebrated tithe-barn, which remains to this day a splendid example of the skill of the carpenters of the fourteenth century.

The unfavourable weather compelled the abandonment of a visit to Bredon camp, and the next halting-place was Overbury Church. It is rarely that the archæologist comes upon so fine an example of the Norman village church. The massive pillars of the nave, so low that the hand can reach the top of them, remain in all their completeness; but the small circular-headed windows above, which at one time lighted the nave, have now become an internal feature, owing to the rebuilding of the aisles in later times. An Early English chancel was also added in later times. Mr. Glynn descanted on a few of the features of the church. The font caused some little speculation. It was admitted to be of the very earliest type; and some present, judging especially by the representation of a church in the hands of a saint, pronounced it to be Saxon. The party next drove on to Tewkesbury, where they partook of luncheon at the Swan Hotel. During the afternoon the Abbey Church was visited, and a paper, by the Rev. Hemming Robeson, the vicar, was read by Mr. Sergeant.

Mr. Robeson's paper, after briefly referring to the origin of the name "Tewkesbury," said it was probable that there was an Anglo-Saxon church there in the eighth century, and then, passing on to the Norman period, he pointed out in the choir the Fitz-Hamon, or, as it was called, the Founders' Chapel, on the north side, which carried them back to the period following the Norman Conquest (1066). At that period two notable figures rose up before them,—that of Fitz-Hamon, a nephew by marriage of the Conqueror, the first founder of the present abbey, and his son in-law Robert Fitz-Roy, Earl of Gloucester, a left-handed son of Henry I. These two figures, after some twenty-two generations had passed, speak to us, if he might say so, even to-day from the Norman pillars of the church, from the transepts and great central tower which surmount the present abbey. It was in the main still their church. The first Earl of Gloucester was called the second great founder of the abbey. In the lifetime of his eldest son, Earl William, a destructive fire destroyed (in 1178) the monastic buildings, and left its traces also on the south wall of the church. It was said King John resided for a time at Tewkesbury in the year of his coronation, 1200. At that time the abbey came under the interdiction of Pope Innocent III. Abbot Alan was afterwards translated from the Priory of Canterbury to preside over this abbey in 1187. His tomb was on the left of the vestry door, and his coffin-lid bore the inscription, "Alanus Dominus Abbas." In 1795 the coffin was opened, and the abbot was seen lying in his vestments, with the cross and chalice, as he had been laid there 600 years before. The next family that became lords of Tewkesbury was that of the De Clares, of whom Mr. Robeson gave a history, and pointed out their burial-place. During the lordship of the De Clares, however, no considerable additions were made to the fabric of the abbey, though he must not pass over the two beautiful chapels in the north transept (now united by an arch of the fourteenth century) which belonged to the thirteenth century,—about 1230. What he might call the first great change from the Norman work of the Fitz-Hamons belonged to the time of the Despencers, into whose hands the lordship of Tewkesbury passed through the

* See p. 265, *ante*.

marriage of Eleanor, eldest sister of the last De Clare, who was slain at Bannockburn, with Hugh Despencer the younger, in 1321. Mr. Robeson then glanced at the history of each of the Despencers, whose monuments formed the most striking architectural beauties of the choir of the church. Sir Gilbert Scott had described the alterations which took place at that period, which now consisted nearly of the reconstruction of the whole eastern arm of the church from the Norman into the Decorated architecture of the fourteenth century. Sir Gilbert added that it was probably carried out at the cost of the Despencers. The brasses recording their respective resting-places were, therefore, he thought, hardly necessary to perpetuate their memory. It was enough to say, "*Cive virtute*." The several Despencer monuments were then all pointed out and described. What was generally known as the Warwick chapel, he said, ought rather to be called the Beauchamp chapel. It was erected in 1422 by the Lady Isabel, sister of the last Lord Despencer, in memory of her first husband, Richard Beauchamp, Earl of Abergavenny, who fought at Agincourt. On the death of her husband at the siege of Meaux, in 1421, the young widow raised to his memory the sumptuous chantry chapel, and took for her second husband another Richard Beauchamp, the well-known Earl of Warwick. The rev. gentleman concluded with some remarks on the recent restoration.

It had been intended that the site of the battle-field should be visited, but this was abandoned, owing to the badness of the weather.

At the evening meeting, held in the Council Room of Malvern College, Mr. J. Tom Burgess, F.S.A., delivered an address on "The Ancient Encampments of the Malverns," which was illustrated by a valuable collection of plans by Mr. H. H. Lines, of Worcester, and Sir Henry Dryden. Mr. Burgess said a few years ago it was his lot to read a paper at the Wolverhampton Congress of the Association on the remarkable series of earthworks then recently found on the northern bank of the river Avon; and he had occasion to point out how like in several respects these earthworks were to those extending along the Cotswolds into Gloucestershire. These two chains of earthworks represented two different races. He had now undertaken to point out the particular features of the earthworks visible from the Malvern Hills. Having spoken of the earthworks at Meon Hill and on Bredon, he referred to some remains apparently indicating a large settlement on the North Hill, at Malvern, and to those of an ancient village above St. Ann's Well. As they approached the great mid-range of the Malverns, they found themselves at the foot of a conical hill, the Herefordshire Beacon, which was terraced and cut into forms most unusual. When they had scaled the ramparts, they were in the midst of a ditch wide enough to allow a chariot to pass along it; and going along, they came to the central mound, with a thick vallum and low ditch. Looking round, the eye beheld one of the most charming panoramas that could possibly be found. The next thing that struck one, next to the vastness of the work, was that it appeared to have been erected at very different times. The central mound was oval, it ran in a peculiar direction, and originally had only one entrance into it. About two years ago it was resolved to find, if possible, what the mound contained; and a variety of bones of domestic animals, and pieces of pottery of the Romano-British period, were found. A midden was opened containing some burnt pottery. A peculiar piece of slate, drilled with a hole, was also found. It had been called a burnisher; but he believed that it was simply a sinker for a fishing-line. An iron arrow-head was found; but, with these exceptions, there were no indications of the life of the original inhabitants to show that they did more than eat and drink. The whole of the hill was encircled by covered fosse-ways, along which people could pass without being observed from the outside. About a mile and a half further along the range, on the Midsummer Hill, there were entrenchments of an entirely different kind. At the entrance there were sunk pits, evidently for guarding the sentinels. Passing along the rampart, one came to a lower series of entrenchments, of a very remarkable character. This camp he took to be the oldest of the two camps. It appeared to have been one of the old settlements of the tribe. Mr. Burgess referred to the great struggle between the Ancient Britons and the Romans, of which the neighbourhood was the scene; but expressed his opinion that the Herefordshire Beacon had been occupied by more than one people. It was probably held by the Welsh up to about 950, when Athelstan took it. To that period he should assign the crown found in the neighbourhood in the seventeenth century.

Mr. Brock read a letter he had received from Mr. M. H. Bloxam, F.S.A., of Rugby, in which he expressed his opinion that the ancient British camps in Worcestershire were the fortresses of the Silures, whose eastern boundary he took to be the Severn. The contest of the nine years' war between the Romans and Caractacus it might be fairly assumed was on this ground. He knew of no one better qualified to investigate these earthworks than Mr. Burgess. Mr. Brock added that they could not but be struck with the general analogy between the Malvern camps and two great camps at opposite extremities of England—Sisbury and Castle Hill, Huddersfield. In one of the great camps, which Mr. Burgess had so graphically described, there was—first, the fortress proper; second, the hut dwellings; and third, the part for cattle. These fortresses were not camps in the proper sense, but towns. Through the labours of Mr. Burgess, Mr. Roach Smith, and other gentlemen, they were beginning to see the real nature of the camps, and to learn that they were not thrown up hurriedly or hastily.

Mr. G. R. Wright, F.S.A., referring to the finding of the crown, pointed out the necessity for an alteration in the law of treasure trove.

Mr. J. Nott then read a paper on "The Glass of the Priory Church." He said that most of the windows were but mere fragmentary remains. Some of the glass was as clear and beautiful as when it was first painted. The dates of the windows were fourteenth, fifteenth, and sixteenth centuries. That in St. Anne's Chapel treated of "The Creation" and "Fall of Man," in twelve pictures; representing the Almighty forming the universe out of chaos; the creation of the moon and the stars, plants, fowls, beasts, and trees; Adam asleep, and the Deity taking a rib to create woman; God leading Adam and Eve into Paradise, the temptation, the hiding among the trees of the garden, the expulsion from the garden, Adam tilling the ground, and Eve nursing the infant Cain. Another represented incidents in the history of Noah and the Ark, Babel, and the marriage of Abel. In the south window were God appearing to Abraham, Abraham taking Sarah to wife, the casting out of Hagar, the journeying to Mount Moriah, and Isaac sending Esau for venison. The east window (Perpendicular) represented the Annunciation, the Twelve Apostles, scenes from our Lord's life and passion, our Lord's triumphal entry into Jerusalem, the Last Supper, the Betrayal, the Scourging of Jesus, Christ raised on the Cross, and the Descent from the Cross. In the north window can be traced the Trinity crowning the Virgin Mary; there is also represented the offering of the Magi, Adam and Eve praying in the midst of infernal spirits, and our Saviour leading them out of Hell; the turning of the water into wine; and other pictures and portraits had once had place. In the clearstory window of the choir was the only record left of the Legend of St. Werstan. Description would not, however, fairly depict them, they must be carefully examined to be appreciated.

Mr. Johnson Cope said that in these windows of the olden time there was a gem-like appearance and soberness of colouring which were very charming.

Mr. Brock referred to the great loss of painted glass which had taken place in the past, owing to carelessness. All they knew about St. Werstan was from the four little pictures in glass in Malvern Abbey Church. He should ascribe the glass to English artists.

On the third day (Wednesday, the 24th) excursionists to Bosbury, Ledbury, Much Marcle, and Kempley were favoured with better weather than prevailed on the previous day. Starting by train for Ledbury, carriages were taken there, and the party proceeded to Bosbury, where the Early English church and its detached tower were examined. The detached tower is a curious feature in the church architecture of Herefordshire. The Rev. S. Bentley read a paper at the church. Some vestiges of the old palace of the bishops of Hereford were inspected. The party then returned to Ledbury, where they arrived shortly before noon. One of the first objects that attracts the attention of a stranger in Ledbury is the timbered Market-house. As Herefordshire is peculiar for its detached church towers, so again it can boast of its peculiar town-halls or market-houses, either as existing or as preserved in sketches. Two of the most beautiful—those of Hereford and Leominster—have disappeared within the last half-century. Ledbury Market-house, elevated on its sixteen oak pillars, remains. The church was entered through the fine Norman doorway. The building presents points of much interest to the antiquary. It was originally a Norman structure of great size and beauty. During seven or eight centuries, however, it has undergone great transformations. The round openings of the chancel, which at first doubtless were intended to let in light, have now, by the raising of the aisles, become an internal feature. In this respect the chancel of Ledbury is like the little nave of Overbury, where the small round-headed windows now look into the aisles. St. Catherine's Chapel is richly decorated with the ball-flower ornament. The monuments of the church are very beautiful. A modern altar-tomb, with a figure of a child, by Thorneycroft, was much admired. The Rev. J. Jackson read a paper on the history and architecture of the church. Near the church was a narrow lane called Cabbage-lane, which was a corruption of the word Capuchin, indicating, perhaps, that at an early period of English history a body of Capuchin monks were established at Ledbury. If any remains of an older church than the present one still existed, they were to be found in the hagioscope on the north side of the chancel. Shortly after the Conquest a Norman church existed on this spot, as was still evidenced by the Norman doorway, the chancel arch, and other remains. It was curious that the east and west sides of the chancel arch did not correspond. In the early part of the thirteenth century the Norman side aisles were taken down, and in the early part of the fourteenth century the south arcade was taken down. It was also in the fourteenth century that the beautiful chapel of St. Catherine was built. St. Catherine was a religious woman who in the time of Edward II. settled at Ledbury. The lower part of the tower, which had always been separate from the church, was of Early English character.

Mr. Brock said that it was not improbable that Ledbury Church was a school of architecture to the district in which it was placed. It was a very unusual thing for a Norman church to exist of so great a length. The capitals of the arches of the chancel exactly agreed with those of Overbury Church. He attributed the whole of the Norman work to the close of the twelfth century. There was a fragment of an older church at the back of one of the piers, as was shown by the jointings.

Luncheon was partaken of at the Feathers Hotel, after which the party drove to Much Marcle Church, which was described by Mr. G. H. Piper. Kempley was next visited, and its interesting wall-paintings, discovered a few years since, were described by the Rev. J. Crowley Weaver, the rector. Attention was called by some of the visitors to the dangerous state of the tower. The party returned from Ledbury by train to Malvern.

At the evening meeting in Malvern, Mr. Wright read a paper on "The alleged Assassination of Prince Edward after the Battle of Tewkesbury."

The Rev. Canon Winnington-Ingram followed with a paper on "The Ecclesiastical State of the Diocese of Worcester during the Episcopate of John Carpenter" (1444-76).

On the fourth day (Thursday, the 25th), specimens of ancient domestic architecture at Birtsmorton Court, Payne's Place, and Severn End were visited. The weather was, as on Tuesday, wet and cheerless. Birtsmorton Court and Church were described by Mr. W. S. Symonds and Mr. Loftus Brock, Payne's Place by the Rev. J. M. Guilding, and Severn End by the Rev. T. W. Wood. Severn End, said Mr. Wood, assumed its present form in the days of Sir Nicholas Lechmere, a nephew of Sir Thomas Overbury. Sir Nicholas was born in 1613, and called to the bar in 1641. In 1656 he found it necessary to pull down and rebuild part of the house; in 1658 he finished the garden wall, and in 1661 he built himself a study in the garden. Severn End was sold many years ago to a Leicestershire gentleman, but was recovered by the late baronet. For more than 700 years the family lived on that spot; and although the present owner did not reside there permanently, he delighted in keeping up the old place where his ancestors lived and died.

At the evening meeting in Malvern, Mr. C. H. Compton read a paper on "The Antiquity of the Game of Golf," and the Rev. W. S. Lach-Smyrna one on "The Records of Municipal Corporations," with special reference to Cornish boroughs.

On the fifth day (Friday, the 26th) the members visited Kidderminster, where they were received in the council-chamber of the town-hall by the Mayor (Mr. H. R. Willis). Mr. J. Brinton, M.P., spoke of the interest with which the visit of the Society to Kidderminster was regarded, and said it was a fortuitous incident that several old charters belonging to the town, which had for a long time been missing, were found on the previous evening. He said that Kidderminster, anciently written Chiderminster, was supposed to owe its name either to the position of its church standing on the brow of a hill, with the water flowing beneath, or what appeared more reasonable, from the Saxon Earl Cynehorr, who received land here from Ethelbald, king of the South Angles, A.D. 716 to 757. When Domesday-book was compiled, Chidermiuster was held by William the Conqueror, along with sixteen berewicks, or corn-farms, most of the names of which could still be traced in the locality. Henry III. stayed in the town in 1233. It afterwards passed into the possession of the Beauchamp family, and then to the Foleys, and afterwards to the Ward family. The poet Waller acquired portion of the manor by purchase in Charles I.'s time. After some comments had been made by the visitors on the "loving cup," the charters, and various old documents, thanks were voted to the Mayor and Corporation, and the party visited an old crypt at the Fleece Inn, and thence went to the New Meeting, where they saw the pulpit in which Baxter preached in Kidderminster. They next went to the parish church, and in the chantry adjoining an interesting address as to the objects of antiquarian interest connected with the ancient fabric was delivered by the Vicar (the Rev. T. L. Claughton). The church was then inspected, and the party afterwards returned to the town-hall, where vehicles were awaiting to convey them to Wars Hill, Ribbesford Church, Arley Kings, and the Redstone Rock. They afterwards visited Moor Hall, where they were entertained by Mr. Brinton.

[By a misprint, the Guesten Hall, at Worcester, was last week erroneously spoken of as the "Gulston" Hall.]

THREE CITY GUILDS.

PAINTERS, PLUMBERS, AND FOUNDERS.

THE City Guilds Commission of 1834-37 brought together in their report a great amount of interesting information relating to the City Guilds and the duties and privileges which pertained to them in ancient times. A writer in the *City Press* has called attention to the subject, which now derives fresh interest from the efforts being made by some of the Guilds in furtherance of technical education and excellence of workmanship.

The *Painters'* or Painter Stainers' Company could, and still (in 1837) occasionally did, proceed against painters not free of the company practising the mystery in the City and liberties. For a considerable period the powers conferred by the charters were considered as extending not merely to the trade, but to the higher branches of the art. This fact appeared very clearly, not only from the language of the by-laws, but also from the names recorded in the books of the company. Verrio, Sir Godfrey Kneller, and many of the principal portrait-painters of the seventeenth and eighteenth centuries, were members of the company. Even Sir Joshua Reynolds thought it expedient to enrol himself as a Painter Stainer. For some time anterior to the date of the inquiry, however, the company had considered themselves as having control only over house-painters. Nor were even those contracted rights rigidly enforced. The City authorities had not given, it was testified, much assistance, even when they were trying to enforce their own Acts of Common Council. The clerk to the company had repeatedly given notice to the Chamberlain of non-freemen working as painters within the City, but no proceedings had been taken against them. In 1832 the contractor employed by the Common Council for painting the Mansion House was not a freeman of the company, or even of the City, and many of the workmen employed by or under the contractor were also non-freemen. In this case the clerk of the company gave notice of the facts of the case to the General Purposes Committee of the Common Council, but they took no notice of his communication. The contractor afterwards became a freeman of the company. We may add to this that a great deal of interesting information about this company is to be found in a little book written two or three years ago by our esteemed friend Mr. J. G. Crace, then Master of the company.

The *Plumbers* had retained an important and (in every sense but the pecuniary) a valuable privilege. They had not abandoned, but only fitfully exercised, the power of inspecting and searching houses, shops, and warehouses, and other places where the art or trade of a plumber was carried on in the City and within seven miles of it. This voluntarily-relinquished power applied to "workmanship, weights, beams, scales, and all other things whatsoever in any manner concerning the said art and mystery, and to see as to the buying lead of suspected persons, and to fine such persons as they shall find in default." But in an important department of their vocation the Plumbers still retained and exercised—and very much to the public advantage—their ancient authority. By their charter no person was to make, anneal, or sell any solder unless the same should be first assayed and found to be true. When required by any freeman of the company, the beadle attended at his shop and superintended the making of solder, which being all made and cast in bar, and the solder having been assayed by the beadle, the master and wardens then attended at the shop, and sealed the solder with the seal of the company, as directed by the charter. The assay consisted in ascertaining the due proportion of the metals employed, and whether they were mixed at the proper temperature, upon which much of the goodness of the solder depends. Sometimes six or more assays were taken before the beadle was satisfied with the alloy. The stamp, being a certificate that the article had been duly prepared, materially increased its vendibility and value. Foreign orders were given for it by the name of "sealed solder," and it was in special request in the East and West Indies, in France, and Austria. It was preferred throughout England, and little solder was made or sold except that sealed by the Plumbers' Company. The beadle, the report stated, was paid for his time and trouble, but the company exacted no fee for their seal. They only sealed for freemen of the guild. [The company did attempt, in 1832, to enforce their by-laws, but they were so "strictly construed" that it was found that practically they could not be enforced.]

The *Founders* possessed and still exercised functions similar to those of the Plumbers. To them was entrusted the "sizing and marking" of all manner of brass weights made or wrought within the City of London, or within three miles' compass thereof, or which should be sold or kept for sale within the said compass, together with the view and search of all brass weights and brass and copper goods whatsoever within such compass. These weights were all to be brought to the Hall to be sized and marked. All deceitful weights were destroyed. Witnesses on behalf of the company made the important statement that notwithstanding their jurisdiction only extended to the City of London and a limited radius round it, the weights stamped at their hall were generally circulated and used throughout the United Kingdom; and this had been the case for more than two centuries. [It may be added that weights intended for the colonies, and especially for India, are frequently stamped at Founders' Hall, owing to the extra care bestowed in "sizing." About 20,000 weights are stamped per annum upon an average.]

Science and Art Department, South Kensington.—The following is a list of the candidates who have been successful in obtaining Royal exhibitions of 50*l.* per annum each for three years, and free admission to the course of instruction at the following institutions:—1. *The Normal School of Science and Royal School of Mines, South Kensington and Jermyn-street, London:*—Thomas Mather, 24, pattern-maker, Manchester; Alfred Sutton, 21, engine-fitter, Brighton; William H. Littleton, 17, student, Bristol. 2. *The Royal College of Science, Dublin:*—Arthur Whitwell, 19, ex-pupil teacher, Nottingham; Frederick J. Willis, 18, student, Bristol; Christopher J. Whittaker, 21, pattern-maker, Accrington.

THE FOOD QUESTION.

WE have been paying for our fine July by a stormy August. Sinister predictions are everywhere heard as to the wheat crops, which a month ago were full of such golden hope. Our annual demand for wheat is from 24,000,000 to 25,000,000 quarters. Our imports for the last three years have averaged 6,700,000 tons of common flour, while our exports have been only 31,000 tons. Our own wheat crop this year is estimated at 9,500,000 quarters by Mr. James Caird, who adds that if we can reckon on a foreign supply equal to that of last year, and at not much over the same price, we shall be safe. Our payments for the last three years for imported corn and flour were,—59,000,000*l.* sterling in 1878; 61,250,000*l.* sterling in 1879; and nearly 63,000,000*l.* sterling in 1880.

SUNDERLAND BOARD SCHOOL COMPETITION.

AT a special meeting of the members of the Sunderland School Board, there were present, Messrs. R. Cameron (chairman), J. Stokoe, P. Wood, J. Kirk, T. W. Backhouse, M. W. Parrington, and the Rev. W. A. Walton, to receive the report of the General Purposes Committee on the plans for Stansfield-street School, Monkwearmouth, to accommodate 1,300 children, at a cost of 7,000*l.* Upwards of fifty plans were received in competition for the premiums offered by the Board. After a close contest between "Workable" and "I Work to Win," the committee finally recommended that the first premium be awarded to the plan bearing the motto "Workable," by Messrs. Rounthwaite & Shields, of Sunderland; the second to "I Work to Win," by Mr. G. G. Hoskins, of Darlington; and the third to "Study," by Mr. F. Clark, of Darlington.

It was decided, on the suggestion of Mr Wood, to exhibit the successful plans to the public in a room adjoining the Liberal Club.

PATENT RECORD.*

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending August 13, 1881.

3. E. Bull, Halifax. Floor-springs, or apparatus for closing doors.

A lever is connected to the bottom of the door, which stands on a socket joint. A chain is attached to the lever, the other end of which is connected to a spiral spring fixed underneath the floor. The chain passes between two friction-rollers. Jan. 1, 1881. Price 6d.

12. J. Craven, Wakefield. Drying and burning bricks, tiles, pottery, lime, cement, &c.

This has reference to that system in which the burning is effected by gas. In the centre of the kiln, between the two series of chambers, is the gas-main, with branch-pipes communicating with the chambers. At each side of the gas-generator is a chamber in which air is heated by the generator and is led to the burning chamber by flues which surround the gas-main and branch-pipes. The bricks, &c., are thus thoroughly dried by the hot air before the gas is turned on to burn them. Jan. 4, 1881. Price 8d.

46. E. F. Osborne, St. Paul, U.S.A. Steam and hot-water apparatus for supplying heat to and utilising, measuring, and regulating the same in dwelling-houses, &c.

This invention, which has thirty-two pages of specification and forty-eight clauses, illustrated by fifty figures in the drawings, is not capable of being condensed. Jan. 4, 1881. Price 1s. 8d.

112. J. Peer, Salford. Consuming smoke from fires.

The bottom of the firegrate is formed of bars of an I shape, so that when placed close together a number of passages for air are formed; which air is led behind the fireclay back of the grate, and through perforations formed in the same at the height of the top of the fire. These currents of air consume the smoke. (*Pro. Pro.*) Jan. 10, 1881. Price 2d.

Published during the Week ending August 20, 1881.

5,183. P. Bedeau, Paris. Manufacturing ornamental mouldings of carton-pierre, &c.

The mouldings are made of carton-pierre or other plastic material by circular moulding dies of electro-deposited metal. (*Pro. Pro.*) Dec. 11, 1880. Price 4d.

127. J. Stone, Ulverstone; T. Kirby, Barrow-in-Furness; and E. Phillips, Ulverstone. Revolving shutters.

The end of a roller is fitted with a chamber, which contains the lubricant, from which chamber a pipe is led to a hole in the end wall of the end, through which a small quantity of the lubricant escapes at each revolution. Friction-rollers working in helical or spiral grooves are also applied to the ends of the revolving shutter-shaft, to allow it to revolve with less friction. Jan. 11, 1881. Price 8d.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

130. W. Martin, Manchester. Pail for water or other closets.

The pail is fitted with a short tube at the bottom to draw off the liquid. To the outer end of this a flexible tube is attached, which leads to a trapped opening in the sewer. A lid is provided to the pail, which has a rim of india-rubber on the under side to make an air-tight joint. (*Pro. Pro.*) Jan. 11, 1881. Price 2d.

137. J. Reffitt & W. Irwin, Leeds. Apparatus for withdrawing and returning the plugs of urinals, closets, &c.

Two hollow receivers are mounted on frame-work, which is hung in bearings. Water being admitted to one of them, it flows through a tube to the other, which, when filled, overbalances the frame-work, and this latter receiver descends, lifting the plug at the same time. It is then emptied by a syphon, and the action is reversed, when the filling operation is again performed. This action is also applicable to flushing with a syphon, which may be connected to the framework instead of the plug. Jan. 12, 1881. Price 6d.

148. J. Friborg, Store-street. Venetian blinds.

The laths are connected by tape ladders. Screws which have the same number of threads as there are laths are placed vertically in the frame on each side. The ends of the laths are placed in the threads of these screws, and when these are turned, the laths are raised or lowered singly. (*Pro. Pro.*) Jan. 12, 1881. Price 2d.

158. L. A. Groth, Finsbury-pavement. Producing architectural ornaments in hollow relief from rag, wood, &c.

The rag or wood, &c., is reduced in hot water to a pulpy mass. Pulverised chalk, umber, or bone black may then be added. The mass is then formed in moulds to the shape required, and dried, when the articles are coated with any suitable varnish. Jan. 12, 1881. Price 2d.

164. J. Mellowes, Sheffield. Glazing roofs.

The roof consists of a series of rows of glass panes arranged in gradations, so that each row overhangs the row immediately below it. The panes at the upper ends enter a groove in the purlin. The lower ends rest on the top of the next purlin. The sides also rest in grooves in the bars of the framing. (*Pro. Pro.*) Jan. 12, 1881. Price 2d.

717. J. Woodward, Wolverhampton. Self-acting fastener for doors, windows, sashes, and frames.

This simplifies the action of spherical ball latches by making a cup, which is fixed to the bolt, and in which the ball seats itself. Feb. 19, 1881. Price 6d.

REGISTERED AND CERTIFICATED PLUMBERS.

REFERENCE has before been made by us to a new Plumbing Law which has been enacted in the United States, under which law no one will be allowed to work as a journeyman or master plumber unless he possesses a registration certificate, the possession of which will, it is thought, be some guarantee of competency. The *New York Sanitary Engineer* understands that the plan of plumbing to be adopted by the New York Board of Health will be presented to practical sanitary engineers, plumbers, and architects, at an early day, for their examination and advice. Meantime it publishes the regulations recently adopted at Washington, D.C., and Lawrence, Mass., as well as the forms for "registration" of plumbers adopted by the New York Board. The forms are as follow:—

Health Department,
New York, ... 188 .

Registration of Journeyman Plumber.

Under Chapter 450, Laws of 1881, and in compliance with the Rules and Regulations which have been established by the Board of Health, I, ——, a Journeyman Plumber, residing at No. —— street, do hereby register and make the following statement:—

That I am —— years of age, and served an apprenticeship of —— years with —— in the city of ——; that I have worked as a Journeyman —— years, and am now employed by —— doing business at —— street. And I hereby agree to comply with the Rules and Regulations that are and shall from time to time be established by the said Board of Health.

Signature.....

Health Department,
New York, ... 188 .

Registration of Master Plumber.

Under Chapter 450, Laws of 1881, and in compliance with the Rules and Regulations which have been established by the Board of Health, I, —— a Master Plumber, residing at No. —— street, and carrying on business at No. —— street, do hereby register and make the following statement:—

That I am —— years of age, and served an apprenticeship of —— years with —— in the city of ——; that I worked as a journeyman —— years, and have carried on the business as a Master Plumber —— years. And I agree to comply with the Rules and Regulations that are and shall from time to time be established by the said Board of Health.

Signature.....

The Brooklyn master plumbers contemplate calling a meeting to discuss the new law passed by the State Legislature conferring supervisory powers on the Board of Health in the matter of plumbing and drainage. Dr. Raymond, Sanitary Superintendent, says that every decent plumber would appreciate the new law. The only people who dislike it are builders of paste-board houses and plumbers who do cheap and unsatisfactory work.

The necessity of the adoption in this country of some such measures as have been taken in America was spoken of by Mr. Hellyer and by Professor Henry Robinson during the recent lectures on plumbing under the auspices of the National Health Society.

EASTBOURNE SANITARY EXHIBITION.

THE exhibition closed on Saturday, when there was a large attendance of visitors, who completely filled the large Pavilion as well as the annexe. In the afternoon Mr. E. Gregson Banner, C.E., lectured on "Sanitation and Ventilation." Dr. Ellis presided. The lecture was illustrated by models and diagrams. In the evening Mr. Isaac Shone lectured on "Defective and Effective Hydraulic and Pneumatic Drainage and Sewage Engineering." During the evening some experiments were made with Dick's patent fire *extincteur*. A large wooden structure, satnrated with tar and petroleum, was erected and ignited close to the annexe of the exhibition, and the rapidity with which it was extinguished by two small engines worked by Mr. Sinclair and Mr. Fuller was remarkable. After the closing of the exhibition an interesting presentation took place, a number of exhibitors having subscribed to present a combined testimonial to the secretary and treasurer. That presented to Mr. Schmidt, the treasurer, consisted of a silver tea-kettle, and that to Mr. Rodda, the secretary, of a mantelpiece clock, with pair of candelabra *en suite*. The presentation was made on behalf of the exhibitors by Mr. Councillor Hamilton, of Brighton.

The Awards.

The awards were announced during the day. The following are some of them:—

CERTIFICATES OF MERIT.—*In the Pavilion*:—Doulton & Co., Lambeth, fine art pottery, &c.; D. T. Bostel, Brighton, Bostel's patent tip-up lavatory basins, Hall's patented ventilator, and other sanitary appliances; J. A. Skinner, Eastbourne, valve-closets, &c.; F. G. Underhay, London, closets, pumps, well-frames, ball-valves, lavatories; Doulton & Co., Lambeth, water-waste preventers, baths and bath apparatus, sanitary appliances; W. H. Lascelles, London, red concrete window, paving and moulding slabs, and chimneypieces; Lincrusta Walton, new wall decoration, non-poisonous; The Silicate Paint Company, London, paints, enamels, &c.; Wilcock & Co., Leeds, glazed bricks, pottery, and sanitary apparatus; Doulton & Co., Lambeth, terra-cotta mantelpieces with patent fire apparatus; James Ed. Ellison, Leeds, conical perforated ventilating bricks and air-grates, valves, &c.; Papyrotile Company, London, the Papyrotile decoration; James Stiff & Sons, Lambeth, art stoneware, sewer air-traps, and terra-cotta, &c.; R. Boyle & Son, London and Glasgow, self-acting air-pump ventilators; Steven Bros. & Co., London, kitchen ranges and cooking apparatus; F. Fisher, Tunbridge Wells, electric bells, &c.; Chorlton & Dugdale, Manchester, mattresses and beds. *In the Annexe*:—George Jennings, Stangate, London, valve-closets and urinals; Charles Drake & Co. (Limited), Batterseas, concrete baths, floors, &c.; Spence's Metal Manufacturing Company, London, Spence's metal for jointing pipes, &c.; The Wilson Engineering Company, London, smoke-consuming stoves and ranges; Uriah Clark, Hellingly, Sussex, fancy and useful terra-cotta work, &c.; Frederick Edwards & Son, London, patent smoke-consuming slow-combustion grate; T. Constantine, London, smoke-consuming cooking range, and Dicks' patent fire-extinguisher; John Wright & Co., Birmingham and London, reflecting gas-cookers; Ritchie & Co., London, lighting and heating stoves; "Sunlight" Stove Co., Manchester, cooking stoves, baking and roasting apparatus; C. R. Stevens, Lewisham, patented steam and hot-air heaters; Sanitary Engineering and Ventilation Co., Westminster, scientific, sanitary, and domestic cisterns, &c.; A. Walker, Dulwich, concrete flooring, &c.; Jesse Pamphrey, Eastbourne, plaster models of houses; Bradford & Sons, Eastbourne, patent stoves and grates; William Sugg & Co., Westminster, lamps, burners, and ornamental globes, &c.; F. W. Reynolds, Blackfriars, London, portable steam-engines and mechanical tools; J. A. Skinner, Eastbourne, window-sashes, &c.; R. Adams, London, window-fasteners, sashes, &c.

HONOURABLE MENTION.—Thomas Bradford & Co., London, washing-machines; Robert R. Gibbs, Liverpool, boilers and furnaces; Gilmore & Clark, London, fire-alarms, ventilators, &c.; J. Jones & Sons, Bankside, London, boilers and coil cases; Manchester Water Meter Company, Ardwick, water-meters, &c.; E. Miray, London, sanitary appliances; S. Owen, London, baths and fittings; J. A. Skinner, Eastbourne, stoves, &c.; Webb's Worcester Tileries Co., Rainbow-hill, Worcester, for wood floor-blocks.

Mortuary for Kensington.—Mr. Reuben C. Green, solicitor, of Gray's Inn, applied at the Consistory Court on the 24th ult., on behalf of the churchwardens of St. Mary Abbotts, Kensington, for a faculty for the erection of a public mortuary upon part of the disused burial-ground adjoining the parish church. Mr. Churchwarden Bailey, Mr. R. Walker, architect, and Mr. R. Green, vestry clerk, were examined in support, and there being no opposition, the application was granted.

OBITUARY.

Mr. Chas. Lamb Kenney.—With much personal regret we record the death of this gentleman, which took place on the 26th ult. The son of the well-known dramatist James Kenney, and godson of one of even wider fame, Charles Lamb, himself accomplished, witty, and bright, Chas. Kenney took a position on the staff of the *Times* at nineteen as dramatic critic, and soon became recognised as a successful journalist and author. Later on he associated himself with M. Lesseps in the formation of the scheme for the Suez Canal, and then with Sir Joseph Paxton in some of his undertakings. He returned, however, to literature, and enjoyed a successful career, interrupted some years ago by an illness from which he never entirely recovered, and which in the end rendered continuous exertion almost impossible. His principal works are "The Gates of the East," the Biography of Balfe, the "Life and Letters of Balzac," and numberless operas and songs. He wrote the *libretti* of the "Grand Duchess," "Princess of Trebizonde," "La Belle Hélène," "Duck with 3 Beaks," and an English version of standard Italian operas published by a leading firm of music-sellers. In his early days his facility in the production of impromptu verse and epigrams was remarkable, and, indeed, continued to be so to the last in the intervals of ease which his malady afforded. He has left a widow, who had tended him with great devotion, and two children, one of whom, Miss Rosa Kenney, has given such promising evidence of ability as an actress that it is a matter for surprise that some leading London manager has not afforded her a fitting opportunity to display it further. The lamented death of her father, bringing to mind the good work he did in his time for actors and managers, as critic and dramatist, may lead to this desired result. We have not so many young ladies now on the stage capable of the supreme efforts required in the Shakspearian drama, that we can afford to neglect so promising an aspirant as Miss Kenney. The funeral took place at the Brompton Cemetery on Tuesday morning last. Besides the chief mourner, his son, Mr. Charles Horace Kenney, and various members of his family, a large number of friends had gathered to pay a last tribute of respect and affection, including Mr. George Rose, Mr. Sutherland-Edwards, Mr. Dion Boucicault, Mr. George Boucicault, Mrs. Alfred Mellon, Dr. Rice, Mr. Davison, Mr. Bosey, Mr. Aylmer-Gowing, Mr. S. Godwin, Mr. H. A. Nattali, Mr. Commissioner Hazlitt, Mr. George Coleman, and Mr. Charles Boyd. Mr. Kenney's resting-place is near to that of his late father, Mr. James Kenney, and his sister, the Baroness Mergey.

Mr. James Sandby Padley, County Surveyor for the division of Lindsey, Lincolnshire, died on the 18th ult., at Skegness. He was in his ninetieth year. He was a pupil of Captain Stevens, of the Royal Engineers, and assisted in the Ordnance Survey of Lincolnshire and the counties adjoining. In 1820 he was appointed county surveyor for the parts of Lindsey, a position which he held to the day of his death. During this period of fifty-eight years he constructed more than fifty bridges in various parts of the division. In 1826 he was appointed general surveyor to the Commissioners of Sewers acting at Lincoln, and continued to hold that office to the time of his death. In this capacity he carried out extensive improvements to the river Witham, and to the Langworth river, and he also designed and carried out the important work of the Torksey drainage, by means whereof the flood waters are pumped into the river Trent. He was surveyor to the Lincoln Turnpike Trustees for sixteen years. In 1875 he projected, in concert with Mr. Teague, engineer to the Lincoln Waterworks, the water supply to the town of Market Rasen. In 1842 he completed the survey, and published a map, of the city of Lincoln, which he revised in 1851, and again in 1868. In 1851 he published a work on the ancient monastic, ecclesiastical, and domestic edifices of Lincolnshire, illustrated with engravings, plans, and elevations of the buildings described.

Messrs. W. H. & L. Collingridge, of the *City Press*, announce the completion and occupation of their new buildings, 148 and 149, Aldersgate-street, which have been erected upon the site of the offices destroyed by fire in April of last year.

THE FULHAM SMALL-POX HOSPITAL.

FURTHER steps were taken last week, before a Divisional Court of the High Court of Justice, sitting in the Rolls Court, in the action that is now pending between Chambers and others against the Metropolitan Asylums Board for damages in the establishment, maintenance, and management of the Fulham Small-pox Hospital, and for its discontinuance. Already had the plaintiffs made application to the Court for an injunction to restrain the defendants from using the hospital for the reception of small-pox patients till the hearing of the case, but Mr. Justice Bowen, before whom the case came, adjourned the motion for injunction till the action came on for trial, and it was against this order that the plaintiffs now appealed.

After hearing the respective counsel, the Court suggested that the defendants might very well undertake not to send into the hospital any other patients than those coming from Fulham or from the adjacent parish, Hammersmith, till the hearing. In this arrangement Mr. Bompas (for plaintiffs) was willing to concur, but as Sir Hardinge Giffard, on the other side, was unable to enter into it without consulting the Local Government Board, time was given for this purpose; but as no action has since been taken, matters will remain as they are till the 5th of September, when a Divisional Court will sit to hear the case.

We need scarcely say that considerable interest, both local and external, is excited. It is time that the power of ruining a neighbourhood exercised by the Metropolitan Asylums Board should be curtailed.

The serious damage that has been occasioned to the owners of land and of house property, as well as to business interests generally in the vicinity of this hospital, is incalculable, and suggests that the effort to remove this plague-spot should receive more aid than strict *law* can give.

ARCHÆOLOGICAL SOCIETIES.

Yorkshire.—The members of the Yorkshire Archæological and Topographical Association went on an excursion to Helmsley and Rievaulx Abbey on Monday last, when the ruins of Helmsley Castle were described in a paper by Mr. G. T. Clark, Mr. J. T. Micklethwaite, F.S.A., discoursing upon the ruins at Rievaulx. Those who took part in the proceedings had put into their hands a well-written illustrated programme of the proceedings, which detailed the main historical facts in connexion with the places visited.

Somerset.—The annual meeting of the Somerset Archæological Society was held last week at Clevedon, under the presidency of Mr. Edmund H. Elton, who delivered an address. It is twenty-one years since the Society held its meeting in this part of the county. The report of the council showed the position of the Society to be satisfactory, and recommended the formation of a *Bibliotheca Somersetensis*,—a work which it was considered that the county should be no longer without. The vice-presidents were re-elected, with the addition of Dr. E. A. Freeman. The members subsequently visited Clevedon Court, at the invitation of Sir Arthur Elton, who read an interesting paper descriptive of the building. Proceeding to Yatton, they inspected the fine old prebendal church, dedicated to Saint Mary the Virgin. The church was described by Mr. B. Edmund Ferrey, Dr. Hardman, and Mr. E. Green. Subsequently a visit was paid to the Old Rectory, at Yatton. In the evening a meeting was held at the Public Hall for the reading and discussion of papers on subjects of local interest. Mr. C. E. Davis, F.S.A., gave a description of the recent Roman discoveries in Bath. He explained that the hot-water springs of Bath were utilised by the Romans for bathing to a considerable extent, but until the year 1750 all that was known of the hot springs was merely the sort of reservoir into which the water came from the bowels of the earth, and until that time that was the only part of the baths used for bathing. In 1755 some excavations were made near the abbey, and the result was the discovery of a large system of baths, and in consequence of the excavations which he had recently made at the expense of the Corporation he had been enabled to make a correct plan of them. In 1871 he found a large Roman drain, and by clearing out this they were enabled to carry the excavations to a greater depth, and the result was that they discovered recently a large bath 80 ft. long and 40 ft. wide within a large hall exceeding 120 ft. in length. Subscriptions were started with the object of clearing the baths, which were built of the most massive masonry, and making them available for the public. The excavations had revealed the fact that these baths occupied about one-fourth of the ancient city of Bath.——Mr. Jerom Murch said not only the citizens of Bath, but the archæologists of Somersetshire, were much indebted to Mr. Davis for the interesting discoveries he had made. They had not been made by Mr. Davis in consequence of any precise commission given him by the Corporation, but they were made by him month after month as the result of untiring energy and hard work, pursued oftentimes in the face of much discouragement. Some idea of the extent of these baths would be formed when it was stated that they were four times the size of the abbey. When this great work was completed, and the whole area was thrown open, as he hoped it would be, they of the present generation would be able to form a fair idea of the magnificent baths which the Romans constructed in the city of Rome itself. Prebendary Scarth considered this one of the most remarkable discoveries yet made. On the second day there was an excursion to Tickenham, Wraxall, and Ashton Court. On the return journey, Long Ashton Church, Flax Bourton Church, and Backwell Church were visited, Mr. Ferrey describing the architectural features of each.

THE VERGERS OF YORK MINSTER.

THE Very Rev. the Dean has allowed his choler to obscure his logical faculty. He says he has from time to time received anonymous imputations concerning the vergers. What is this but acknowledging that hosts of others have been stirred, like myself, to indignation and complaint? But he dismisses them with the stereotyped and conventional formula of mechanical thought: "I have treated them with the contempt such communications deserve." Had he said "This is the first time I have heard any remark about the vergers," there would have been some excuse for the warmth of the epithets he applies to me and the other complainants; but, as it is, there cannot be, to any reasoning mind, a stronger illustration of the French adage, "*qui s'excuse s'accuse.*" He then says that the visitors to York Minster are of "various degrees of intelligence, and it must be very difficult to give information which shall be equally acceptable"; *ergo*, the vergers are to persevere in doling out that of a very low, and in the cases quoted by me, offensive standard. The Dean adds that I do not "give any clue to my mental capacity." Perhaps this will satisfy him. I desire to visit a cathedral under this condition. I do not object to make a liberal contribution, but I desire to be left alone to make my own inspection, my own observations, my own reflections, without the obtrusion of an illiterate and would-be facetious verger. This privilege has been accorded for some time at Peterborough and Winchester, without any damage to anything but the "tips" to the vergers. If this desire is an evidence of a poor and mean intellectual capacity, it is shared by thousands who have visited those cathedrals and gratefully acknowledged the concession.

I do not wish to offend the feelings of the friends of the Dean, or to gauge their mental capacity, but I cannot help thinking they must be blessed with the possession of an immense amount of politeness; for I do not understand how they could return to the deanery and acknowledge the "interesting information" imparted to them, if it was of such a character as that vouchsafed to me and twenty others by the Dean's pet verger.

The Dean then speaks of "the complex and difficult duties" of the vergers. I thought their functions were to open the doors of the stalls of the Dean and Canons, and to show the congregation to their seats. Is this part of their duty complex or difficult? Or is it both? Does the performance of it entail such a mental strain that when they address themselves to the other portion, that of receiving the sixpences and showing the visitors over the edifice, they are obliged to seek relaxation in being vulgar and trying to be funny? But the Dean says this is "frivolous and cowardly," so I very humbly apologise to him. If I can find courage I will make an *auto-da-fé* of my Britton, my Willis, and even the little guide-book to the minster. I will invoke Murray, not, as he is about to do, to publish a fresh edition of his Yorkshire, or, at least, to omit that part pertaining to the cathedral; and should I again visit that sacred edifice, I will endeavour to listen with the most profound attention to the "complex and difficult" verger. I cannot expect, after the infamous conduct of which I have been guilty, to be invited to the deanery, but I will make every effort, like the Dean's friends, to express "an approval of the information imparted," specimens of which will be found in the *Builder* of August 13th.

F. S. A.

ST. MARGARET'S WESTMINSTER.

SIR,—Every true artist and lover of the really picturesque and beautiful will agree with you that it would be an act of the greatest Vandalism to destroy St. Margaret's Church. It only hides a small portion of the Abbey as seen from one side, and then not only serves to show off and assist the grand proportions of the latter, but unites with it to make a grouping of extreme beauty. Indeed, the Abbey would lose much of its venerable and historic appearance by the demolition of any of its Mediæval surroundings.

Unfortunately, only too many of the finest churches in Europe have lost a great part of their interest by the pulling down of all the contemporary buildings about them. Milan Cathedral, for instance, is now utterly dwarfed and disfigured by the erection of a gigantic quadrangle of "Renascence" houses all round, thus giving it the appearance of an imitation Gothic church in a London square.

Looking towards Westminster Abbey from Victoria-street, the harmonious group of Gothic buildings forms one of the most striking and splendid *coups d'œil* in the world, and one which would be greatly deteriorated by the abstraction of St. Margaret's; while, looking from Parliament-street, the large trees on the north side of St. Margaret's conceal nearly the whole of what itself covers of the Abbey, so that it would be necessary to cut these down also before the object desired by the advocates of the demolition could be attained.

What really does conceal the Abbey without providing any compensation in the form of its own beauty, is the hideous block of buildings flanking Abingdon-street, and if money is to be spent in improving the precincts of Westminster Abbey, it should not be by destroying the pretty little church with so many historic associations, but by pulling down such obtrusive and vulgar edifices as these and the Aquarium.

EVACUSTES.

THE WORD "NATURE" IN ART-DISCUSSIONS.

SIR,—The misuse of the word "nature" has vitiated most of the art-discussion for the last five-and-twenty years past. The word "nature" has so many connotations that when it is used in reference to art questions it is not noticed that it is being used at one time as implying one thing and at another something entirely different. Sometimes "nature" includes all that is possible to be, the universe; at others, "nature" means only that part of nature which is not man, and which is unsophisticated by man; and in yet another sense "nature" means only that which is right in human and other nature.

Now, art-discussion would be more fruitful of practical advantage if we would but determine to use the word "nature" in that first signification, namely, as including all that is possible to be, and then writers would not have to apologise for thinking, as Mr. Colling does in his letter to the *Builder* of the 28th ult., that the "mathematics and geometry are closely allied to laws which exist in nature." Why, of course they are,—they are a part of nature; they are an exposition of the relations of quantity and configuration in nature; they are not evolved out of man's inner consciousness, but are founded on his experiences of being. But nature includes both symmetry and irregularity, well-being and ill-being, right and wrong. It is not, then, a sufficient reason that anything should be adopted in art because it exists in nature; we have to show why one form of nature should be adopted in preference to another,—that such and such a treatment is better for our human well-being, our taste, than another. It is on this ground that the argument for the regular or the irregular should be fought out. I could, of course, enter into the argument concerning the geometrical on this

ground, but it is of no use discussing any art-topic till there is a complete understanding about the use of the word "nature." It should, however, be recollected that geometry does not deal with the regular alone. Regularity and irregularity are two extremes, between which nature, art included, is always striving to steer a middle course. W. Cave Thomas.

CONDITION OF FAREHAM.

Sir,—Permit me a little of your valuable space to vindicate my report of the deplorable sanitary arrangements of Fareham, portions of which you remarked upon in your edition of the 20th inst.

No denial of my charges has been given in the letter of the Fareham Local Board to you. It is a "hornets' nest" I have stirred up,—a very unfragrant one,—and if the Fareham Local Board wished to keep secret and continue their present sanitary system they could not have done worse than to write to you the letter of August 27; for, firstly, my *exposé* of the dangerous contamination of the water supply through the closets being directly connected therewith without the intervention of an intermediate tank, is admitted. Intermittent water supply is also admitted, though if there were constant supply it would be but a very weak defence against the ingress of sewage gas, and, as I will presently show, of something worse. The Board admit the water is turned off from ten p.m. to six a.m., and it is also turned off Sundays from six p.m. to eight p.m., and in the hot seasons at other hours, and, of course, at all seasons occasionally for special purposes. The purity of the water when it starts from the works is mentioned in my first letter, and it is the more grievous that so rare a blessing should be wilfully spoiled by its guardians; and the repetition of my testimony by the Fareham Local Board, as an answer to my charge, is remarkable. Now, to further illustrate the dreadful evil. A closet on the said objectionable principle, attached to a large house in the West-street, not long since became choked, and the "exhaust" was even allowed to fill the pan and actually ran into the water-pipe, and, percolating through the service, the horrid mixture was actually drawn from the taps in the house, and, consequently, must have been supplied to adjoining houses. Imagine the result had cholera or other deadly epidemic been in the house! I suppose no high sanitary authority is needed to tell us that it would have been at once spread over the entire area contaminated by the said closet, and even the whole water service of the town itself might have been thus impregnated with the germs of fatal disease. It may be said this is an extreme case; but on inquiry I find that in cottage closets and with untidy tenants it must often occur. Comment is needless, save, perhaps, recording publicly that nothing but insulating all closets from the water supply, by intermediate tanks or cisterns, will protect the town from some frightful epidemic, always now threatening it.

You are told regarding my second charge, that "the effluent water, after filtration and deodorisation, pass into salt-water mules away from Portsmouth." Now mules away from Portsmouth brings it (the sewage of 6,000 people) where I described it, viz., on the shore of Fareham quays and town. I assert that nothing worthy of the name of filtration or deodorisation is effected. Why do not the Fareham Local Board state the deodorising means and material used; and what *they* understand by "filtered"? The fact is, that there is practically no filtration or deodorisation whatever, as flint stones are the only material used. There are small tanks at the outfalls into which the sewage passes at one end, and out at the other direct into the Channel when the tide recedes. The solid matter which deposits itself *voluntarily* at the bottom of the tanks is removed at the convenience of the contractor, and at irregular intervals of about six months. But all that is offensive and poisonous in the sewage still is vomited forth after every tide, close under the shore which bounds the lower part of the town, and wends its way down the Channel into the harbour, most of it to varnish her Majesty's numerous shipping, and swelter in the summer sun (when we have any), and the rest, opposed by the returning tide, heads back up the Channel, and, wearied by its first voyage, sticks permanently to the Fareham mudbanks, and twenty years of tidal sewage deposits have left the acres verging the Channel leading from Fareham to Portsmouth Harbour the stinking pestiferous region it is.

And the sewers. I state positively that cellars are flooded from the sewers in the chief street, notably those of a leading hotel, of a large bakery, and of the former residence of two leading townsmen, referred to in my letter to a local paper. The current denial given is inexplicable in the face of facts; and I know that, in connecting the drain of a block of houses lately, the main sewer was found full of gravel and mud, and stagnant water. To make even a nominal connexion a bend was used, entering the sewer vertically. Perhaps some allusion, in boasting of the "filtration system," was meant to the "flushing tanks" at two or three points in the town. Perhaps not, for they are simply pits capable of being filled with water and then let out suddenly into sewers. Contents are not otherwise removed, and the Fareham Local Board tells us how incapable the sewers are of dealing with a sudden rush of liquid. *Apropos des bottes*, let me relate that once some nasty person deposited a lot of night-soil at a frequented corner of the town. The nuisance at once appealed to the sanitary reverberations of the Fareham Local Board, who immediately dashed a lot of fresh lime on the fetid mass. Result? "Foul, sour gases from the release of gases in the fatty deposit." Sanitary science has not here reached the stage as the modern "Noah" in the study of the wonderful deodorising powers of simple soil.

A few words only on the rest of the Fareham Local Board's protest. As to the churchyard, after burying 100 bodies per annum for seven years since it was reported virtually full, the echoes have, towards providing a cemetery, only now reached the stage of "being in correspondence." I fear pen and ink will not buy ground or build cemetery buildings and 12 ft. high retaining walls, &c., &c. It takes a lot of money now to satisfy the ever-increasing requirements of the authorities. Nor is any comfort to be had, even remotely, that the sanitary rate is high, when it is known it would be much higher and worse, but have been long spent, seeing the results described. A word more in letter in your columns to tell us that we are to have rates and sewer rate in peace? And why in the last seven Local Board not add new rent-free lands there, too, so have meagre returns for our money. Also "Fareham is in directories." Nothing like facts. As to how Fareham is "reputed," the public will now read for themselves and wonder. Happily, no epidemic. No; but how soon will the vile state of affairs permit our escape? Two or three closets such as described, an unhealthy season, a match applied, in the shape of imported epidemic, to the magazine of evils quite ready to explode, then *exeunt omnes*. Personally, I and others fervently hope the "happily" will last a little longer, till we can get clear of the unnaturally poisoned atmosphere and water supply, and the piled up corpse ground of this *naturally* nice town.

I am ready to subscribe a guinea to a fund to pay an expert, nominated by you, to report as to the truth or falsehood of my strictures. Quæstor.

Books.

Practical Ventilation and Warming, with Illustrations and Examples. By Joseph Constantine, Manchester. London: J. & A. Churchill, 1881.

The special feature of Mr. Constantine's book is that it describes and illustrates the mode of heating and ventilation actually adopted in various public buildings, such as the Pentonville Prison, Free Trade Hall, Manchester, Manchester Royal Exchange, a concert-hall, and so on. It gives suggestions, too, on the construction and heating of disinfecting rooms and Turkish baths, and we have no hesitation in pointing it out as a useful contribution to the existing means of obtaining knowledge in respect of subjects the importance of which is more recognised every day.

Handbook for the Cathedral Church of St. Fin Barre, Cork. By Richard Caulfield, LL.D. Cork: Purcell & Co. 1881.

Dr. Caulfield was the honorary secretary to the committee for rebuilding the Cathedral of St. Fin Barre, and has prefaced his excellent little guide with a pithy, yet comprehensive, sketch of the early history of the site and the proceedings which led to the erection of the present building from the designs and under the loving care of the late William Burges, architect. Our early volumes contain illustrations and particulars of this cathedral, which must be regarded as its architect's chief monument. His design, it will be remembered, was selected in competition, and about 100,000*l.* have been spent upon it, leaving many of the intended decorations and some of the furniture yet unsupplied; the designs, however, were all made, and are in the hands of the authorities. So much of the carving and other work is symbolical, and so many of the windows and fittings are erected as memorials of individuals, that half the pleasure derivable from a visit to it would be lost without a proper guide-book, and this, Dr. Caulfield, in fulfilment of a promise made to the late Bishop and to Mr. Burges, has admirably supplied. It includes a plan and other illustrations, and describes pithily every portion of the building. The stained-glass windows, of which there are many, were all executed by Messrs. Saunders & Co., the cartoons throughout being made by Mr. H. W. Lonsdale, with the exception of those for the three choir clearstory windows supplied by Mr. F. Weekes.

VARIORUM.

The third edition of "The House Owner's Estimator: or, What will it Cost to Build, Alter, or Repair" (Crosby Lockwood & Co.) is edited by Mr. Fredk. T. W. Miller, A.R.I.B.A., and contains additional prices and information. It is not unusual to hear a house-owner say, "I wonder what it would cost to put in a bow-window," or "What would be the expense of another story." The object of this little book is to afford, broadly, an answer to such questions, and it contains much other information useful to owners and occupiers.——We ought to have mentioned before now that a third edition has been published of "Metropolitan Rating," by Edward Ryde and Arthur Lyon Ryde. It consists of a summary of appeals heard before the Court of General Assessment Sessions, with a synopsis of the "Valuation (Metropolis) Act, 1869," and is an absolutely necessary book for surveyors and valuers.——The new number of the *Nineteenth Century* gives evidence of the open eye which Mr. Jas. Knowles keeps on the progress of events, and the success with which he makes his Review present a discussion of current questions. Thus, to mention but a few of the heads, the Deadlock in the House of Commons is commented on by Mr. F. Harrison, Bread Reform by Miss Bevington, *Scrutin de Listo* by M. Reinach, the Workman's View of Fair Trade by Mr. Geo. Potter, and France and North Africa by the Earl de la Warr. None will read it carefully without gain.

Miscellanea.

St. James's Church, Paddington.—In the Consistory Court, before Dr. Tristram, Chancellor of London, application has been made by the vicar (the Rev. W. Abbott) and churchwardens of St. James's district parish church, Westbourne-terrace, for a faculty to reconstruct the body of the church, at an expense of 15,000*l.*, according to plans prepared by Mr. Street, R.A. Objection was taken to the granting of the faculty on the ground, firstly, that the proposed outlay was extravagant, and secondly, that by the proposed reconstruction there would be a decrease in the number of the sittings. The Chancellor, in giving judgment, said that Mr. Street had proposed to add to the width of the church, and to erect galleries, which would increase the sittings to nearly the original number. But the additions were not on the plan as filed and submitted to the Bishop of London, and, therefore, in his opinion, there should be a supplemental petition and an amended citation issued before he could grant the faculty. He knew there could be an appeal, but he hoped that those who opposed the granting of the faculty would consider what he had said. If there was no further opposition, the work could proceed during the present vacation, and be finished by the end of the vacation next year. The learned Chancellor said he should see the Bishop of London on the point he had stated, and if, in a week after the citation was published, there was no further objection, the faculty would be issued, and the works could be commenced. Order accordingly.

Termination of the Strike in the Wrought-iron Nail Trade.—An adjourned conference of wrought-iron nail manufacturers of the Birmingham, Dudley, Halesowen, Sedgley, and Old Hill districts was held at Birmingham, to consider the demands of the men on strike for the restoration of the 1879 list. The operatives originally struck for an advance of 30 per cent., but they modified their demands to the 1879 list, which is about 25 per cent. below the list of 1875. During the past twelvemonths, however, the nailers have been paid about 25 per cent. less than the 1879 list, and they accordingly went out on strike about two months ago to the number of nearly 30,000. About 2,000 have returned to work at the advance, but the remainder were still out pending the decision of the meeting. After a lengthy discussion, it was resolved, on the motion of Mr. Perry, seconded by Mr. Russell, "That the demands of the workmen be conceded, and the 1879 list be paid in future." The decision was communicated to Mr. John Price, the leader of the operatives.

The City Church and Churchyard Protection Society.—A special meeting of the Council of the City Church and Churchyard Protection Society, presided over by Mr. J. Clarke Mould, was held to receive the report of Mr. Henry Wright, honorary secretary, on the proposed destruction of St. Matthew's, Friday-street, a church with a good congregation at both Sunday services, the rector of which is the succentor and a minor canon of St. Paul's Cathedral, Dr. Sparrow Simpson. The following resolution, proposed by Mr. G. H. Birch, A.R.I.B.A., and seconded by Mr. Bowes A. Paice, A.R.I.B.A., was unanimously carried:—

"That the Council of the City Church and Churchyard Protection Society, whilst admitting there may be no special beauty in the church of St. Matthew, Friday-street, yet consider that every opposition should be offered to its proposed destruction, both from principle and on account of many of the provisions in the scheme for the Union of Benefices."

An Unfounded Imputation.—Mr. G. F. Lyster, the respected engineer to the Mersey Docks and Harbour Board, on Saturday last, in the Liverpool City Police Court, appeared in support of a summons for libel taken out by him against the printer and publisher of a weekly publication called the *Wasp*. It seems that in the number for July 30, the following words were printed, under the head of "Answers to Correspondents":—"Jerry.—We do not know what commission the Dock Board Engineer gets from the cement-makers." It was admitted by the defendant that he had no ground whatever for the grave imputation which these words conveyed, and that they were, in fact, merely a "joke,"(!) no correspondent having asked for information on the subject. Mr. Lyster formally testified as to the absence of any foundation for the statement made. Subsequently, an apology was tendered and accepted, and Mr. Lyster withdrew the summons.

Land Reclamation in Ireland.—The Commissioners of Public Works, Ireland, have just issued their consolidated award for the repayment of the loan obtained from Government for the Upper Inny drainage works. More than 11,000 acres are included in the award as having been saved from the injurious effects of flood waters, but the quantity of land actually benefited far exceeds 11,000 acres, because the lands surrounding the 11,000 acres are now relieved from the injury they formerly sustained by their proximity to the 11,000 acres of flooded land now drained. The works, which now extend along eighty miles of rivers and tributaries, passing through four counties, are the largest yet completed under the General Drainage Act of 1863, including the erection of many public road bridges of large span, the erection of weirs and sluices, together with two large self-acting regulating weirs, the first of the kind tried, and presenting many novel features for the control of the flood-waters. The works were designed and carried out under the direction of the chief engineer, Mr. James Dillon, M. Inst. C.E., of London and Dublin.

Improvements at Hastings.—Mr. Charles H. Cooke, the architect to the Royal National Lifeboat Institution, visited Hastings a few days ago, and conferred with Mr. William Andrews, the borough surveyor, with respect to the extension of the sea-wall, opposite the site of the proposed new lifeboat house in the Fish-market, which is to occupy the site of the old Custom-house lately washed away owing to the defective character of the foundations. It has been decided to extend the sea-wall 52 ft. to the eastward in its present line, and as soon as this has been completed, the erection of the lifeboat house will be proceeded with, from the designs of Mr. Cooke. Workmen are now engaged in underpinning the wall to the eastward of the groyne near the site, and when this is accomplished the wall will be extended.

"A Nice Mess."—According to returns furnished by the engineer of the Metropolitan Board of Works, the average daily quantity of sewage pumped into the river Thames is 318,169 cubic mètres at Crossness, and 426,686 cubic mètres at Barking, equivalent to about as many tons by weight.

"Bold-street, Liverpool."—Referring to the notice, under this heading in our last issue, of Messrs. Van Gruisen's premises, Messrs. Clark, Bunnett, & Co., write to say that the wrought-iron grilles and gates were manufactured, supplied, and fixed by them, as well as the hand-power lift.

Artisans' and Labourers' Dwellings.—The site of Peartree-court, situate between Clerkenwell-close and Farringdon-road, has been purchased by the Peabody trustees for the purpose of erecting dwellings under the Artisans' and Labourers' Dwellings Act.

Melbourne International Exhibition, 1880-81.—A desire has been expressed to present a supplemental testimonial to Sir Herbert Sandford, and a committee is being formed to make the necessary arrangements.

The Architectural Association has just had its twelfth annual excursion, Worcester and its neighbourhood having been the locality chosen. The excursion was carried out in accordance with the programme.

TENDERS

For new premises and alterations to Hall, Harp-lane, Great Tower-street, for the Worshipful Company of Bakers. Messrs. Clarke & Shoppee, architects. Messrs. S. Young & C. H. Shoppee, surveyors. Quantities supplied:—

Macey & Sons	£11,835 0 0
Stimpson & Co.	11,833 0 0
Patman & Fotheringham	11,650 0 0
Higgs & Hill	11,477 0 0
Scrivener & Co.	11,438 0 0
Clark & Bracey	11,239 0 0
Langmead & Way	11,190 0 0
L. H. & R. Roberts	11,137 0 0
Geo. Smith & Co.	11,072 0 0
M. Manley	10,942 0 0
Stephens & Bastow, Bristol	10,889 0 0
W. Brass	10,603 0 0
E. Lawrance	10,485 0 0

For rebuilding Nos. 19, 20, and 21, Old Bond-street. Mr. T. T. Wimperis, architect. Quantities by Mr. Hilton:—

Simpson	£16,451 0 0
Clark & Manoocb	15,590 0 0
Aldin & Son	15,390 0 0
Thorn	15,320 0 0
Brass	14,702 0 0
Fish	14,700 0 0
Bywaters	14,431 0 0
Patrick & Son	14,425 0 0
Scrivener & Co.	14,397 0 0
Macey	14,396 0 0
Langmead & Way	14,200 0 0
McLachlan & Sons	13,984 0 0

For road and sewer works on the Leytonstone-road Estate, for the United Land Company (Limited):—

W. Porter	£2,684 11 7
A. Walker	2,649 0 0
Nowell & Robson	2,500 0 0
H. Holloway	2,487 0 0
Bottoms Bros.	2,453 0 0
J. Cardus	2,450 0 0
T. Rowley	2,400 4 2
G. White	2,350 0 0
Wilkes & Co.	2,347 0 0
C. Killingback	2,333 0 0
J. G. B. Marshall	2,289 0 0
G. Hunter	2,286 0 0
M. W. Rowles	2,247 0 0
W. J. Botterill	2,223 0 0
John Jackson	2,222 0 0
E. Wilson	2,200 0 0
D. Knight	2,198 0 0
J. Pizzey	2,187 10 0
J. Ball	2,162 16 5
W. West	2,156 0 0
J. Stockwell	2,107 0 0
T. Huntley	2,070 18 7
G. Felton	2,048 0 0
T. Spurgeon	2,039 15 0
W. G. Harris	2,019 0 0
G. Impey	2,010 0 0
J. Bloomfield	2,009 0 0
A. Nicholls	2,000 0 0
J. G. Truman	1,999 0 0
Ford & Everett	1,974 0 0
Beadle Bros.	1,731 0 0
Jesse Jackson (accepted)	1,725 0 0

For the erection of houses at Langley Park, Sutton, for Mr. J. L. Plumbridge. Mr. Alex. R. Stenning, architect. Quantities supplied:—

	One House.	Five Houses.	Picked Stocks.
R. P. Barnes, Chiswick	£1,940	£9,400	£9,300
J. Jesl, Epsom	1,786	8,9.0	8,950
Young, Cochrane, & Co. Kennington	1,750	8,700	8,470
Watson & Dennott, Dulwich	1,658	7,900	7,750
Bottom Bros., Battersea	1,486	7,400	7,550
Vernon & Ewens, Watmnstr.	1,500	7,118	7,000
M. N. Rowles, Acton	1,382	6,862	6,862
W. Crockett, St. Pancras	1,400	6,825	6,625
W. Hobern & Co. New Kent-road	1,200	5,995	5,950
A. Porter, Waltham	1,187	5,9'0	5,800
J. D. Brutton & Son	1,214	5,570	5,545
Howe & White, Wallington	1,095	5,15)	5,400
G. Avis & Co. Peckham	1,005	5,375	5,325
B. J. Humphris, Sutton	1,110	4,880	4,810
Smith & Bullied, Croydon (too late)	1,666	8,330	—
J. Warr, Croydon (too late)	1,364	6,779	6,769

For the erection of a house at Bromley, Kent, for Mr. A. E. Willett. Quantities by Mr. W. B. Brown. Mr. Alex. R. Stenning, architect:—

S. J. Jerrard, Lewisham	£3,343 0 0
J. C. Arnaud, Bromley	3,552 0 0
Syme & Duncan, Beckenham	3,500 0 0
S. Sabey & Son, London	3,393 0 0
S. Crossley, Bromley	3,389 0 0

For the erection of a house at Bromley, Kent, for Mr. C. Nickalls. Quantities by Mr. W. B. Brown. Mr. Alex. R. Stenning, architect:—

S. J. Jerrard, Lewisham	£3,143 0 0
J. C. Arnaud, Bromley	3,987 0 0
Syme & Duncan, Beckenham	3,850 0 0
T. Crossley, Bromley	3,688 0 0
S. Sabey & Son, London	3,664 0 0

For building a new lodging-house in rear of 90, Camberwell-road, for Mr. Lee. Mr. St. Pierre Harris, architect:—

	Lodging-house.	Covered Way.
Taylor & Son	£3,889	£10 0 0
Hainsman	3,867	22 19 6
G. & S. Fisher	3,375	16 0 0
Grover	3,348	17 0 0
Eldridge & Gee	3,093	17 0 0
Taylor & Parfitt (accepted)	2,993	18 0 0

For repairs and painting at the Wapping Charity Schools, for the Trustees. Mr. F. J. Westley, architect:—

Taylor & Parfitt, accepted.

For the restoration of the parish church, St. Deverux, near Hereford. Mr. Wm. Chciake, architect:—

	Design A.	Design B.
Pearson & Son, Ross	£1,250	£1,051
King, Gloucester	1,187	937
W. Cullis, Hereford	1,100	800
W. Birrell, Shrewsbury	1,072	872
Huckson & Warwick, Hereford	847	700

For erection of farmhouse, &c., at Farnborough, for Sir J. Lubbock, bart., M.P. Messrs. Baxter, Payne, & Lepper, architects:—

Taylor & Son (accepted).

For new house, stables, and conservatory, Totteridge-road, High Wycombe, Bucks, for Mr. D. Clarke. Mr. Arthur Vernon, architect. Quantities by Mr. Walter L. Vernon:—

Woodbridge	£2,061 0 0
Taylor & Grist	2,026 10 0
J. Holland	1,950 0 0
Silver & Son	1,942 10 0
Loosley	1,854 16 0
Cooper	1,813 0 6
Gibson	1,785 10 2
Corby	1,555 0 0
Hunt	1,539 0 0

For the erection of a detached residence upon the Castlebar Estate, Ealing, for Mr. George Penn. Mr. Walter Graves, architect. No quantities:—

Fanny & Durant, Ealing (accepted) £1,510 0 0

For repairs to four detached residences on the Sidcup Park estate, Kent, for Mr. Robert Upperton. Mr. Walter Graves, architect:—

Bolding (accepted) £243 0 0

For road and sewers, Lavender Sweep Estate, Clapham-common. Mr. W. Newton Dunn, architect:—

C. Peacock	£2,173 0 0
R. & G. Neal	1,625 0 0
James Neal (exclusive of bushes)	1,600 0 0
A. & J. Blake	1,612 0 0
John Ball	1,435 0 0

For alterations and additions to No. 7, Ely-place, Holborn, for Mr. George Reader. Mr. Rowland Plumbe architect:—

Howard & Dorrell	£1,235 0 0
Pink & Son	1,095 0 0
Wm. Downs	1,037 0 0
Dearing & Son (accepted)	995 0 0

For alterations and additions to 11, St. Andrew's-place, Regent's Park, for Mr. W. Gilbey. Mr. Arthur Vernon, architect:—

Bird	£5,496 0 0
Wagstaff & Son	5,121 0 0
Holland & Hannen	4,976 0 0
R. Perkins	4,690 0 0

For house and studio at Netherhall-terrace, Finchley-road, for Mr. T. Davidson. Messrs. Batterbury & Huxley, architects:—

M. Manley	£4,759 0 0
Ashby Bros. (too late)	4,730 0 0
Brass	4,725 0 0
Langmead & Way	4,694 0 0
Lathey Bros.	4,690 0 0
Nightingale	4,658 0 0
Holliday, jun., Brixton (accepted)	4,465 0 0

For forming roads and paths, and laying-in drains on the Belvedere Park Estate, Mount-pleasant, Tunbridge Wells, for Mr. A. D. Thomson. Messrs. Batterbury & Huxley, surveyors:—

Neave & Son	£2,247 0 0
W. Bayliss	2,037 16 4
Willicombe & Oakley	1,733 15 0
Killingback	1,689 0 0
Strange & Sons	1,659 0 0
Potter, Clapton (accepted)	1,647 0 0

For alterations and additions, Manchester-terrace, Kilburn. Mr. Geo. Edwards, architect. Quantities by Mr. H. Lovegrove:—

Richardson	£1,595 0 0
Dainton	1,525 0 0
Tobury	1,490 0 0
Martin, Wells, & Co.	1,449 0 0
Barnett	1,397 0 0
Canning & Mullins	1,322 0 0
Goad	1,315 0 0
Tarrant	1,300 0 0
Scrivener	1,297 0 0
Green	1,257 0 0
Hickinbotham	1,225 0 0

For alterations, No. 61, Brompton-road. Mr. George Edwards, architect. Quantities by Mr. H. Lovegrove:—

Matthews	£494 0 0
Richardson	485 0 0
Martin, Wells, & Co.	446 0 0
Williams	410 0 0
Tims	389 0 0
Stimpson	373 0 0
Green	387 0 0
Craske	350 0 0

For rebuilding the church of St. James, Paddington. Mr. G. E. Street, architect. Mr. J. Gandy, surveyor. Quantities supplied:—

Wheeler, Highgate	£17,419 0 0
Dove Bros., Islington	14,895 0 0
Stephens & Bastow, Bristol	14,143 0 0
Lovatt, Wolverhampton	14,112 0 0
Booth & Son	13,700 0 0
Goddard & Sons, Farnham	13,179 0 0

For new roofing and other alterations to stabling, a Trevor Hall, Ruabon. Mr. George Canning Richardson architect:—

	Covered with Roofing Tiles.	Allow for old Materials.
Evans & Morris	£340 0 0	£12 0 0
Huxley	330 0 0	20 0 0
Owen	310 0 0	25 0 0
Jenkins & Jones	242 0 0	3 15 0
Jones & Owens	230 0 0	4 0 0
Watkin Jones	210 10 0	6 0 0

For farm-house and homestead, Maids Moreton, Bucks Mr. Robert Hutchinson, architect:—

Hawkins	£1,673 0 0
Brown & Cooper	1,731 0 0
Tibbets	1,680 0 0
T. Few	1,613 0 0
Marshall & Boyse	1,598 0 0
Wade & Edey	1,597 0 0
J. Munday	1,536 0 0
A. Bunting	1,519 0 0

For new county police-station, Huntingdon. Mr. Robert Hutchinson, County Surveyor, architect:—

J. Francis	£1,684 0 0
A. Bunting	1,616 0 0
J. Saint	1,605 0 0
Wm. Osborne	1,514 0 0
Wm. Coates	1,500 0 0
Geo. Thackray	1,487 0 0
J. Howard	1,486 0 0
Geo. Richardson	1,441 0 0
Chas. Lord	1,430 0 0
Wm. Balmer	1,411 0 0
Wade & Edey	1,370 0 0

For alterations and additions to Upper Holloway Baptist Chapel, Holloway-road, Messrs. Searle, Son, & Hayes, architects:—

		Extra if Stone Facings.
Southcott & Co.	£2,183	£110
W. Bamford	2,181	115
W. Goodman	2,075	86
Dove Bros.	2,015	90
J. Harper	1,955*	195†

* Accepted. † Not accepted.

For repairing and painting the infirmary and Havil-street workhouse and offices, St. Giles, Camberwell:—

	Infirmary.			Workhouse and Offices.		
Garneys, Willesden	£1,160	0	0 !	£530	0	0
Hancock, Lower Norwood	794	0	0	522	0	0
Taylor & Parfitt, Haggerstone	755	0	0	469	0	0
Young, Cockerill, & Foster, Kennington-road	750	0	0	350	0	0
Seal Bros., Richmond	700	0	0	498	0	0
Richards, Dover-street	625	0	0	—		
Cooper, Southampton-street	623	0	0	844	0	0
Gipson, Philip-road	570	0	0	—		
Belcher & Ulmer, Queen Victoria-street	570	0	0	320	0	0
W. Baker	568	0	0	—		
Stewart, Chapter-road, Lorrimore-square	476	15	0	266	6	6
Monerieff, Benhill-road	450	0	0	290	0	0
Vandivorin, New-cross	435	0	0	—		
Blow, Mint-street, Tower-hill	434	0	0	557	0	0
Cooking Bros., Peckham-rye	450	0	0	—		
R. Williams, Inglefield-road	415	0	0	275	0	0
Goad, Camberwell-road	403	0	0*	*307	0	0
McCarthy, Bishopsgate-st.	400	0	0	480	0	0
Fullager, Kingsland-road	397	0	0	—		
Surridge, Lower Park-road	396	0	0	268	0	0
Bone & Co., Park-st., N.W.	329	10	0 !	—		
Burling, Leipsic-road	—			691	0	0
Mason Bros.	—			334	0	0

* Accepted.

For eight warehouses in St. George's-street, E., for Messrs. Gooch & Cousens. Mr. Robert J. Worley, architect. Quantities by Mr. E. C. Gleed:—

Higgs & Hill	£30,930 0 0
R. Conder	28,440 0 0
J. R. Hunt	28,374 0 0
Lawrence	27,931 0 0

For a photo-lithographic room, Nottingham, for Mr. A. Goster. Messrs. S. Dutton Walker & Howitt, architects:—

Messenger, Loughborough	£590 8 6
Cowen, Nottingham	560 0 0
Middleton, Nottingham	530 0 0
Goddard & Massey, Nottingham*	503 0 0

* Accepted.

For building four small houses and altering two others, at Uxbridge. Mr. George Eves, architect:—

H. Borton	£1,449 4 0
Kearley	1,257 0 0
Pratt	1,227 7 6
Hardy	1,139 0 0
Taylor	1,044 0 0

For six cottages, Boundary-road, Walthamstow, for Mr. W. Brown. Mr. John Edward Sears, architect:—

Stringfellow	£2,010 0 0
Good Bros.	1,975 0 0
Probert	1,825 0 0
Abbott	1,750 0 0
Adams (accepted)	1,630 0 0

For detached house at Esher, for Mr. J. J. Bates. Mr. Richard Tomlinson, architect. Quantities by the architect:—

Warr	£833 0 0
Parker (accepted)	830 0 0

For new grammar-school buildings, High Wycombe. Mr. Arthur Vernon, architect:—

H. J. Hunter, Willenhall	£5,667 0 0
C. Claridge, Banbury	5,095 0 0
Taylor & Grist, Bierton, Aylesbury	5,201 10 0
J. Crook, Southampton	5,147 0 0
Y. J. Lovell, Great Marlow	4,910 0 0
W. Woodbridge, Maidenhead	4,878 0 0
G. White, Shepherd's-bush	4,800 0 0
Esau George, Stantonbury, Stony Stratford	4,622 0 0
G. H. Gibson, Wycombe	4,580 0 0
C. H. Hunt, Wycombe	4,449 0 0
W. R. Loosley, Wycombe	4,350 0 0
N. J. Corby, Wycombe	4,197 10 0

For the erection of public buildings and offices for the Brownhills Local Board. Mr. J. Siddalls, architect. Quantities by the architect:—

E. Goodall, Brownhills	£2,245 0 0
J. Jones & Sons, Sedgeley	1,890 0 0
A. Lynex, Walsall	1,838 0 0
Bradney & Co., Wolverhampton	1,785 0 0
H. E. Cresswell, Walsall-wood	1,697 0 0
J. Garlick, Saltley Works, Birmingham (accepted)	1,631 0 0

For alterations and additions at Victoria Tavern, Choumert-road, Peckham, for Mr. W. Les. Mr. Henry Roberts, architect:—

Builder's Work.

F. P. Treweeke	£730 0 0
J. Whisker	726 0 0
H. L. Holloway, New-cross (accepted)	637 0 0

Cabinet Work and Fittings.

S. Hill	397 0 0
H. L. Holloway	395 0 0
J. W. Taylor (accepted)	361 0 0

For villa residence, at Windsor, for Mr. Lannon. Messrs. Byrne & Crombie, architects. No quantities:—

A. Squelch, Egham	£700 0 0
Woodbridge, Maidenhead (accepted)	593 0 0
A. L. Oades & Sons	585 0 0

For additions to Gothic Villa, Ascot, for Dr. Fagge. Messrs. Byrne & Crombie, architects. No quantities:—

Morris, London	£1,300 0 0 !
D. Laing, London	1,082 0 0
Pither, Sunninghill	650 0 0
Abbott & Charman, Ascot (accepted)	626 0 0 !

For pair of villa residences, Englefield-green, Windsor, for Mr. Sadler. Messrs. Byrne & Crombie, architects. Quantities supplied:—

Simpson, Egham	£700 0 0
Neysmith, Chertsey	685 0 0
A. L. Oades & Sons, Egham (accepted)	690 0 0

For farm buildings and cottages on the Narborough Hall estate, Norfolk, for Mr. J. Crutobley-Martin. Messrs. Wm. Adams & Son, architects:—

Bardell Bros., Lynn	£1,475 0 0
Foster & Chambers, Dersingham	1,468 7 0
J. Fryer, Wereham	1,458 19 0
W. H. Brown, Lynn	1,368 0 0
Girling, Wisbech (accepted)	1,364 8 0

For receiving and vagrant wards at King's Lynn Union Workhouse. Messrs. Wm. Adams & Son, architects:—

Bardell Bros., Lynn	£1,240 0 0
W. H. Brown, Lynn	1,230 0 0
Dye & Clack, Lynn	1,210 0 0
H. Collison, Lynn	1,165 0 0
R. W. Fayers, Lynn	1,117 0 0
J. Leach, Lynn	1,100 0 0
Dawes Bros., Lynn (accepted)	1,085 16 0

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The "Jubilee" of the British Association.

IT is difficult to estimate rightly the characteristics of our own time, or of a time close to our own, and there is among most men a tendency to unduly depreciate the present, to look back to greater things which were done in former times, and to regard the achievements of their own day as comparatively slight and wanting in the elements of grandeur which characterised the men and the achievements of some great epoch of the past. Those who are interested in artistic and architectural subjects especially are very familiar with this idea. Great and original architecture seems a thing of the past; painting is a much more feeble power in modern life than it was in the Cinquecento period; sculpture is far below what it was with the Greeks; no second Shakspeare has renewed the glory of the Elizabethan drama. The view taken by the *laudator temporis acti* cannot but be admitted to be, in the main, reasonable and true, if sometimes pushed too far, in regard to this class of the subjects of human study and interest. But those who therefore think that we have fallen on a weak and uninteresting period of human history forget that an age weak in one direction may be strong in another direction, and that it is often exactly when one class of faculties is comparatively weak and imitative, that another is strong and active in origination.

The reflection could not receive more marked illustration than by the comparison which the fiftieth anniversary of the British Association naturally suggests between the position of science now and when they held their first meeting in the same city. The result is really almost startling. It needs but to give this glance backwards in thought, to the state of the scientific world fifty years ago, to realise that we are living in one of the most remarkable epochs in the history of mankind. The mere material progress represented by the railway and electric telegraph system would be a great deal; they are certainly the most marked and important steps in what may be called the social mechanism of life that we know of in history, and their moral effects have indirectly been very great also. But these inventions and their results sink almost into insignificance when we look at the step which has been made in regard to our general theory of the history of our planet and the history of life on it, of our relation to our physical antecedents and our physical surroundings, of the very idea of what life means, which the deductions of science have led to during these fifty years. The step is really a tremendous one, and even to say that the epoch is as remarkable as that in which Galileo and Newton discovered some of the main truths about the solar system is far short of the truth. The discovery of the powers of spectrum analysis, and the consequent capability to grasp at the physical constituents even of the fixed stars, may be sufficient to set against that of the laws of gravitation by Newton; but some of the leading subjects of investigation of modern science are of a much more delicate and complicated nature than any investigations which are concerned with bodies moving by mathematical laws. The study of the infinite varieties of life on this planet, of the infinite varieties of disease too, and the manner in which they are produced and may be checked or nullified, is a study more complicated and requiring closer and more multifarious experiment and investigation than the apparently grander and more sublime, as well as more ancient, science of astronomy. But the influence of the study of life, past and present, on this earth, on what may in one sense be called our moral conception of life and its problems and duties, has been a tremendous one, where its significance has been grasped at all; and there has been no other epoch in which the influence of science upon man, not merely in regard to facts, but to the inferences from those facts, has been so immense and so important as it has been during great part of the last fifty years, and more especially during the last fifteen or twenty. To those who think at all about the meaning of what they hear, the facts of the palæontologist and of the physiologist, wonderful and interesting as they are, are merely the skeleton on which will grow, is growing even now, a whole living body of new social and moral beliefs.

It is out of our province to pursue this view of the subject; utterly impossible, at the same time, to refer to recent scientific progress without a side glance at its inevitable logical results. Avoiding that ground, however, and keeping to the purely scientific view of the subject, we cannot but be struck, quite apart from the practical interest of many scientific discoveries considered in detail, with the general effect of increased scale of everything, increased range of mental vision, which has been opened to us during the last fifty years. Through the "perspective glass" now presented to us by science we look back and around us, and are astonished at the way we have come and the distances that open out on all sides, and the unexpected relations we discern between phenomena once supposed to be isolated and disconnected. Time has stretched out behind us to immeasurable and almost unthinkable periods; epochs once regarded as distant are now but as yesterday; events which happen to-day, forms of life that are familiar to us, are shown to have their real originating causes in a past more remote than our fathers of the last generation ever imagined as existing at all; facts apparently, to the unscientific eye, unconnected with each other, are shown to be only links in a continuous chain of cause and effect. In some cases science seems to act by a kind of contrary motion; she pushes the object of our investigation farther from us than ever with one hand, while with the other hand she gives us the instrument that will enable us to bring it nearer than ever. With the parallax measurement she thrusts the fixed star into gulfs of space which can only be measured by the time occupied by the passage of their light to us: with the spectrum analysis she shows us nevertheless how that light can bring, after its enormous journey, information as to the chemical constituents of the body from which it emanates. This was one of the points touched upon in Sir John Lubbock's address as an example of the danger of limiting the powers of scientific investigation, since no less a man than Comte, as we had ourselves pointed out a fortnight ago, had assumed as a matter of course that of the chemical composition of the heavenly bodies "we could never know anything." Taken altogether, the retrospect of the last fifty years suggested by the President at this meeting of the British Association offers a wonderful and entrancing spectacle of what it is within the powers of man to understand and discover, and suggests ideas as to what the future may accomplish to which it is difficult to assign any limit; and those who imagine we live in a worn-out and uninteresting period may rest assured that they are either looking the wrong way or looking with their eyes shut.

We must descend, however, from the general to the particular in order to notice some of the special points which have been touched upon during the meeting that has just been held at York. We have already referred to Sir John Lubbock's address, which was a clear and concise survey of the scientific progress of the last fifty years, bringing out more in detail some of the remarkable steps in scientific knowledge to which we have referred in a necessarily cursory manner. The subjects touched on successively as those in which great steps have been made were partly of purely intellectual, partly of practical value. The "origin of species," the greatest step in natural science since the time of Newton certainly, was first referred to, and one or two of the popular fallacies in regard to it corrected. Then was passed in review the remarkable light thrown on the question of disease and its cure by the germ-theory of the development of disease, which grew, curiously enough, out of researches in reference to what most scientific men believe to be an entirely groundless theory,—that of spontaneous generation. The experiments made in this direction have had the result of destroying for the present all

the supposed grounds of belief in spontaneous generation, and at the same time, also, have had the very important result of bringing to light a great deal of unspontaneous generation where it was little suspected before, and of leading us to regard many diseases certainly, and all probably, as the result of vegetable or animal growths of a very minute nature, which may be destroyed by finding out and inducing conditions in which their deleterious life cannot be supported. Already some physicians, too sanguine perhaps, are talking of a not far-distant period when disease, no longer regarded as a kind of mysterious visitation of Providence, but as a parasitic growth possible only under certain ascertainable conditions, shall be "stamped out." Then from our own individual being we were invited to consider the structure and what may be called the diseases of the "*Grand Etre*," as Comte fancifully called the earth: a subject which was treated of more in detail afterwards in one or two sectional papers. From the earth it was a natural transition to the other bodies, among whom it plays a very insignificant, though to us all-important, part; and from astronomy again to the question of the meaning and composition of the light by which alone we are conscious of their existence. Here the President touched upon a subject which has much interest for many of our readers, the composition and relation of colours; and it may interest some of our correspondents who wrote to us not long since on the subject of colour, to know that as long ago as 1792 the common idea that red, blue, and yellow are "primary colours" was contradicted by Wünsch, whose theory is now generally accepted by scientists in colour, though long neglected; and Sir John Lubbock did not fail to emphasise the distinction, so entirely ignored by many, between colours and pigments, and to show that because blue and yellow pigments made a green pigment, it by no means follows that blue and yellow rays of light produce a green colour, which, in fact, they do not; and this part of the presidential address may afford to people who are sad by reason of the disrespect thrown upon their ancient and respectable theory of primary colours, some hint as to the direction in which to seek for scientific truth in a matter so interesting, theoretically, if not practically, to those whose business or profession it is to "lay the colours on," as we once heard an eminent painter describe his trade. Running over rapidly the principal practical scientific inventions of the half-century,—a remarkable list in themselves, and which could only just be touched upon,—the President summed up in claiming lastly for science that it had evolved and brought into being the very idea of "progress," which he affirmed was unknown to the ancients, and was only due in modern times to the mode of thinking induced by science. To this we must demur, as one of those too comprehensive generalisations sometimes made by scientific men, who look at all things in heaven and earth from a too exclusively scientific point of view. There is no doubt that the idea of the Darwinian theory has given a great impetus to the conception of a possible continual upward progress of the human race from higher to higher knowledge, and that this idea is more prominent in the minds of men just now than it ever has been before, owing to the enormous vistas of possible discovery with which modern science has dazzled them. But we certainly are not in a position to say that the idea of progress was unknown to the ancients, or that a people who, like the Greeks, rose steadily through imperfect forms of art to the most perfect that has ever been seen, had not the conception of progress. But then progress in art, we fear, your true scientist thinks very little of; and that is just one part of the narrowness of the scientific mind,—not a petty narrowness, but a narrowness (if we may so say) on a great scale, against which those who are dazzled by the great power and aspirations of modern science need to be on their guard, remembering that, after all, scientific knowledge and acquirements appeal only to one-half of the human mind, and cannot in themselves satisfy a complete and imaginative nature. But that is just the mistake the prophets of science make, and for which another generation will probably to some extent take its revenge on them.

In glancing through some of the sectional subjects, and the suggestions involved in them, we take note here only of those which bear more or less on the practical subjects which are of special interest to ourselves. Artistic subjects, equally interesting certainly to us, do not, of course, come into the programme of the British Association. First among these subjects we come on Sir W. Thomson's address, as President of the Mathematical and Physical Science Section. This was a brilliant, — may we add, somewhat sensational?—*resumé* of the position in regard to available powers for driving mechanism. Coal, we were again told, was getting rapidly exhausted, though we cannot help thinking it has a longer lease before it than some authorities are willing to allow; rain-storage is entirely delusive as a means of accumulating power in any economical form; electric power is the power of the future,—all we want to work it is a cheap motive power, if possible utilising some natural and permanent force in nature. Cheap windmills, Sir W. Thomson thinks, we shall want, though he admits that wind is a somewhat uncertain agency,—more so, he seems to think, than formerly; and special means to supply the batteries would have to be provided for use in the event of calms. But another suggestion is to utilise Niagara for a large area,—say 300 miles round the site of the falls,—for supplying the power to drive powerful and numerous batteries for lighting the world by electricity. There, certainly, is an enormous power lying unused except as a spectacle. But what a chorus of complaint and objurgation would rise up at any serious proposition to turn Niagara into a huge mill-shoot. We doubt if public opinion would allow it to be done, and we can hardly say that we should not be on the side of public opinion; however, we do not anticipate being called upon to assist public opinion on the subject either one way or the other for a considerable time to come. The President of the Mechanical Section, Sir W. Armstrong, dwelt chiefly on the same subject, the utilisation of electricity, not merely in lighting, but as a mechanical power. The idea suggested chiefly in Sir W. Armstrong's address * was that of the possibility of converting the sun's heat into electric energy, which would give us an almost unlimited stock of power whenever the apparatus is forthcoming to produce the conversion. Until then, we must be content to use electricity for the most part not as a prime force, but as a result of force, or a means of conveying it; and in this connexion we observe he also speaks of the time when we shall have commenced the utilisation of waterfalls for this purpose as a time certainly coming and in fact not far off. We will not say that the result may not work for the greatest happiness of the greatest number, in which case its accomplishment, if materially practicable, is certain to follow sooner or later, but we cannot repress a feeling of sympathy with the many people who would feel keenly the transmutation of all the waterfalls into "powers." Their use in this way, however, and still more the conversion of the sun's heat into electric force, if it were ever accomplished, would at last be the realisation, practically, of the old baseless dream of "perpetual motion," though in a different sense from that in which it was sought for by the dreamers themselves. Persons who are sensitive on the subject of the English climate may be amused at the idea of evolving anything like "perpetual" motive power from the heat of the sun in this country; but it must be remembered that we should now be able to calculate, or at least it seems probable that we should, on the transmission of power to great distances, not only by the electric current, but by the farther development which may be expected from Faure's accumulator as a facility for the storage of "force."

The utilisation of the electric light, which meets us at every turn and in every form at present, was further illustrated in what appears to be an already practically realised success, in the interesting account given by Dr. Siemens in his paper communicated to the Physical Science Section. This was a description of his experimental introduction of electric light in his own greenhouses, with the view of ascertaining whether the lighting up of the plants with this light between sunset and sunrise, imitating as far as possible the effect of continuous sunshine, would promote more rapid and fuller growth. The results, according to his account, are exceedingly remarkable and unexpected. It would be the natural conclusion, we imagine, of most people, that the interruption of the regular recurrence of darkness would be such a violen change from the general conditions of vegetable growth as to be injurious rather than beneficial. And it appears that in the first instance the effect of the naked light on the plants was decidedly injurious, and the plants soon showed a withered appearance. One attempt to reduce the direct effect of the light was by introducing into the house jets of steam drawing atmospheric air with them, and thus imitating the effect of interposed and passing clouds. This effected an improvement, but subsequent experiments showed that a still better result was obtained by merely interposing a sheet of clear glass between the light and the plants, and that under these circumstances the plants throve remarkably, and, in fact, abnormally. So marked was the effect of the glass that when a small sheet was interposed so as only half to screen a plant from the light, the line of demarcation between the part illuminated by the naked light and that screened by the glass was distinctly visible on the leaves of the plant. This seems to show that the deleterious effect of the light was chemical; but to us the interest of the experiment lies in the conclusion which it seems to point to that, recognising the strong analogy between life and growth in plants and in animal organisms (indeed, modern science hardly draws a line between them in some respects), the far greater use of strong artificial light such as the electric light need not in the end be expected to produce any ill results on human life; and, in fact, that the idea of the necessity of periods of darkness is a habit which may be broken through with a little effort without injury to organic life. As we do not yet know to what lengths the use of electric light may eventually be carried in turning night into day, it is certainly very significant to find that plant life, at any rate, seems rather to gain than to lose by this change of its conditions, extreme as it seems. It would be strange if science were in the end to lead to the practical conclusion that such an important procedure in nature as the alternation of light and darkness on our planet was after all no essential condition of healthy life, but a kind of prodigious accident, the loss of which would leave us in reality little altered! The necessity in animal life for regularly recurring periods of rest would of course remain. In the mean time the practical results in regard to vegetables seem to be actually appreciable in more rapid and luxuriant growth and therefore more economical use of the greenhouse. Where may, or, rather, where may not, this end? Already Dr. Siemens hints at the possibility of the gardener actually having, practically, the alteration and variation of the seasons at his command. The possible (may we not say, highly probable?) part to be played by electricity in the locomotion of the future was strongly emphasised also not only in Sir W. Armstrong's address before referred to, but in one by Sir F. J. Bramwell on the developments of mechanical engineering during the last fifty years. He concluded by referring to the steam engine as already almost a thing of the past, and doubted whether those who would meet fifty years hence would find them except in museums. There is unquestionably, however, a good deal to be done before a locomotive agent so swift, powerful, and tractable as the locomotive engine of to-day, will be realised in any other form.

We may conclude by reference to a paper which, though dealing with a much smaller subject than those we have been referring to, touches especially on our province. This was Professor Owen's address as President of the Zoology and Botany Department, which consisted of a full and very racy account of the initiation and subsequent history of the National Natural History Museum. The story told by Professor Owen is instructive in regard to what may be gained by resolutely sticking to one's point even against apparently hopeless odds. Professor Owen's large scheme, demanding a site ten acres in extent, was condemned not only by a Parliamentary Committee (which would not go for much), but by a number of the most eminent scientific men of the day, the Professor standing quite alone in his recommendation of the scheme. The objections to it were partly economical, partly due to a theory, perhaps to some extent founded on the other objection, that so large a collection was only bewildering and cumbersome, and of no real use for purposes of instruction. Professor Owen has now, however, got, if not his ten acres, at least eight of them, and he may rightly feel gratification in remembering, as he

* The pith of this paper, and of others most likely to interest our readers, we print on other pages.

says, that his sole responsibility for the scheme is recorded, though in expressions more terse than complimentary, in the pages of that voluminous publication which, he suggests, may outlast the organisation of the body whose debates it records. In the course of his address Professor Owen spoke with admiration of the thorough manner in which Mr. Gladstone went into the question when it came before him while in office, going personally into every corner of the department in the British Museum, cellars included, and seeing everything for himself; and he also expressed very warmly his praise of the new building and of the ability shown by Mr. Waterhouse in its arrangement and architectural treatment, in which few of our readers will disagree with him.

Electricity, however has been the central subject of this meeting of the Association, which has been a very brilliant and interesting one, and which suggests far more topics for reflection and expectation in regard to the future than we have been able to touch upon here. To some of these we may return.

1881: A GREAT CENTENARY FOR ENGLAND.

THE celebration of centenaries is a habit which, in many cases, would to our mind be better honoured in the breach than in the observance,—the link between the lapse of a century and the event commemorated as being a century old being usually one of a purely arithmetical order. The year 1881, however, observed or not, is a centenary of the first importance to England. The present year marks the close of the first hundred years of the actual existence of that invention which has done more, not only than any other, but than all others, to revolutionise the relation borne by man to the planet which he inhabits. "In 1781," said Sir John Rennie, in his address to the annual general meeting of the Institution of Civil Engineers on the 20th of January, 1846, "Watt invented the means of producing rotary motion by the steam-engine, first by the crank, and afterwards by the sun and planet wheel, thus rendering it applicable for the purpose of driving all kinds of machinery, which was a grand step towards the improvement of manufactures." In fact, this simple and beautiful invention has been to the steam-engine, generically, what the blast has been to the locomotive, specifically. It has supplied the one practical link between the source and the application of motion, without which mechanism would have been imperfect and clumsy. For the honour of inventing the steam-engine there are many claimants. In 1698, it was first rendered, by Savery, an efficient means of raising water. In 1712 it was actively employed for that purpose, by means of a steam cylinder, into which cold water was injected for forming a vacuum, so as to enable a movable piston to be impelled by the pressure of the atmosphere, to which, by the use of a lever, a pump for raising water was attached. In 1713-8 this pump was so improved as to be made self-acting; but the consumption and expense of fuel were so great that its application was very limited. But while Watt, from 1777 to 1782, was perfecting his idea of the application of steam, with expansion and with double action, above and below the piston; while, in 1784, he invented the parallel motion, working gear and valves, the governor, and other important details, which were brought together in the machinery for the first steam mills, the Albion Mills, in 1784,—the inland navigation of England was being adapted for the distribution of fuel, at low prices, in every district that was served by a canal. In 1758 Brindley was withdrawn, by the Duke of Bridgewater, from his occupation as a millwright, for the purpose of executing the Bridgewater Canal. In conjunction with Smeaton and others, he subsequently executed, with great success, the Trent and Mersey, the Leeds and Liverpool, the Birmingham, and the Forth and Clyde canals: works that remain as lasting monuments of his skill and genius in this branch of the duties of the civil engineer. Our canals had only been dug to an aggregate length of about 4,000 miles (4,138 we make to be the nearest approximation to exactitude that is obtainable), when the railway companies began to struggle for a traffic which they had far better have left to the canals. At the present time, 1,716 miles of canal have been purchased, leased, or otherwise acquired by the railway companies, which have now obtained the command of the inland coal traffic; although the open highway of the sea has happily prevented the existence of the monopoly sought for by the struggle.

The opening of our coalfields was the immediate result of the creation of our canals. The ready and cheap transport of coal gives to the steam engine that food on which its economic value depends. The average consumption of coal, per indicated horse-power per hour, in steam ships with compound engines in long sea voyages, averages 2·11 lb. (Manual of Rules, Tables, and Data for Mechanical Engineers, p. 889). The performance of some of the most powerful railway locomotives has been measured as 2·28 lb. of coal per horse-power per hour, ascertained by load and speed. The gross work done on a piston by 1 lb. of steam varies, in round numbers, from 56,000 to 62,000 foot pounds, equivalent to from 72 to 80 units of heat. This work rises, by the use of expansion, to as much as 150,000 foot pounds, when expanded about six times, and cutting off about 10 per cent. of the stroke. Even under the most favourable circumstances, only 20 per cent., or one-fifth part, of the heat consumed is converted into work. The highest duty recorded in the Cornish mines, where great attention is paid to this subject, was 108,000,000 pounds lifted 1 ft. high by the consumption of a bushel of Welsh coals, weighing 94 lb., at the United Mines, in 1842 This is equal to nearly 1,149,000 foot pounds of work done by the consumption of 1 lb. of coal. Taking this as a result possible with the best fixed machinery under the most advantageous circumstances, and comparing it with the former result of about 2¼ lb. per horse-power per hour applied to locomotion or navigation, it is evident that one quarter of a cwt. or 28 lb. per horse-power per day of ten hours, is a very attainable result for a good steam-engine. At 300 working days per annum this is equal to 3·75 tons of coal per horse-power per year. To allow for waste and mismanagement, let us say five tons. The average price of this, at the pit's mouth, is from 5s. to 7s. per ton, or a mean of 30s. plus the cost of carriage of the fuel, for the cost of a horse-power for a year.

It was estimated by Mr. Cossham, a coal-owner of experience, in 1877, that 23·50 per cent. of the coal raised in Great Britain was used in raising steam for manufactures, and another 4 per cent. for steam and railway locomotion. Returns of the coal raised do not go back further than the year 1854, when the total output was 64,660,000 tons. From the proportion borne by the product of the South Wales coal-fields, of which the yield in 1800 is known, to the whole produce of the United Kingdom, we estimate the yield of 1800 at 16,666,000 tons. At that time, however, the allowance for steam-locomotion and navigation was not required. For manufacturing purposes alone, Mr. Cossham's rule would give a consumption of 3,915,000 tons of coal in 1800, and our rule would make this represent a force of 781,000 horses. In 1879 the out-put of our collieries is returned at 133,800,000 tons. The proportion assignable to steam-power is 36,795,000 tons. The equivalent power developed is that of 7,359,000 horses.

Such, then, is an approximate statement of what the genius of the engineer has done for England. If we name James Watt as the foreman of the goodly company in which Smeaton, Brindley, Telford, George and Robert Stephenson, Mark and Isambard Brunel, and so many others, have been fellow workers, it is not with the idea that merit can be thus personally distributed. If we speak of the birthday of the Crank, it is only as one of the simplest and most beautiful details, mechanically speaking, which have been combined to allow of the present wonderful organisation of the steam-engine. With that reserve, the centenary of the birthday of the crank is one of the most important that has ever occurred in the annals of England. It measures a century of progress such as the world never saw before. And it commemorates an invention which has placed at the service of England,—a service not negligently exacted or performed,—a force greater than that which could be exerted by seven millions of horses.

It would be of great national service to obtain a census of the steam engines of England. The only element for such a statement which exists is the return of railway locomotives. In 1879 there were 13,174 of these engines on the railways of the United Kingdom. A powerful passenger engine, on the Great Northern Railway, was stated, in a discussion at the Institution of Civil Engineers, on the 11th of November, 1873 (see vol. xxxvii. of the Proceedings), to do the work of 678 horse-power. It is not usual to state the work of the locomotive in horse-power, as so much depends on the speed at which it is driven. But if we take less than half the Great Northern power, say, for the sake of simplicity, 333 horse-power per locomotive, we find these machines to represent a power equal to that of 4,386,942 horses. That, of course, is a statement not of work done by them, but of the work which they are able to perform, if all at work at the same time, and to keep up, if supplied with fuel, burning rather less than 28 lb. of coal to the mile run.

As to the actual horse-power of our steam fleet, no returns exist. There is, moreover, a very great difference between the nominal horse-power and that at which the same engines are capable of being worked. Thus, the *Scythia*, one of the Cunard line of packets, with a builder's measurement of 4,566 tons, has compound direct-acting engines of 600 nominal horse-power, which are capable of being worked up to five times that amount, or 3,000-horse-power. In our war fleet, where great speed is required, the indicated horse-power is at times as much as or even more than 1-horse-power per ton. The *Plucky*, a little vessel of 198 tons displacement, has a steam power of 224-horse power. The *Pickle*, of 254 tons, has 268 i. horse-power. Among the larger vessels, the *Agincourt*, with a displacement of 9,071 tons, has a steam-power of 6,867-horse-power. The *Inconstant*, with 5,328 tons displacement, has 7,361-horse-power. The *Sultan*, with 8,714 tons displacement, has 8,629-horse-power. The *Hotspur*, a twin-screw vessel, with 3,980 tons displacement, has 3,497 i. horse-power. Mr. Clement Mackow, in his excellent "Naval Architect's and Shipbuilder's Pocket-book," gives a table of the co-efficients of performance of fifty of her Majesty's screw vessels. Of the eleven items which are tabulated, there is but one column in which anything like regularity is maintained. That is the column headed $\frac{V^3 \times D^{\frac{2}{3}}}{H}$ by which formula is signified the cube of the velocity, multiplied by two-thirds of the displacement, and divided by the indicated horse-power. But the values even in this column vary from 94·9 to 289·6. If we take the figures 175 as a mean for this column, we find that for a mean speed of ten knots per hour, 380 i. horse-power are required for every 1,000 tons of shipping. The total number of steam-vessels registered as belonging to the United Kingdom at the end of 1880 was 5,247 (or four times the number of the locomotives on the railways), with an aggregate tonnage of 2,723,468. The approximate rule which we have ventured to formulate, and which we think will be rather under than over the mark, makes the steam-power required for this tonnage amount to a force of 1,033,000 horse-power. But there can be but little doubt that if the method adopted by Mr. Robinson were applied, and if the actual resistance overcome by the steam fleet were calculated in horse-power, we should arrive at much larger figures. According to the Navy List, the Royal Navy contains 993,748 tons of shipping, N.M., and 679,473 H.P. The combustion of 3,000,000 tons of coal, which is probably a low estimate for the coaling of the mercantile navy, would represent a force of 600,000 horses,—but one in constant exercise for ten horses per day, and for 300 days in the year. The difference between the potential and the actually exerted steam-power of steam-vessels, as well as of locomotives, is enormous; and the same may be said with reference to the vast stationary steam-machinery of the country, the estimate for the coal consumed by which, in 1869, was nearly six times as much as that required for the purposes of navigation and railway locomotion.

The Coming Social Science Congress.—As already announced, this year's Congress of the National Association for the Promotion of Social Science will be held in Dublin from the 3rd to the 8th of October. The Right Hon. Lord O'Hagan, Lord Chancellor of Ireland, will be the President of the Congress. The President of the Health Department will be Dr. Cameron, M.P., while the Right Hon. Viscount Powerscourt will preside over the section devoted to the discussion of Art questions.

BUILDING AND DECORATION IN VIENNA.

In our last notice on building in Vienna,* we omitted mentioning the progress of the new Palace of Justice, an edifice the erection of which was commenced as early as 1875, and which is now rapidly approaching completion. We gave some particulars of the building, together with an interior view, in the *Builder* of September 14, 1878, and we are now able to furnish some additional details, more especially with respect to its decoration.

The estimate of the architect, A. von Wielemans, is three million florins (250,000*l.*). The building is to receive the supreme court of justice, the court of appeal, the court for civil cases, and the tribunal of commerce. The vestibule will have a height of 29 ft. 6 in., and its ceiling will be supported by twelve columns of Untersberg marble. This entrance leads into a central hall of rather gigantic dimensions, being 82 ft. high. The public courts are in the first story. The lobby of the supreme court is a hall 98 ft. 6 in. long, round which are offices. The plans for the new *Justizpalast* were exhibited in the summer of 1874, the designs being in all possible and impossible styles of architecture. The jury selected that of Wielemans, a young and until then little known architect (one of the most talented disciples of van der Nüll, Sickardsburg, and especially of F. von Schmidt, the cathedral architect), who was finally entrusted with the direction of building operation in September of the same year. The colossal edifice, the foundations of which, as we have already said, were begun in 1875, and which is one of the best architectural monuments of Vienna, is now nearly completed in all its details, and covers an area of 93,000 square feet. The architect selected the German Renaissance style, embellishing his work by a wealth of interesting details, the whole conception testifying to considerable genius. The portico is reached by fiers with convenient ascent, on the flanking pedestals of which sculptured lions will ultimately be placed. The principal façade of the two-storied building is marked by a powerful pediment and two turrets. Over the principal portal, in the pediment, a colossal figure of Austria, by Helmer, is placed, in effective contrast to the dark background of the niche in which it stands. The free space in front of the Palace of Justice is unfortunately of a trapezoid form, but it is intended to mask this eyesore by suitable garden grounds.

The interior of the building is full of well-conceived and tasteful architectural and decorative details. Amongst these may be mentioned the pedestals of the columns, richly sculptured by Pokorny, as well as all the lanterns, candelabra, door-railings, balustrades of wrought iron, the splendid oak doors, wooden panels, &c. It is soon perceived that everybody engaged in the work has tried to do his best. The art industries of Vienna have shown on this occasion what they are able to perform; but it should be mentioned that the architect has been ably assisted by coadjutors, such as the Cologne architect Dominik Asanzo, the engineer Arthur von Wielemans, and others. If the exterior of the edifice appears clearly and well defined on the whole as well as in detail, the interior is well lighted in all the rooms and convenient in its communications. We proceed now to describe the principal rooms.

The vestibule is carried through two stories, and is a splendid space, with a ceiling supported by columns. The shafts are of reddish Salzburg marble, the bases being in Grusignano marble richly carved. The centre of the ceiling is adorned by a slab, carried by two decorative supports, with the inscription "Justitia regnorum fundamentum" (the well-known motto of the Emperor Francis I.). Next to the vestibule is the great central hall, also a grand room, carried through all the stories of the building, which explains its great height of 82 ft. before mentioned. The soft shades of the painted-glass ceiling harmonise pleasantly with the various colours of the marble and granite. The arcades of this hall, which is, properly speaking, a court, are supported by handsome square pillars on the ground-floor, in the first story by columns of red Pavenno granite, the second story being a mezzanine. A principal object in this hall is presented by the stairs facing the entrance, with steps of Salzburg and balustrades of Trient marble, the latter with open-work ornamentation. In the spandrels of the first gallery the coats-of-arms of the Austrian crown-lands, carved and coloured, have been inserted. Above the stairs, in a niche flanked by double columns and surmounted by the imperial coat-of-arms, a symbolic female figure, 10 ft. high, and representing Justice, has been placed. It is in Laas marble, and is the work of Pendl, a Viennese sculptor.

These stairs lead to the principal courts in the first story, and to all the other rooms. The most remarkable one is the great court, carried through two stories. The funds for the frescoes, to be painted by Professor Eisenmenger and Julius Berger, have not yet been provided, and thus the "Functionssaal," as it is called, is devoid of all ornamentation, and will be used for a little while in its present white garb. The busts of the Austrian Emperor and Empress are the only decoration of the room. They were presented by the Vienna Chamber of Advocates. At the back of the principal stairs is the Advocates' Hall, which contains a handsomely-carved ceiling and wainscoting in the German Renaissance style. The fittings of the room, desks, tables, chairs, &c., though richly carved, are in keeping with the whole character of the edifice. The so-called "Plenissimum," or principal hall of the supreme court, is perhaps the most splendidly-decorated room of the building. It also has a carved wooden ceiling, in the centre of which an imperial eagle, 10 ft. in diameter, extends his wings. A frieze, painted by Jobst, and containing a series of portraits of Austrian emperors, runs round the room. Above the judge's seat, opposite the entrance, is the portrait of the present emperor, painted by Berga. The library, containing 10,000 volumes, is to the left of the supreme court. It has likewise a carved ceiling, a gallery of wrought iron, and neat desks and book-cases with brass screens. To the left of the library is the principal room of the court of appeal, adorned like the Plenissimum. The remaining public courts are arranged and fitted up on similar principles.

There remains yet to be mentioned the great lobby in the outer wing of the building, facing towards the Reichsrathplatz. Its ceiling is supported by double columns of grey Karst marble; its frieze bears the imperial family arms; over the entrances to the different courts have been placed such judicial emblems as sword, scales, fasces, &c.; marble tablets display the names of all chief judges, or judge-presidents, from the time of Maria Theresia to the present reign. On the occasion of laying the foundation-stone, which took place quite recently, after the building had been far advanced, the various speakers were full of praise respecting the new palace of justice, by the erection of which the Austrian capital has acquired another highly artistic and monumental edifice. Its builder, Alexander von Wielemans, has by his work at once established a reputation as one of the foremost architects of the Continent.

When we spoke of the progress of building and decoration in Vienna last, it was stated that the carriage approach to the new Houses of Parliament, as originally planned, would have to be abandoned. We now learn that the matter has been satisfactorily settled. Without trenching upon the area of the Ringstrasse, to be avoided at any cost, the approach will have a rise of about 1 in 20, and end in a semicircular terrace and stairs leading to the entrance. The approach will be brought out to the Ringstrasse, the level of the terrace lowered, and the entrance to the portico gained by stairs of seven steps. A large monumental fountain is to be placed in front of the approach and terrace.

Another matter of interest in Viennese art circles is the enlargement of the "House" of the Vienna Society of Artists, which was recently unanimously resolved upon at a general meeting of its members. It is believed that 250,000 florins will cover all building expenses. The society's house is to be extended towards the garden, of which a portion will be appropriated. Provisional plans have been prepared by the architects Streit and Schacher. It is proposed to erect a one-story building, joining the two back corner pavilions, and forming a parallelogram facing the Lothringer Strasse. A small court will be provided in the centre of the new wing. The Künstlerhaus will gain by this addition two rooms, lighted from above, each 85 ft. 6 in. long, 21 ft. 6 in. wide, and 20 ft. high, with a wall-space of about 4,300 square feet, and two galleries containing a wall-space of about 1,800 square feet each. The court will have two loggia for the reception of sculpture. When the project of the extension became first known, it seemed as if the owners of surrounding property would prove troublesome. But it was soon found that, even if the enlargement had included an additional story,—the old building is only two stories high,—the proposed addition would not have interfered with their outlook. Besides, any addition made could not well exceed the original height without spoiling the leading idea of the designer of the Artists' House, the late architect Weber. The enlargement has become absolutely necessary. When the House was first erected, it was thought that ample room had been provided for all emergencies; but since international art exhibitions have become the fashion, this supposition has proved to be fallacious and the space at disposal quite inadequate for such extended exhibitions.

Some life has recently been imparted to the building operations at the new University, which at one time seemed almost to have come to a standstill. They are proceeding now more actively; and although the building is still far from having assumed its final form, one is able even at this point to say that it will be a splendid edifice. Carved work and sculpture is making its appearance here and there; but the principal part of the adornment is awaiting execution. The courtyard of the University, with its arcades in the high Renaissance style, will be one of the largest and handsomest courts of the new buildings of Vienna. The walls of the arcades, simply ornamented, are in Groisbach stone. In the courtyard itself a monumental fountain will be placed. The arcades will receive frescoes, surrounded by rich stucco frames, and representing the development of the sciences. Several other spaces,—for instance, the vestibule, staircase, &c.,—will receive stucco work. The execution of the latter, and of all details, will be proceeded with slowly and piecemeal, so as to test their effect before completing the whole. The plastic decoration generally will be in various materials, stone, terra-cottas, and majolica. The statuary will be in the first-named material; the figures in the spandrels are to be in terra-cotta, the medallion portraits of majolica, white and blue with gold framing. Above the great pediment of the principal façade the figure of Nike or Victoria will be placed; in the pediment itself the birth of Athene (Minerva) is to be represented. The latter subject will be treated by Professor Tantenhayn. In the attics of the pavilions are to be placed figures representative of Medical Science, Jurisprudence, Philosophy, Theology; next to them will be ranged subjects representative of special branches of science, such as biology, civilisation, Bible study, &c. The side façades will be adorned by statues of mythological personages, amongst them Hermes (Mercury), Thalia, Apollo, Clio, Gæa, Neptune, Prometheus, Urania, Orpheus, &c. In the niches of pavilions of the first story the following figures will be placed:—Plato, Artistotle, St. Peter, Moses, Solon, Justinian, Hippocrates, Galenus, Charles the Great. The medallion-portraits will be those of Pliny, Erasmus, Descartes (Cartesius), Leibnitz, Newton, Galileo, Copernicus, Kepler. The tablets will contain the names of Kant, Lessing, Winckelmann, and other well-known names. Amongst the artists who will execute those works may be mentioned Rud. Weyer, Wagner, Jos. Gasser, Edm. Helmer, J. Berger, David, Silbervogel, &c. It is said in praise of the building that it will, when completed, display a harmony of architecture and the decorative arts seldom to be met with.

As if Vienna had not theatres enough already, another is to be added to the large number of playhouses possessed by the Austrian capital. Only three of them (of which two receive subventions) pay at all; the others eke out a precarious existence. But the latest addition, plans of which have already been prepared, and which is to be placed in the growing suburb of the "Landstrasse," is to be something quite out of the common. In its interior it is to resemble the well-known "Théâtre Eden," Brussels, and will combine within it winter gardens, refreshment rooms, lobbies, galleries, atria, loggias, &c. A peculiarity of the new theatre will be that from all these various places the performance may be witnessed. The promoters are an Antwerp Company, and the theatre is to be named the "Théâtre de Vienne." The plans have been prepared by the architects Wilhelm Kuhnen (the builder of the Théâtre Eden, Brussels) and Wilhelm Stiassny (Vienna). The building will

* See *Builder*, vol. xl. (May 21, 1881), p. 626.

have a length of 279 ft. and a width of 197 ft., and will be especially constructed and fitted up for the performance of sensational and historical pieces, transformation scenes, ballets, &c.

THE RIGHTS OF VENDORS AND PURCHASERS OF BUILDINGS IN REGARD TO EXISTING FIRE POLICIES.

IT is a curious fact that points of a comparatively elementary and everyday kind in regard to the law, which, it might naturally be supposed, would have long ago been settled, are continually cropping up. It is so in regard to this question of the rights of vendors and purchasers of buildings with reference to existing policies of fire insurance. To those who are concerned with buildings professionally or as investments few questions can be more important, and we confess that it is a matter for regret that in regard to one special and interesting point it is impossible to consider the subject as being in a thoroughly settled state. It may be well, first of all, to point out that, as a general rule, a purchaser does not get with the property any policy of insurance which exists upon that property; about this there can be no doubt, as the policy is a contract between two persons, the rights under which cannot be conveyed to another without an express agreement to this effect.

But the immediate question is not quite so broad as this, but it arises in this way: An agreement for the sale of a house is duly entered into, but, as usually is the case, a certain time is to elapse before the actual conveyance is executed and the purchase-money is paid to the vendor. If at the time at which the completion of the matter should take place, the purchaser is ready with the money, but the vendor will not complete his conveyance, the Chancery Division will, as many of our readers are aware, enforce the fulfilment of the agreement. But let us suppose that between the date of the agreement and the time for the completion of the bargain the house is burnt, and that there is an existing policy of insurance on it, and that the vendor receives the amount due from the insurance company. These are the facts which actually occurred in the recent case of Rayner *v.* Preston (50 *Law Journal*, Chancery Division, p. 472), a case which gave rise to much discussion both before the Master of the Rolls and the Court of Appeal.

Under such a state of things as this, the question,—one which it will be immediately perceived is of great practical importance,—arises, Does the vendor hold this money recovered from the insurance company for his own benefit, or is he bound to hand it over to the purchaser? In other words, does he receive it as a trustee for the purchaser? Having regard to this last case, it must be answered that the vendor may keep the money himself, and leave the purchaser the pleasure of repairing the damaged premises out of his own pocket. This was the conclusion arrived at not only by the Master of the Rolls, but by Lords Justices Brett and Cotton, as against the late Lord Justice James, who was of a contrary opinion. But, having regard to the great judicial value of the late Lord Justice James's opinion, it cannot be said that the law is in a thoroughly settled state, although a lawyer could give a confident opinion that until this case is reversed by a higher tribunal it is binding on any inferior court. And while upon this point, it may be well to point out that an unpaid vendor may recover from the insurance company; but whether, if the money were not expended on the building, he could keep it as against the company, is a matter of doubt, for after the judgment in the case of Rayner *v.* Preston had been delivered, Lord Justice Brett remarked, "I should like to add to what I have said, that I feel very considerable doubt indeed whether, as between the defendants (the vendors) and the insurance company, the defendants (the vendors) can keep the money." And in this doubt Lord Justice Cotton concurred.

Upon the main question, however, with which we are now chiefly concerned, few can doubt that in natural justice the purchaser should have the benefit of the money which the vendor recovers, and there is great force in the remark of Lord Justice James that "the policy of fire insurance is not a wagering contract,—a contract that if a fire happens then a certain sum shall be paid to the insurer; it is in terms and in effect a contract that if the property is injured the insurance company will make good the actual damage sustained by the property. That damage, and that damage only, gives the right, and is the measure of the right, to recover from the company." And the late Lord Justice, at the conclusion of his judgment, thus succinctly summarises his general opinion on the question,—"The relation between the vendor and purchaser was in law as from the date of the contract the relation of trustee and *cestui que trust*, and the trustee received the money by reason of and as the actual amount of the damage done to the trust property." But though our sympathies may go with the dissentient Lord Justice, it is difficult to overcome the reasoning of the other judges, who point out that the contract between the vendor and the insurance company was a purely personal one for the payment of money on the happening of certain conditions. Further, Lord Justice Cotton states, "the argument that the money is received by virtue or in respect of property which is trust property is, in my opinion, fallacious. The money is received by virtue or in respect of the contract of insurance, and though the fact that the insured had parted with all interest in the property insured would be an answer to the claim, on the principle that the contract is one of indemnity only, this is very different from the proposition that the money is received by reason of his legal interest in the property." It would be presumptuous for us when such able and distinguished lawyers are divided upon this question, confidently to give our opinion. But we confess that we are inclined to side with the majority on this occasion; nor do we know that the purchaser is so very much entitled to our sympathies for not getting the benefit of the policy existing on the buildings. For let us point out these facts. If there had been no contract of sale in existence, and the owner of the house, having received from the insurance company the amount of the damage done to the building by fire, had chosen not to reinstate it at all, or in a way which cost half the amount he received from the company, he would have been entitled to pocket the whole of the difference. The insurance company would not compel him to build up his house again if he preferred to have the money. Let us also suppose that there had been no insurance existing in the present case, and that the house was damaged to the extent of 500*l.*; the purchaser would have had to take it damaged to this extent, and worth less by so much than when the contract was made, without getting any corresponding diminution of the purchase-money. That being so, why should the mere chance of a policy existing place him in any better position as regards the vendor of the house, and why should the latter not exercise the option which he before possessed of keeping the money in his pocket or of repairing the house? It is true that no right-minded man would hesitate to hand over the sum received from the company to the buyer; but, looked at without regard to feelings, what right has the buyer to expect the seller to make him a present of this windfall, for such it would be to the vendor? If the purchaser wishes to be safe, he should make an express stipulation with the vendor that he shall have the benefit of any existing policy upon the buildings which are the subject of the contract. And the moral for practical men of business which is to be drawn from this decision is, that in all cases the purchaser should stipulate for the benefit of any existing policy, and, if the building is not insured, should insist that the vendor shall take out a policy of which the purchaser shall have the benefit, and then the latter will be in a perfectly safe position.

SAVE THE CORN!

COLONEL COXON in the *Times*, and another writer in the *Morning Post*, are reproducing a suggestion which we made some years ago in the *Builder* as to the desirability, in very wet seasons, of saving at least the ears of corn, leaving the stalks for treatment when weather would permit. Our own proposal was rather fiercely combated by a correspondent who spoke as a practical farmer. On all such questions there is a certain weight that attaches to the opinion of the man of practice as compared with the man of study. On the other hand, all improvements of all kinds have been improvements *on* practice, and have met with more or less opposition, not because they were not improvements, but because they were new. We therefore content ourselves on the present occasion with bringing the subject under the attention of those chiefly interested. But where, we may ask, is the apparatus for artificial drying of the corn, of which we heard so much a year or two ago? Speaking from memory, the inventor wrote to us to say that he had spent all that he could spend in promoting a great national object; that his success was assured, so far as proving the possibility of effecting that object was concerned, but that his heart was nearly broken by the want of interest which the public displayed. If ever there was an occasion on which mechanical harvesting needed to be supplemented by mechanical drying or ripening, it has been in the present season. Not till the very time of harvest did the rain fall. That, when the golden crops had so far matured, their promise should be frustrated by rain, is, in our opinion, a reproach and a scandal to our boasted civilisation. There are times when no human effort could make up for the inclemency of nature. But to lose the harvest, or any considerable proportion of the harvest, of 1881, is to incur a preventible evil,—that is to say, an evil which, whether prevented or not, could have been and ought to have been prevented by the application of known methods. A few hours of drying wind give some small comfort as we write. But again we ask,—Where are the inventions that promise to save and to dry the corn crop?

As the above was written, a notice in the columns of the *Morning Post*, calling attention to the hay-dryer, the invention of Mr. W. A. Gibbs, caught our eyes. By the process, the writer states, wheat, when seemingly worthless, can be restored to wholesome food, almost equal to malt for fattening. A report is quoted from the agent of the Duke of Northumberland as to the effect of the machine in drying hay, which seems to be its original object. The report states that colour and aroma are preserved, and that the hay is not scorched. Two tons an hour is the rate of drying. How far this applies to wheat, and what is the proposed application with regard to the wheat crop, we should be glad to hear. Can Mr. Gibbs give any facts showing the cost and the time that it would take to dry, in the sheaf, a hundred quarters of wheat? That is the way to put the case, as a matter of business.

THE ST. GOTTHARD RAILWAY.

THE SIMPLON AND MONT BLANC TUNNELS.

THE hundred and third report on the progress of the works of the St. Gotthard Railway, reaching to the end of the first half of this year, has just been published, and from it a very interesting picture of the state of this important undertaking may be drawn. The principal and most difficult work, as we are aware, is the tunnel through the St. Gotthard, of a length of 16,304 yards, or nine miles and a quarter. Its adit level has been driven this year, and more; the tunnelling has proceeded for 13,215 yards, and been completed for traffic for 12,174 yards. No fewer than 3,319 workmen are employed in the tunnel, work proceeding uninterruptedly night and day. The contract value of the work done is 2,180,000*l.*, leaving still to be finished work to the value of 85,000*l.* The quantity of compressed air used during the month of June for the rock-boring machines and the locomotives employed in the carriage of materials and *débris* was 5,981,444 cubic feet per day. The temperature in the centre of the tunnel was 29½ degrees C. (85 Fahr.), or 17 degrees more than outside the tunnel. The quantity of dynamite used daily was 567 lb. It may be remarked, in passing, that the temperature in the interior of the tunnel may possibly become lower, as has been the case in the Mont Cenis tunnel, where it has fallen 7 to 8 degrees C. during the last ten years.

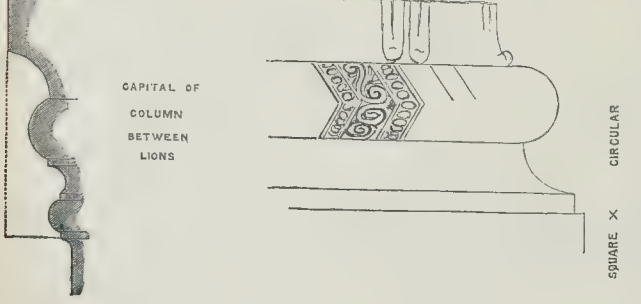
On the feeders of the St. Gotthard tunnel, of a total length of ninety-nine miles, and including the lines Immensee-Göschenen, Airolo-Biasca, Cadenazza-Pino, Giubiasco-Lugano, of the calculated 170,486,224 cubic feet of earth and rock, 91 per cent. had been removed or levelled; of the 10,085,512 cubic feet of brickwork and masonry, 83 per cent. had been executed by the end of June. Of the roadways of the fifty-one tunnels, of a total length of fourteen and a half miles, 89 per cent. had been completed. The fact that of the permanent way only 13 per cent. had been laid down has its explanation in the still numerous obstacles. But the above data show unmistakably that the great work is rapidly approaching completion. Within a very short space of time—it may be another year—

Germany will reap the fruits of the energetic efforts made by the representatives of the then North German Confederation at the Bern Conference in the autumn of 1869. The financial sacrifices made by Germany appear trifling compared with the advantages to be gained.

In the meantime, France is preparing to meet the threatening competition by substantial subventions towards the Simplon Railway. If the Mont Blanc project, born of and advocated for locally patriotic reasons,—according to which the northern entrance of the inevitable great Alpine tunnel would lie in French territory, instead of, as in the case of the Simplon tunnel, on Swiss soil,—had not come between as a disturbing factor, the Simplon Railway would, at this moment, have passed the introductory stages of construction. On the north side a completed railway reaches to the foot of the Simplon, at Brieg, in the Rhone valley, which at Lausanne and Geneva joins on to the great North Alpine railway network. On the south, the continuation of the Upper Italian Railway as far as Domo d' Ossola has been secured. There remains, therefore, only the mountain portion (10½ miles long, and estimated at 675,000*l.*) on the granite slopes of the Diveria, from Domo d' Ossola to the southern entrance of the Simplon tunnel at Iselle. The latter will be 11½ miles long, consequently exceed that of the St. Gotthard by 2½ miles, and has been estimated, including the cost for the northern approach and an international terminus at Brieg, at 2,320,000*l.* Of this sum, France is expected to contribute from 1,750,000*l.* to 2,000,000*l.* The Simplon line possesses the advantage, compared with the St. Gotthard and Mont Cenis Railways, of a lower altitude (its level is from 1,312 ft. to 1,640 ft. lower), as well as very convenient junctions. The route from Milan to Paris, compared with the two other lines, will, by the Simplon line, be shortened by 95 miles and 79½ miles respectively. These are reasons enough to justify the conclusion that the construction of the Simplon Railway will follow close upon that of the St. Gotthard Railway. Germany, however, has a start of at least ten years, and there appears to be every probability that she will make good use of her opportunity.

THE GATE OF THE LIONS.

SIR,—I noticed in your leading article (p. 257, *ante*) a reference to the mouldings of the capital between the lions at Mycenæ. I send to you, herewith, a sketch of them made by me a few months since.



I was at Mycenæ many years ago, but did not take any sketches, as I believed that my dear friend, Professor Donaldson, had given them in connexion with the other drawings of the gate which were published by him.

But, very singularly, these mouldings were omitted; and although I have lately consulted, for a special purpose, all the drawings which I could find of Mycenæ, I could find no section whatever of the mouldings.

To draw them with absolute correctness could be managed only from a ladder. My drawing was made from the top of the stone nearest to the carved block, and was verified by a companion who climbed up on the stone with me. I ought to add that I was then quite unconscious of the resemblance of the capital to the Ionic base, and it was not until I happened to look at the sketch its reversed way that I saw the singular resemblance.

So far as I know, it is the earliest specimen in existence, and if, as I strongly suspect, it is actually a copy of a base reversed, it is the very earliest, by very many centuries, known.

Next to it would come the bases shown in the Assyrian bas-reliefs.

In the little museum in which Dr. Schliemann (praise to him!) has preserved many remnants of the old work at Mycenæ, is a portion of a base to a semi-column (*vide* rough sketch), which I at once recognised as being of the same type as the one which Professor Donaldson has drawn at the entrance of the tomb, and which has long been lost.

Mr. Murray pointed out to me lately, at the British Museum, a small part of another of these bases.

A most interesting tomb of the same type as those at Mycenæ and Orchomenos has recently been discovered at Menidi, near Athens.

The Germans have published a plan and description; but, so far as I am aware, nothing beyond this has been made public.

It is very little known, and had it not been for the kindness of Mr. Murray I should have missed seeing it, as the local guides altogether ignore it.

Several details of it, such as the Egyptian method of attempting to relieve the lintel from the weight of the enormous mass above it, are peculiar and well worthy of attention; and, altogether, it would be difficult to find a more interesting vestige of the ancient races, existing, as it does, almost perfect within an easy walk of the Acropolis. T. HAYTER LEWIS.

TECHNICAL SOCIETIES IN HOLLAND.

ACCORDING to an article in one of our foreign contemporaries, there are only two technical societies of importance in Holland,—those for the development of engineering and architecture.

The "Koninklyk Institut van Ingenieurs" (Royal Institute of Engineers) was originally founded at Delft, but since 1860 has been domiciled at the Hague. A special branch has since 1851 been occupied with matters connected with the Dutch possessions in the East.

The Institute holds five regular meetings during the year, one of which is for the purpose of approving the annual report and electing officers. One of the meetings is usually held at some point other than the Hague, and is in connexion with the examination of some work of interest at the town selected. The society receives an annual grant from the State of about 70*l.*, and its property (including its library) was in the last report estimated at a value of about 1,000*l.* The membership of this society is regarded, it is said, as a mark of honour.

The career of the "Maatschappy tot Bevordering der Bouwkunst" (Society for the Development of Architecture) does not seem to have been in the past equally successful with that of the Institute previously referred to. Since its re-organisation last year it seems, however, to have taken a fresh start. Archæological researches come within its sphere of action. Its head-quarters are in Amsterdam, where it has its own premises. Meetings do not seem a strong point with this body, as only one general meeting annually and one excursion assembly are provided for by the statutes. Provision is, however, made for prize competitions of various kinds among the members.

THE INFLUENCE OF BAROMETRIC PRESSURE ON THE DISCHARGE OF WATER FROM SPRINGS.

THIS was the subject of a paper read before the British Association (Section C, Geology) by Mr. Baldwin Latham, M. Inst. C.E. He said that it was alleged, by some of the long-established millers on the chalk streams, that they were able to foretell the appearance of rainfall from a sensible increase in the volume of water flowing down the stream before the period of rainfall. He had, therefore, undertaken a series of observations to investigate the phenomena, and he found, in setting up gauges in the Bourne flow in the Caterham Valley, near Croydon, in the spring of this year (1881), and selecting periods when there was no rain to vitiate the results, that whenever there was a rapid fall in the barometer, there was a corresponding increase in the volume of water flowing, and with a rise of the barometer there was a diminution in the flow. The gaugings of deep wells also confirmed these observations; for where there was a large amount of water held by capillarity in the strata above the water-line at that period of the year when the wells became sensitive and the flow from the strata was sluggish, a fall in the barometer coincided with a rise in the water-line, and under conditions of high barometric pressure the water-line was lowered. Percolating gauges also gave similar evidence, for, after percolation had ceased and the filter was apparently dry, a rapid fall of the barometer occurring, a small quantity of water passed from the percolating gauges. The conclusion arrived at was that atmospheric pressure exercises a marked influence upon the escape of water from springs.

Professor J. Prestwich, who regarded the question as an exceedingly interesting and complicated one, took exception to some of the remarks of Mr. Latham as to the water zones. That gentleman, he said, had treated the subject in a very ingenious manner, but he (the speaker) did not feel they had sufficient evidence before them to determine the question, and he hoped that Mr. Latham would continue his inquiry, and that more importance would be attached to it.

Dr. J. Evans, F.R.S., who had given the subject much consideration, and had taken observations for some years, complimented the reader of the paper, who, he thought, had brought forward facts sufficient to establish his interesting theories. He gave an account of the results which had come under his own observation, and hoped that Mr. Latham would pursue his investigations, and endeavour to ascertain the amount of percolation in the chalk, and the quantity of water available from it for drinking and various other purposes.

Mr. Bateman, C.E., added his testimony to the remarks which had been made respecting the influence of barometric pressure, and spoke of the effects of rainfall upon the water-beds. He gave instances of the influences of the rainfall in different parts of England, and, in conclusion, said they were much indebted to Mr. Latham for his remarks, for they were the result of absolute observations, and might have an actual bearing in all cases where spring water is relied upon for the supply of towns. The observations were also of value as they were the record of facts which might be used in future for scientific purposes.

Mr. W. Topley stated that although they were indebted to Mr. Latham for his valuable paper, the subject was not a new one, it having been brought forward years ago by Mr. Bailey Denton, who had made interesting observations on the subject.

Professor Hughes asked the author of the paper whether he had taken into consideration the hygrometric conditions, as it appeared that he had observed that different flows coincided with the south-west and east winds. The difference in pressure on surface and subterranean waters due to evaporation of surface water under the dry east wind or moist south-west wind, would be so great that it should not be neglected in considering such small differences of actual pressure as are to be referred to the atmosphere.

Mr. J. Lucas, as a resident in the neighbourhood, Mr. Milne, and Mr. Scott, from the Meteorological Office, continued the discussion, the latter observing that Mr. Latham had distinctly proved his case in the paper he had read.

The Chairman (Professor Ramsey) said he had

listened to the paper with great interest. He had given the subject his careful consideration, and the result had been that he had been enabled to predict the state of the weather with tolerable accuracy.

Mr. Latham, in replying to what had been said, stated that, with regard to the remarks of Professor Hughes, he had considered the bearing of hygrometric influences. He had been led to make his observations a good deal as a sanitarian, on account of the knowledge that the town of Croydon was subject every few years to diseases, and which he believed arose from the water supply. There was no doubt that underground water had a wonderful bearing upon the public health of this country, and he hoped that in future more consideration would be given to the connexion of wells with health, for this would be found of great value in relation to the sanitary condition of the country.

ELECTRICITY AND POWER.

SIR WILLIAM ARMSTRONG, in his address to the British Association, as president of the section of Mechanical Science, inquired into the advantages that might be obtained over the steam-engine by resorting to electrical methods of obtaining power.

With regard to this important question, most people, he said, especially those who are least competent to judge, look to electricity as the coming panacea for all mechanical deficiency, and certainly the astonishing progress of electricity as applied to telegraphy and to those marvellous instruments of recent invention which the British Post-office claims to include in its monopoly of the electric telegraph, as well as the wonderful advance which electricity has made as an illuminating agent, does tend to impress us with faith in its future greatness in the realm of motive power as well. The difference between heat and electricity in their modes of mechanical action is very wide. Heat acts by expansion of volume, which we know to be a necessarily wasteful principle, while electricity operates by attraction and repulsion, and thus produces motion in a manner which is subject to no greater loss of effect than attends the motive action of gravity, as exemplified in the ponderable application of falling water in hydraulic machines. If, then, we could produce electricity with the same facility and economy as heat, the gain would be enormous; but this, as yet, at least, we cannot do. At present by far the cheapest method of generating electricity is by the dynamic process. Instead of beginning with electricity to produce power, we begin with power to produce electricity. As a secondary motor, an electric engine may, and assuredly will, play an important part in future applications of power; but our present inquiry relates to a primary and not a secondary employment of electricity. Thus we are brought to the question, From what source, other than mechanical action, can we hope to obtain a supply of electricity sufficiently cheap and abundant to enable it to take the place of heat as a motive energy? It is commonly said that we know so little of the nature of electricity that it is impossible to set bounds to the means of obtaining it; but ignorance is at least as liable to mislead in the direction of exaggerated expectation as in that of incredulity. It may be freely admitted that the nature of electricity is much less understood than that of heat; but we know that the two are very nearly allied. The doctrine that heat consists of internal motion of molecules may be accepted with almost absolute certainty of its truth. The old idea of heat being a separate entity is no longer held, except by those who prefer the fallacious evidence of their senses to the demonstrations of science. So, also, the idea of electricity having a separate existence from tangible matter must be discarded; and we are justified in concluding that it is merely a strained or tensional condition of the molecules of matter. Although electricity is more prone to pass into heat than heat into electricity, yet we know that they are mutually convertible. In short, I need scarcely remind you that, according to that magnificent generalisation of modern times, so pregnant with great consequences, and for which we are indebted to many illustrious investigators, we now know that heat, electricity, and mechanical action are all equivalent and transposable forms of energy, of which motion is the essence. To take a cursory view of our available sources of energy, we have firstly the direct heating power of the sun's rays, which as yet we have not succeeded in applying to motive purposes. Secondly, we have water-power, wind-power, and tidal-power, all depending upon influences lying outside of our planet. And, thirdly, we have chemical attraction or affinity. Beyond these there is nothing worth naming. Of the radiant heat of the sun I shall have to speak hereafter, and bearing in mind that we are in search of electricity as a cause and not an effect of motive-power, we may pass over the dynamical agencies comprised under the second head, and direct our attention to chemical affinity as the sole remaining source of energy available for our purpose. At present we derive motive-power from chemical attraction through the medium of heat only, and the question is, can we with advantage draw upon the same source through the medium of electricity? The process by which we obtain our supply of heat from the exercise of affinity is that of combustion, in which the substances used consist, on the one hand, of those we call fuel, of which coal is the most important, and on the other, of oxygen, which we derive from the atmosphere. The oxygen has an immense advantage over every other available substance in being omnipresent and costless. The only money value involved is that of the fuel, and in using coal we employ the cheapest oxidisable substance to be found in nature. Moreover, the weight of coal used in the combination is only about one-third the weight of oxygen, so that we only pay upon one-fourth of the whole material consumed. Thus, we have conditions of the most favourable description for the production of energy, in the form of heat, and if we could only use the affinities of the same substances with equal facility to evolve electric energy instead of heat energy there would be nothing more to desire; but as yet there is no appearance of our being able to do this. According to our present practice, we consume zinc, instead of coal, in the voltaic production of electricity, and not only is zinc thirty or forty times dearer than coal, but it requires to be used in about six-fold larger quantity in order to develop an equal amount of energy. Some people are bold enough to say that, with our present imperfect knowledge of electricity, we have no right to condemn all plentiful substances other than coal as impracticable substitutes for metallic zinc, but it is manifest that we cannot get energy from affinity where affinity has already been satisfied. The numerous bodies which constitute the mass of our globe, and which we call earths, are bodies in this inert condition. They have already, by the union of the two elements composing them, evolved the energy due to combination, and that energy has ages ago been dissipated in space in the form of heat, never again to be available to us. As well might we try to make fire with ashes as to use such bodies over again as sources of either heat or electricity. To make them fit for our purpose we should first have to annul their state of combination, and this would require the expenditure of more energy upon them than we could derive from their recombination. Water, being oxydised hydrogen, must be placed in the same category as the earths. In short, the only abundant substances in nature possessing strong unsatisfied affinities are those of organic origin, and in the absence of coal, which is the accumulated product of a past vegetation, our supply of such substances would be insignificant. This being the case, until a means be found of making the combination of coal with oxygen directly available for the development of electric energy, as it now is of heat energy, there seems to be no probability of our obtaining electricity from chemical action at such a cost as to supplant heat as a motive agent. Sir W. Armstrong then discussed the transmutation of heat economically into the more available form of electricity, and continued,—It is only the want of an efficient apparatus for converting heat into electricity that prevents our using the direct heating action of the sun's rays for motive power. In our climate, it is true, we shall never be able to depend upon sunshine for power, nor need we repine on that account so long as we have the preserved sunbeams which we possess in the condensed and portable form of coal, but in regions more favoured with sun and less provided with coal the case would be different. The actual power of the sun's rays is enormous, being computed to be equal to melting a crust of ice 103 ft. over the whole earth in a year. Within the tropics it would be a great deal more, but a large deduction would everywhere have to be made for absorption of heat by the atmosphere. Taking all things into account, however, we shall not be far from the truth in assuming the solar heat in that part of the world to be capable of melting annually, at the surface of the ground, a layer of ice 85 ft. thick. Now let us see what this means in mechanical effect. To melt 1 lb. of ice requires 142·4 English units of heat, which, multiplied by 772, gives us 109,932 foot-pounds as the mechanical equivalent of the heat consumed in melting a pound of ice. Hence we find that the solar heat operating upon an area of one acre in the tropics, and competent to melt a layer of ice 85 ft. thick in a year, would, if fully utilised, exert the amazing power of 4,000 horses acting for nearly nine hours every day. In dealing with the sun's energy we could afford to be wasteful. Waste of coal means waste of money and premature exhaustion of coal-beds. But the sun's heat is poured upon the earth in endless profusion,—endless, at all events, in a practical sense,—for whatever anxiety we may feel as to the duration of coal, we need have none as to the duration of the sun. We have, therefore, only to consider whether we can divert to our use so much of the sun's motive energy as will repay the cost of the necessary apparatus, and whenever such an apparatus is forthcoming we may expect to bring into subjection a very considerable proportion of the 4,000 invisible horses which Science tells us are to be found within every acre of tropical ground. But whatever may be the future of electricity as a prime mover, either in a dominant or subordinate relation to heat, it is certain to be largely used for mechanical purposes in a secondary capacity; that is to say, as the offspring instead of the parent of motive power. The most distinctive characteristic of electricity is that which we express by the word "current," and this gives it great value in cases where power is required in a transmissible form. The term may be objected to as implying a motion of translation analogous to the flow of a liquid through a pipe, whereas the passage of electricity through a conductor must be regarded as a wave-like action communicated from particle to particle. In the case of a fluid current through a pipe, the resistance to the flow increases as the square of the velocity, while in the case of an electric current the resistance through a given conductor is a constant proportion of the energy transmitted. So far, therefore, as resistance is concerned, electricity has a great advantage over water for the transmission of power. The cost of the conductor will, however, be a grave consideration where the length is great, because its section must be increased in proportion to the length to keep the resistance the same. It must also be large enough in section to prevent heating, which not only represents loss, but impairs conductivity. To work advantageously on the system a high electro-motive force must be used, and this will involve loss by imperfect insulation, increasing in amount with the length of the line. For these reasons there will be a limit to the distance to which electricity may be profitably conveyed; but within that limit there will be wide scope for its employment transmissively. Whenever the time arrives for utilising the power of great waterfalls, the transmission of power by electricity will become a system of vast importance. Even now, small streams of water, inconveniently situated for direct application, may, by the adoption of this principle, be brought into useful operation. For locomotive purposes, also, we find the dynamo-electric principle to be available, as instanced in the interesting example presented in Siemens's electric railway, which has already attained that degre of success which generally foreshadows an important future. It forms a combined fixed engine and locomotive system of traction, the fixed engine being the generator of the power and the electric engine representing the locomotive. Steam-power may both be transmitted and distributed by the intervention of electricity; but it will labour under great disadvantage when thus applied, until a thoroughly reflective electric accumulator be provided, capable of giving out electric energy with almost unlimited rapidity. How far the secondary battery of M. Faure will fulfil the necessary conditions remains to be seen, and it is to be hoped that the discussions which may be expected to take place at this meeting of the British Association will enable a just estimate of its capabilities to be formed. The introduction of the Faure battery is, at any rate, a very important step in electrical progress.

It will enable motors of small power, whatever their nature may be, to accomplish by uninterrupted action the effect of much larger machines acting for short periods, and by this means the value of very small streams of water will be greatly enhanced. This will be especially the case where the power of the stream is required for electric lighting, which, in summer, when the springs are low, will only be required during the brief hours of darkness; while, in winter, the longer nights will be met by a more abundant supply of water. Even the fitful power of wind, now so little used, will probably acquire new life when aided by a system which will not only collect but equalise the variable and uncertain power exerted by the air. It would greatly add to the utility of the Faure battery if its weight and size could be considerably reduced, for in that case it might be applicable to many purposes of locomotion. We may easily conceive its becoming available in a lighter form for all sorts of carriages on common roads, thereby saving to a vast extent the labour of horses. Even the nobler animal that strides a bicycle, or the one of fainter courage that prefers the safer seat of a tricycle, may ere long be spared the labour of propulsion, and the time may not be distant when an electric horse, far more amenable to discipline than the living one, may be added to the bounteous gifts which science has bestowed on civilised man.

THE SERPENT MOUNDS OF THE SCOTTISH BORDER.

THIS subject was treated of by Dr. Phené in a paper at the recent meeting of the British Association in York. After adverting to the persistent retention of curious customs, and the handing down from generation to generation the traditionary lore of ages long past, the author of the paper referred to some of those which were corroborated by ancient monuments of an unusual kind still famous on the Scottish border. These consisted of sculptured stones, earthworks, and actual ceremonies.

Quoting from former writers, from family pedigrees, and other documents, it was shown that the estates to which such strange matters as follow pertained had been held alternately by those claiming under the respective nationalities, or more local powers, and which, from their natural defensive features, must have been places of Border importance earlier than history records. The district is occupied by the descendants,—often still traceable,—of Danes, Jutes, Frisians, Picts, Scots, Angles, and Normans; and by a comparison of several of the languages of these people, as well ancient as now existing, and also of the Gothic, it was shown in relation to a particular class of the most curious monuments, that the Norse "ormr," Anglo-Saxon "vyrm," old German "wurm," Gothic "vaúrms," pronounced like our word worm; and the word "lint" or "lind," also German, and the Norse "linni," are all equivalent, and mean "serpent"; and in some cases the two words are united, as in modern German "lindwurm," and the Danish and Swedish "lindorm." On this, apparently, rested the names of some of the places having these strange traditions, as Linton or serpent-town, Wormiston or worm's (ormr's) town, Lindisfarne, the Farne serpent island, now Holy Island, &c., and also the various worm hills, or serpent mounds of those localities. It was curious that the contest (like that of St. George) was sometimes with two dragons, as shown on a sculptured stone in Linton Church, and on a similar stone at Lyngby in Denmark, in the churchyard, where there was a tradition that two dragons had their haunt near the church. From these and other facts, the author concluded that the contests were international, and in the case of two dragons, an allied foe, either national, religious, or both, was overcome. He showed from the Scottish seals that Scotland used the dragon as an emblem, apparently deriving it from the Picts; that the Scandinavians also used it; and that these nationalities were antagonistic to the Saxon. In the time of David I. of Scotland, the first great centralisation of Saxon power took place, and the powerful family of the Cumyns took apparently by conquest, at least two of the localities having these strange traditions. And as the political object was to suppress the Celtic and Scandinavian, or other local national feeling, there could be little doubt that, however they obtained them, the persons dispossessed were of one or other of the Northern tribes. Hence, probably, the Middle-age tradition of the slaying of the serpent or dragon, or the serpent or dragon bearer, on the Anglo-Scottish border. But he considered such traditions would hardly have originated through such conquests had not previous marvellous stories existed of the prowess and conquest by the dragon (bearers) of the lands they invaded, all the wonders of which would be transferred to the conqueror's conqueror. Hence these stories were not to be set aside with a sneer, as in them was a germ of history, giving us, perhaps, the only insight we could obtain of the prehistoric customs and mythology of some of the ancient tribes of Britain. Earthen mounds, tumuli, standing stones, &c., still existed in some of these localities, with all of which the dragon serpent or worm was associated in the legends.

The author then described his personal experiences in the still-existing dragon ceremonies in the south of France and Spain, which were always either on the present national or former less important provincial frontiers, and which still formed the subjects of great ecclesiastical ceremonies. These have been already referred to in our pages.

One of the high ecclesiastical dignitaries of the north of England—the Bishop of Durham—is in the position of having to take part in such a ceremony. Whenever a bishop of that diocese enters the manor of Sockburn for the first time, the Lord of the Manor, who holds under the see of Durham, subject to the following tenure, has to present the bishop, "*in the middle of the River Tees*, if the river is fordable, with the falchion wherewith the champion Conyers destroyed the *worm, dragon,* or *fiery flying serpent*, which destroyed man, woman, and child" in that district, and an ancient altar called "*Greystone*," still marks where the dragon was buried.

The subject was illustrated with views of all the places referred to on the Anglo-Scottish, French, and Spanish border counties.

ANCIENT DWELLINGS ON THE YORKSHIRE WOLDS.

To the Anthropological Department of the British Association meeting in York, Mr. J. R. Mortimer contributed an account of the discovery of six ancient dwellings found under and near the British barrows on the Yorkshire Wolds. Dwelling No. 1 was situated at the eastern end of the barrow, which was one of the long type. Its depth from the base of the mound was 6 ft. 6 in., with a floor surface of 9 ft. 6 in. by 7 ft. 6 in., and it was entered by two winding passages 24 ft. in length, the northern one being cut by the side trench of the barrow, showing in this case that the construction of the dwelling had preceded the excavation of the trench, and was therefore older than the barrow. In the material filling the dwelling and its passages were many streaks of burnt wood, a human femur, portions of an urn, and many animal bones, all probably the residue of feasting. A little distance from the dwelling were portions of three more dish-shaped urns, and traces of interments. Dwelling No. 2 contained similar remains, and in Nos. 3 and 4 were found bones of the red deer and the urus. No. 5 consisted of an inner and outer circle of upright posts. In the centre was an oval grave cut 4 ft. into the rock, and containing the flexed human remains of a large male. In front of his face lay a crushed food vase, and close to his left shoulder was a perforated axe hammer. Clayey matter covered the grave and extended to the outer circle of the post-holes. This was believed to be the residue of the sides of the dwelling, in the centre of which its owner was interred, and afterwards the walls were pushed down over the grave and covered with a mound. Mr. Mortimer suggested that the space between the two circles of uprights might have been used for storing heads of grain and other provisions for winter use at a time when man's dwelling was the only building he possessed for all purposes. No. 6 resembles No. 5. Small branches of oak, ash, maple, and other trees, thought to be the remains of the wattled sides of the hut, had left their impressions in the circular bed of clayey matter, some of which showed cuts made with the axe an the saw, seemingly of metal. The droppings from the eaves of this hut had stained the ground all round with colouring from the thatch of the roof, which probably was the straw of wheat, for Mr. Mortimer possessed carbonised grains of this cereal from the primary interment of an undoubted British barrow near. Until the previous dwelling, the occupier had not been interred within the walls of this circle, but just a few feet outside, towards the rising sun. It was accompanied by a delicately-formed flint-knife, lying close to the right arm, and a finely-ornamented food-vase near the head. As in the previous case, the dwelling had been crushed down at the time of interment, and carefully covered with the barrow, showing but a step between the habitation of the living and the house of the dead.

A VIKING'S SHIP.

IN the Department of Anthropology, York meeting of the British Association, Mr. J. Harris Stone read a paper on the Viking ship discovered at Sandefjord, Norway, in 1880. Instead of an antiquated, rudely-constructed, and roughly-finished vessel, with primitively-drawn lines, it was a smart, trim-looking craft, built on what a sailor would call beautiful lines, and was admirably adapted as well for speed as for general seaworthiness. It was difficult to conceive of such a fresh-looking and well-preserved ship being, as it was undoubtedly, about a thousand years old. He feared that the discovery of this ancient galley had not given them any argument in favour of the theory of the growing superiority of mankind in all branches of knowledge and industry. There were no means of knowing whether this ship was or was not concerned in the raid of the Vikings and their followers on our coasts. They plagued Scotland with varying success until 1014, when a treaty was made between Malcom and King Swene, of Denmark, the result of the plucky and steady resistance of the Scotch. The name of the Viking owner of this ship was not known. All that could be said was that he lived at some time during the period from the end of the eighth to the middle of the eleventh century, and that when he died he was buried in his vessel, which was drawn up on land, and had a mound of earth thrown over it, which, luckily for posterity, consisted of blue clay. The vessel which Frithiof beautifully apostrophised, and which entered so largely into the Saga associated with his name, was doubtless a galley similar in all respects to this one. The vessel was now at Christiania. It was excavated at Gdestad, Sandefjord, about half a mile from the present seashore. In this ship the sepulchral chamber in which the Viking's body had been deposited was situated amidships. It was tent-like in shape, made of logs placed side by side, leaning and meeting on a ridge, the side running parallel with the main axis of the ship. The mound appeared to have been entered, no doubt for the purpose of plunder, for none of the Viking's weapons were found, and only a few of his bones were discovered. There were found in the sepulchral chamber the bones and feathers of a peacock, the bones of a little dog, some fish-hooks, and several mountings to belts and harness. Round about the ship were discovered the bones of some nine or ten horses and dogs, which had been sacrificed at the time of burial. The vessel was 77 ft. 11 in. in length between the rabbets at the gunwale, and at the widest part 16 ft. or 17 ft. across. From the top of the keel to the gunwale amidships she was 5 ft. 9 in. deep. She would draw probably not 4 ft. of water, and she had twenty ribs. She was clinker-built, and her planks slightly overlapped, like slates on the roof a house. Her lines were calculated for swiftness as well as for seaworthiness. The planks and timber of the frame were fastened together with withes of tree-roots. The bent timbers seemed to be naturally grown, and not artificially bent. The boards of the sides were of good, sound, well-seasoned, and selected oak, about 1¼ in. in thickness. They were smoothly planed, and firmly riveted together by iron rivets, which had been carefully clinched on either side. There were also a few oaken bolts near the upper part of the sides. He could find no trace of a saw having been used anywhere about the vessel. The planks had their edges moulded. The mouldings consisted of indented lines running down the length of the planks near the lower margins. Bow and stern were of similar shape. They were painted, and must have risen a considerable distance out of the water. The top of each was broken, so that it could not

now be determined whether she originally carried a figure-head or not. The keel was deep, and made of thick oak beams. He could not see whether any metal keel had been fastened to the bottom. In the Frithiof Saga, however, "the ball of copper" was spoken of, and he presumed that there might have been something similar in this vessel. An iron anchor found with the vessel had so rusted away that it could not be preserved. There was no deck to the galley, and the absence of seats for the rowers was notable. The flooring could be lifted to allow of baling out water. The oars were 20 ft. long, and the oar holes, sixteen on each side, had slits towards the stern of the vessel to allow the blade to pass through from the inside. The most interesting thing about the ship was the rudder, which was on the starboard side, a foot or two from the stern. Starboard was a corruption of the word "sturboard," which no doubt owed its origin to the ancient position of the rudder, as in this galley. This rudder resembled a large oar, consisting chiefly of blade and a short handle. It was fixed not to the side of the boat directly, but to the distal end of a piece of conical wood, which projected about a foot from the vessel. This piece of wood was bored down its length, and no doubt a rope passing through it secured the rudder to the ship's side. The steering was effected by a tiller fixed in a hole at the upper end of the handle portion, and probably also by a rope fastened at the lower end of the blade. It was hoped that the correct shape of this galley, which was photographed, would rapidly circulate among artists, and for ever put an end to the curious drawings and paintings of the Viking galleys. The vessel had one mast. In the mound were also found parts of three small oaken boats, generally like a galley itself, a large well-made sheet copper caldron, a few bedsteads like those used in Norway in the present day, some drinking-cups and tubs, and some pieces of carved and painted wood, the use of which is uncertain. Several large round shields of thin wood were also found. These could not have been for defence, but must have been for ornament. A landing-stage made of oak was also found in the mound. The surface of this plank is carved ornamentally, to prevent slipping, and many on seeing the photographs and diagrams would turn their thoughts to the Bayeux tapestry in Normandy, in which were numerous representations of galleys similar to the one now described. The discovery of this galley throws a flood of quite unexpected light upon a period of history which is, perhaps, as dark and obscure as any during historic times.

CHEAP GAS FOR GAS-MOTORS.

MR. J. EMERSON DOWSON, C.E., read a paper on the economical effect of using cheap gas for gas-motors, &c., before the Mechanical Science section of the British Association. In it he described an apparatus invented by him for producing cheap gas, and gave some notes on the economical effect of using such gas with gas-motors, &c. Having reviewed what had already been done to produce a cheap heating gas, the writer stated that he had devised an apparatus which was small in size and easy to work. The apparatus was described in detail. The quantity of water required was very small, being only about seven pints for each 1,000 cubic feet of gas, and except on the first occasion when the apparatus was started, the coil was heated by some of the gas drawn from the holder. For boiler and furnace work the gas could be used direct from the generator; but where uniformity of pressure was essential,—as for gas-engines, gas-burners, &c.,—the gas should pass into a holder. The nature of the fuel required depended upon the purpose for which the gas was used. The cost of making the gas depended to a great extent on the size of the generator; but for three sizes made, the total cost of production for 1,000 cubic feet was 4¼d., 3¼d., and 2¾d., respectively, after allowing 1s. to 1s. 6d. per day for wages. Experiments with the Dowson gas with the Otto gas-engine had proved that one-horse power (indicated) per hour was obtained with a consumption of gas derived from 1·46 lb. of coal, after allowing 10 per cent. for impurities and waste of the latter. Thus, by using the writer's gas a small gas-engine could compete favourably in fuel consumption with the largest and best steam-engines, and a very important saving could be effected when compared with steam-engines of moderate size and of the usual type. The paper concluded with a few words as to other purposes for which the author's gas could be used, and as to its calorific power for heating generally.

Sir F. Bramwell said he was glad to see any method put forward for using the energy in coal. The Otto gas-engine was exceedingly useful, and could be worked with economy. Unless some great improvement could be made in the steam-engine, that was the way in which they would in the future use their fuel. Again, they would not have boiler-explosions. Gas explosions were comparatively rare; but boiler explosions occurred from time to time, and caused about eighty deaths per annum.

SUBSIDENCES IN LAND.

IN the Geological Section of the British Association, a paper on "The Subsidences above the Permian Limestone between Hartlepool and Ripon," by A. G. Cameron, of the Geological Survey of England and Wales, was read by Mr. Topley. In this paper attention was drawn to the numerous forms of shrinkages of the land-surface, often extending to considerable depths into the rocks beneath, observable over the top of the Permian rocks betwixt Hartlepool and Ripon. As a general explanation of their origin, it was suggested that where the underground water, flowing over the limestone surface, reached the margin of the sandstone, it received a check, whereby it accumulated, forming a chain of dams or pools along the line of junction of these rocks. As denudation proceeds, hollows form above, until ultimately the phenomena of the pits appear. This being so, "the water bubbling and frothing all over" was explained without calling in the aid of river-action. Allusion was made to the Home Farm Colliery accident at Hamilton, N.B., in February, 1877, through a subsidence in the gravelly alluvium of the Clyde; also to the recent subsidences at Blackheath, near London; and to the extensive caverns in the hematite districts of Furness.

Mr. W. Whitaker referred to the subsidence at the Blackheath Pit, to which allusion was made in the paper, and expressed his opinion that it was due to artificial rather than natural causes.

Professor E. Hull, F.R.S., stated that great anxiety prevailed in the neighbourhood of Ripon in consequence of the subsidences which had taken place, and he said he should like to know from Mr. Cameron or any one else whether there was a possibility of a large hole being formed under the beautiful cathedral at Ripon, to the destruction of the towers or some part of that edifice.

The Rev. W. H. Oxley, of Grewelthorpe Vicarage, who had witnessed one of these subsidences, which he explained was from 80 ft. to 100 ft. deep, and 200 ft. in diameter, said that he did not think there was any fear, humanly speaking, of any danger occurring to Ripon Cathedral from the cause alluded to.

THE DEVELOPMENT OF THE COLOUR SENSE.

IN Section D, Biology, of the British Association meeting, Dr. Montagu Lubbock read a paper on "The Development of the Colour Sense," in the course of which he said that authors had generally considered the point at issue to be this,—"Is there sufficient evidence to show that the power of perceiving colour has been acquired by man within historical times?" He would extend the question further, and ask, "Is there evidence to show that the power of perceiving colour has been gradually acquired at any time, not only by man in historic or pre-historic times, but by the animal kingdom at large?" He proceeded to treat the question by dividing it into four parts, considering first of all in what the "colour sense" or "perception of colour" consists. He then briefly recalled what had been written on the subject, and the arguments which had been brought forward to prove that the power of appreciating colours had been gradually developed. Having commented on these arguments and considered their value as to the point at issue, he stated the conclusion which must be arrived at on the question. He said reasons more or less conclusive had been given for believing that, as far as man was concerned, no such gradual development could be shown to have taken place. To what conclusion must we come as to such development occurring in the animals of past ages? They had seen that the power of appreciating colour would become more and more perfect in those animals which lived upon coloured food; the same statement, however, might be made with respect to the power of distinguishing form, and there was no evidence to show that the improvement took place in one direction earlier than in the other. Neither did any proof exist that colour perception has been handed down with gradually increasing perfection from one species to another of the animal kingdom. If everything had reached its present form, its present condition, by evolution, colour perception must have done the same, but as yet there was no evidence to show how and through what stages this evolution took place.

Professor Foster having expressed his concurrence with the views of Dr. Lubbock,

Sir John Lubbock, in his comments on the paper, expressed the opinion that the conclusion to which Dr. Lubbock had come was fully warranted by the facts.

A LITERARY BRICKLAYER OF THE SEVENTEENTH CENTURY.

A FEW years ago we gave in the *Builder* some brief notes of a book on building matters, written by one Venterus Mandey. We were unable at the time to furnish any particulars of the author, who was a builder's workman, or bricklayer, as were his father and grandfather before him. We find that Mandey was buried in Ivor Church, Bucks, and his epitaph is given in Le Neve's "Monumenta Anglicana," 1719, which furnishes a brief epitome of his life, and shows that he died in 1701. The epitaph is worthy of reproduction in its entirety, and runs thus:—

"Beneath this place lyes interred the Body of VENTERUS MANDEY, of the Parish of St. Giles in the Fields, in the County of Middlesex, Bricklayer, Son of Michael Mandey, Bricklayer, and Grandson to Venterus Mandey, of this Parish, Bricklayer, who had y^e honour of being Bricklayer to the Hon^ble. Society of Lincoln's Inn, from the year of our Lord 1667 to the day of his death. He was Studious in Mathematics, and wrote and Published three Books for Public good, one Entituled 'Mellificum Mansionis; or, the Marrow of Measuring;' another of 'Mechanic Powers; or, the Mystery of Nature and Art unvayled;' a third, 'An Universal Mathematical Synopsis.' He also translated into English, 'Directorium Generale Uranometricum,' and 'Trigonometra Plana et Spherica, Linearis et Logarithmica,' 'Auctore Fr. Bonaventura Cavalerio Mediolanensi,' and some other Tracts which he designed to have Printed if Death had not prevented him. He dyed the 26th day of July, Anno Domini 1701. Aged 56 years and upwards. He also gave Five Pounds to the Poor of this Parish."

Mandey's "Mellificium Mensionis; or, the Marrow of Measuring," appears to have been first published in the reign of Charles II. In it "a new and ready way is shown how to measure glazing, painting, plastering, masonry, joyners', carpenters', and bricklayers' works," &c. A third edition, with additions (which appears to be a reproduced third edition), issued several years after the author's death, is before us. There is a frontispiece characteristic of the period, representing the author with flowing locks, and a necktie expanding into a tuft of folds upon his breast, with this inscription underneath, "Vera Effigies Venterа Mandey, Etatis Suæ 37 Anno 1682." The volume before us includes "A Garden of Geometrical Roses," &c., and "Some Principles and Problems in Geometry," &c., both originally written in Latin by Thomas Hobbes, but "done into English by Ven. Mandey." The Appendix contains a tract by the author on the "Measuring of Chimneys Reformed." Mandey mentions elsewhere in his book, when treating of glaziers' work, that for those who desired to measure in the decimal way, "I refer them to a Treatise put forth by my friend, Tho. Hammond, *A New and Exact Way of Mensuration*, which I writ for him when I was Apprentice." It will be seen from this that our "seventeenth-century bricklayer" imbibed a literary taste early in life.

To illustrate the method of measuring bricklayers' work in his time, and to assist young practitioners in making an estimate from a given design, Mandey furnishes a ground-plan of a building (no cellars or other rooms being beneath). This seventeenth-century plan is not unworthy of passing notice. There is a frontage of 25 ft. and a depth of 40 ft. The front and rear walls are 2½ bricks thick, and the two rooms, one front and one back, are each lighted by two windows, 4 ft. wide and 6 ft. 6 in. high. The flank walls are 2 bricks thick, and the story 11 ft. 6 in. to the top of the next floor. The door cases in front and rear are 4 ft. wide, and 9 ft. in height. The chimneys stand back to back, and flanking their sides; the stairs

start at right angles to, and nearly midway in, the passage that runs directly from the front to the back door. The enclosure of the stairs, as well as the partitions of the front and back rooms next the passage, are of timber, or intended as such, the style of the period being framed wainscoting and panelled work. Mandey shows young bricklayers how to set out brick arches, circular and elliptical, and to get out their "sommering moulds," and there is no question, considering him in the light of his time, he was a clever, clear-headed, and practical workman. The following, among others, will illustrate the orthography of some building terms in the seventeenth century, as we find them in Mandey's book:—"Plat" for plan, "rear" for rear, "jaums" or "jaumbs" for jambs, "sommering" for sammering, "plaistering" for plastering, "facio" for fascia, "lintol" for lintel, "tarsel" for tassel, "hipt" for hipped, "molding" for moulding, "quines" for quoins, "eves" for eaves, "hanse" for haunch, "center" for centre, &c. Some of the seventeenth-century terms are the proper ones, but the orthography of ordinary words, as well as technical ones, has undergone strange changes in a century, not to speak of those indicated above as belonging to an earlier period. Notwithstanding the advance of technical education, there are not many bricklayers at the present time in the British Islands (leaving literary acquirements aside) who understand their craft as well as it was understood and practised by Venterus Mandey.

BUILDING NOTES FROM THE WEST OF ENGLAND.

The general depression in trade has been, in the past year or two, severely felt by the building trade in the West of England, and business, though perhaps not so bad as it was a short time ago, is not what those engaged in it could wish it to be. House-building, especially of the speculative character, is, compared with what it was five or six years since, at a standstill, and such a large number of houses in all districts are void, that there does not seem a prospect of a speedy revival in this department. In some of the large and poor parishes of Bristol nearly 10 per cent. of the houses are uninhabited; but, rather singularly, though rents have been reduced, owners, unless suffering from special pecuniary pressure, do not seem willing to lower their selling prices. Amongst the more important works in Bristol and the West, which are now in hand or have just been completed, may be mentioned the following:—

The addition of a wing to the Bristol General Post-office is the principal feature in a series of new arrangements which are being carried out for the more convenient transaction of the business in the various departments. The old accommodation has long been found insufficient, and in the alteration not only has the present need been considered, but provision has been made for the parcel-post system, which is to come into operation in a couple of months. The wing has been erected by Messrs. Stephens & Bastow. The ground-floor is used for money-order, savings-bank, life assurance, and annuity business; and the upper portion, which is connected with the main building, is made into a letter-carriers' room. The new building is neat and appropriate in design, and its erection will greatly facilitate the growing work of the office.

Extensive baths and washhouses are to be erected at Jacob's Wells by the Corporation of Bristol. The designs have been prepared by Mr. Josiah Thomas, the city surveyor, and arrangements have been made in them for forty-eight baths,—viz, thirty-six for males and twelve for females,—and for fifty-two washing compartments. All conveniences in the way of machinery for washing, drying, ironing, &c., have been provided. The swimming-bath will be 80 ft. by 49 ft. The total cost has been estimated at 20,000*l*. Application for tenders having been made to twenty-eight of the leading contractors in London and the West of England, that of Mr. A. Krauss, of Bristol, for 15,107*l*., has been accepted. For the mechanical engineer's work tenders have also been received, and that of Messrs. W. J. Fraser & Co., for 3,535*l*. is accepted. In addition to these contract prices 1,117*l*. has been expended in building the retaining wall. The site cost nearly 4,000*l*., so that the work altogether will be an expensive one.

The Bristol Town Council has been ordered by an arbitrator, to whom the matter was referred, to pay 9,639*l*. to the London and South-Western Bank for a piece of ground given up by them (the Bank) in Corn-street and Small-street. The site of the new bank was obtained by pulling down St. Werburgh's Church, afterwards erected in a growing suburb, the tower of which projected on the pavement of Corn and Small streets. The Banking Company, having bought the site, claimed 13,000*l*. for the bit of ground they were compelled to give up. The new bank, a handsome structure as originally designed, is marred by being unfinished on the Small-street side, the stoppage of work being in consequence of a complaint that the lighting of the adjoining commercial rooms would be interfered with if the plans were carried out in their entirety.

The Bristol School Board has just decided upon building another Board school, and have authorised the purchase of half an acre of land for 1,000*l*. near Newfoundland-road, one of the poorer districts of Bristol. The school will accommodate 300 boys, 300 girls, and 200 infants.

An effort having been made to raise the south-west tower of Bristol Cathedral to the same level as the north-western, so as to give due effect to the new western porch, subscriptions were forwarded to the dean, and the work has now been commenced by the contractors, Messrs. Booth.

Messrs. Jones & Co. and Messrs. Baker & Co., two of the large Bristol drapery and fancy goods firms, have materially improved the appearance of Wine-street by additions to their premises. The former's new building is by far the more imposing of the two, and its external architectural arrangements are agreeable. Messrs. Fripp & Saunders supplied the designs.

As a kind of set off against the recent electric lighting experiments, which by the way resulted in nothing as far as permanent use is concerned, the Bristol Gas Company are trying at their own cost Sugg's burners over a mile and a half of roadway leading from the railway station to the Victoria Rooms. Kitt's drum-like reflecting arrangement has been used for some time on part of this route, but pedestrians and drivers pronounce it unsatisfactory.

The Parish Church of Mathern, a village near Chepstow, is being restored. Mathern is remarkable as the burial-place of Theodrick or Teudrick, the hermit king of Glamorgan, who, it is stated, having resigned his kingdom to his son Maurice, led an eremetical life amongst the rocks of Dydyrn. He was, however, dragged from his hermitage to command an army against the invading Saxons, under Ceolwulph, king of Wessex, in the year 600, in the belief that, having always conquered his enemies, he would again. He was victorious, but was slain in the conflict in the Vale of Tintern. A plain mural tablet in the chancel of the present church gives particulars of his death. The estimated cost of the restoration of this interesting church is 2,500*l*.

The Gloucester tramways have been transferred to a new company, the promoters of which are the same as those interested in the Bristol and Bath systems. Important alterations and additions have been made, the expenditure being about 16,000*l*.; the sum, however, represents an actual expenditure during the last two years of 32,000*l*. Mr. A. Krauss, of Bristol, was the contractor for the alterations.

A new Board school has been opened at Newport by the School Board of that town.

Steps are being taken to provide a winter garden for Weston-super-Mare. The estimated cost is 5,000*l*.

A new chapel is in course of erection in the Claremont District, Bath, for the Primitive Methodist denomination, the memorial stone having been laid by Lady Hayter. The dimensions will be 39 ft. by 43 ft., with five class-rooms beneath. At the rear will be a school-room, 18 ft. by 36 ft. Accommodation will be afforded in the chapel for 250 worshippers. The design is simple, and Mr. Bladwell has been given the contract for 1,100*l*.

The work of building a new church, to be dedicated to St. John the Evangelist, has been commenced at Charfield, the old church, having a history of 600 years, proving inconvenient and insufficient for the changing condition of the neighbourhood. The new building will be in the Early English style, and will be of local stone with freestone dressings. The roof is to be covered with Broseley tiles, and the bell-turret, in the absence of a tower, will be roofed with oak shingle. The length of the building will be 78 ft. in the clear, and the width 29 ft. There will be a vestry on the south-east side, and an organ-chamber on the south side. The porch will be at the north end. The floors will be wood, the aisles of plain tiles, and the pews of oak. The roof woodwork will be pitch pine, and the pulpit will be of oak on a stone base. It is intended to use the old churchyard as a cemetery and the church as a mortuary chapel. The new building is planned to seat 260 persons, and the cost is expected to be 2,500*l*. Mr. William W. Bethell, of Westminster, is the architect, and Messrs. Cox & Gyde, of Stroud, are the builders.

A new church,—St. Andrew's,—has just been completed at Rowbarton, near Taunton. It consists of nave with clearstory, north and south aisles, chancel, vestry, south porch, and tower. The latter is placed at the east end of the south aisle, and the lower stage of it is open to the church. The style of architecture is that of the Early Decorated period. The walls are of West Leigh stone in random courses, lined internally with brickwork, and the dressings are of Doulting stone. The whole of the interior is of brick. The piers supporting the arcades are made of bricks specially manufactured at Chudleigh-road; the other bricks are of Bridgewater manufacture, red and yellow ones and black tiles being arranged in patterns. The roofs are open timbered, plastered between the rafters, and covered with plain tiles of two colours. The plastering is relieved by stencilled ornamentation applied when the mortar was wet. The seating will be of pitch pine, and will be for nearly 500 persons. The chancel and passages are paved with Minton's tiles; the reredos is also of tiles manufactured by Messrs. Craven, Dunnill, & Co. The chancel windows and those of the clearstory have painted glass, by Hardman. The pulpit and font are of Beer stone. No carving or ornamentation has been introduced into the building, but it is ecclesiastical in character. The tower is surmounted by a timber-framed spire, with pale green Westmoreland slates, and rises to a height of 100 ft.; it is capped with a gilded weathercock. The cost of building is about 3,000*l*. Mr. J. H. Spencer, of Taunton, was the architect, and Mr. H. J. Spiller the contractor.

FROM ABROAD.

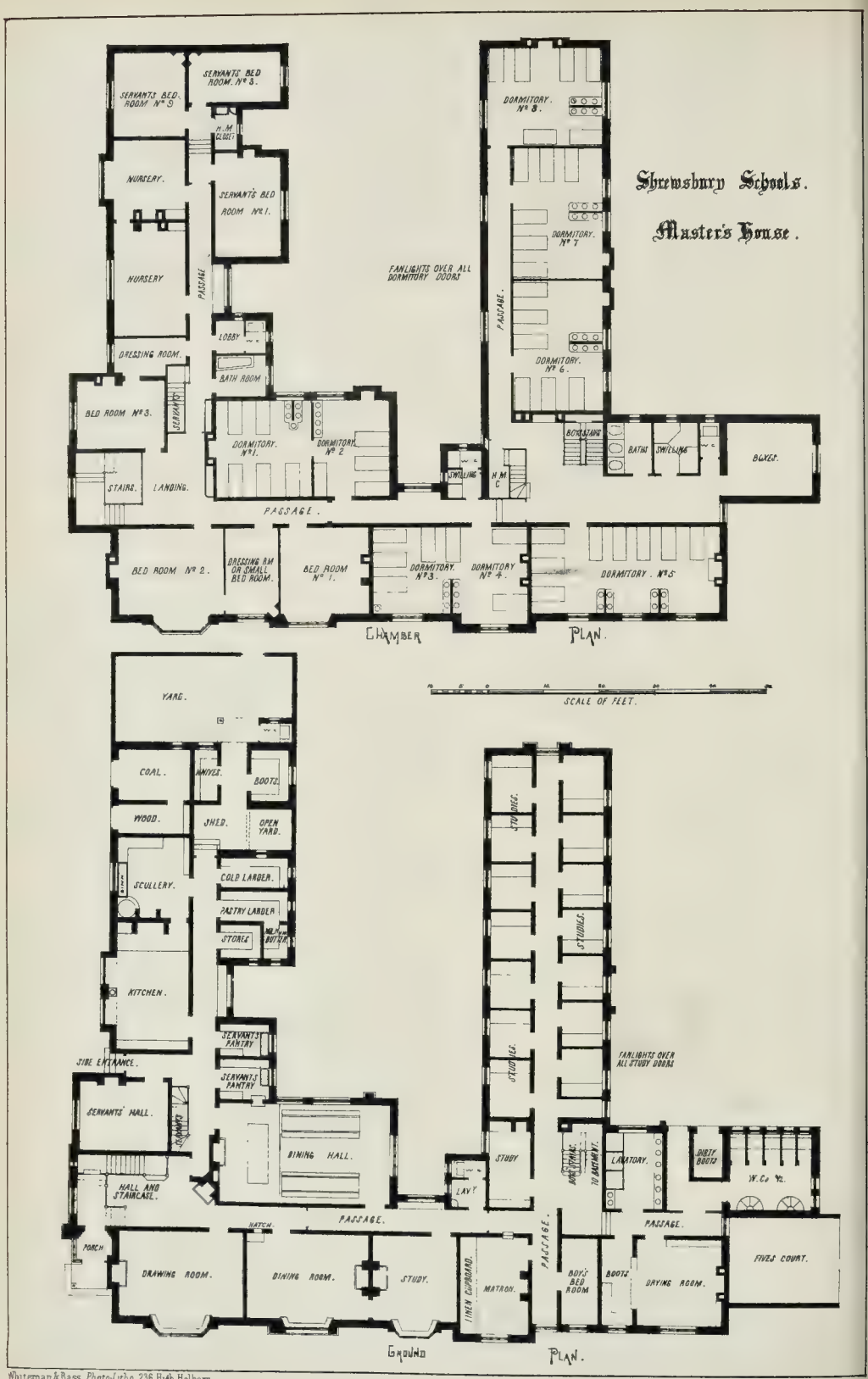
The harbour works at Stade, which were commenced eighteen months ago, are now approaching completion, and include a quay wall 700 ft. in length. Two cranes, each able to lift two tons and a half, have been erected, and a third, of three times this strength, is being put up. In order to make the harbour of a suitable depth for the tonnage it is meant to accommodate, a steam dredger has for some time been in operation.

The correspondent at Sofia of the *Kölnische Zeitung* calls attention to the position which German architects have recently acquired in that city, and to the steadily increasing demand for glass, cast-iron work, marble work, wire, &c., of German manufacture, in place of the Austrian and English goods which used to have almost a complete control of the market. The new building for the Russian consulate has been built, he says, by a German contractor under a German architect, and from German materials to a large extent.

The German press has been calling attention to the compressed paper for railway carriage wheels, made by Messrs. Adt, of Farbach, which, as to the various qualities requisite for the purpose, is supposed to be superior to wood. On account of its non-conducting properties, it is said to be of special value for electric railways, and for tram-car wheels its suitability is said to be great.

The garrison church at Metz (lately completed) has been in course of erection since the 18th of August, 1875, when the foundation-stone was laid. The total cost has been about 1,250,000 marks, or over 60,000*l*. The German papers speak highly of the work.

A Sanitary Protection Association for Portsmouth, which is intended to undertake the supervision of the drainage arrangements of private houses, so as to ensure their proper sanitary condition, was started at a meeting held on the 5th inst., under the chairmanship of the ex-mayor, Mr. Alderman Cudlipp.



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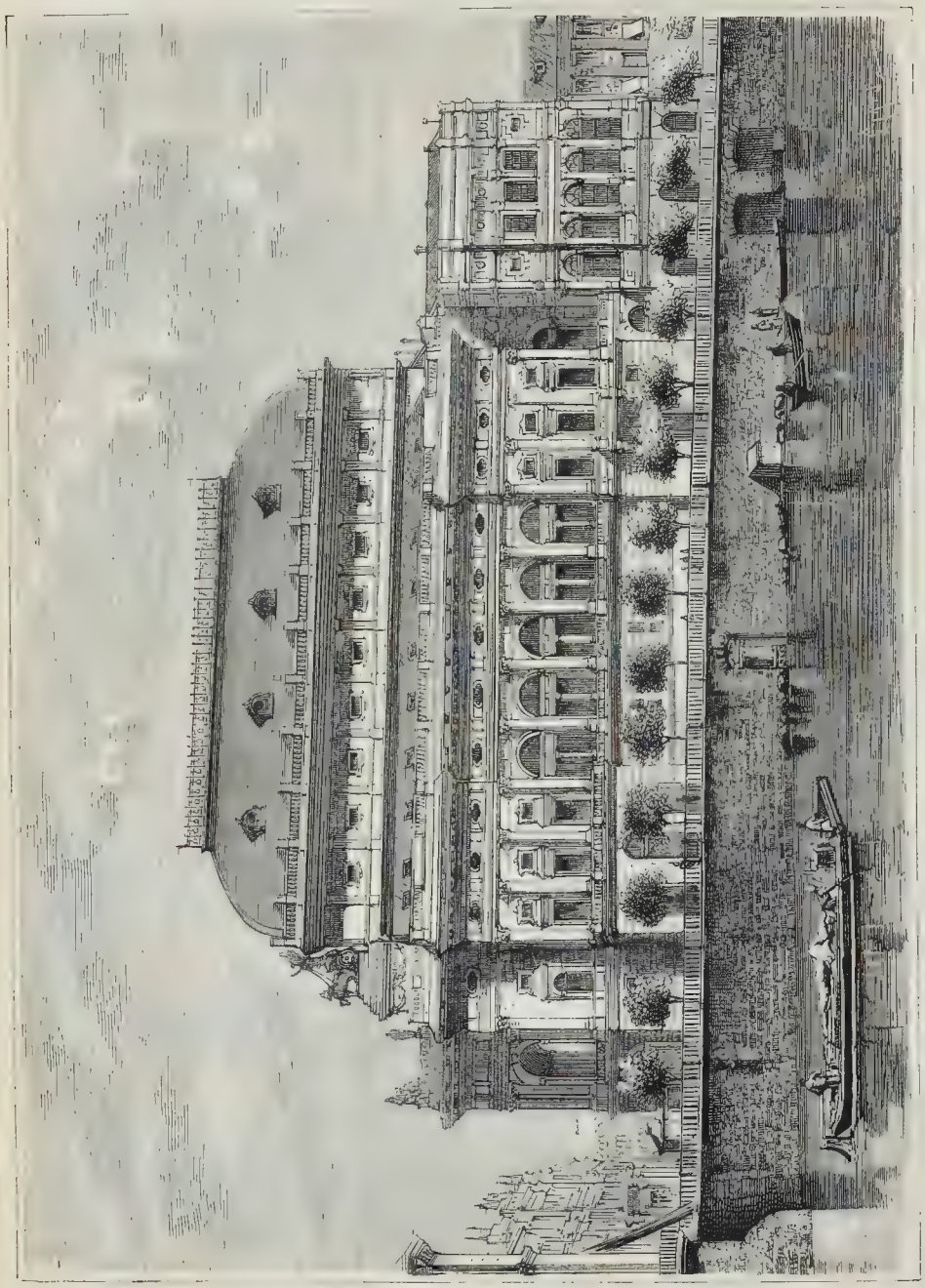
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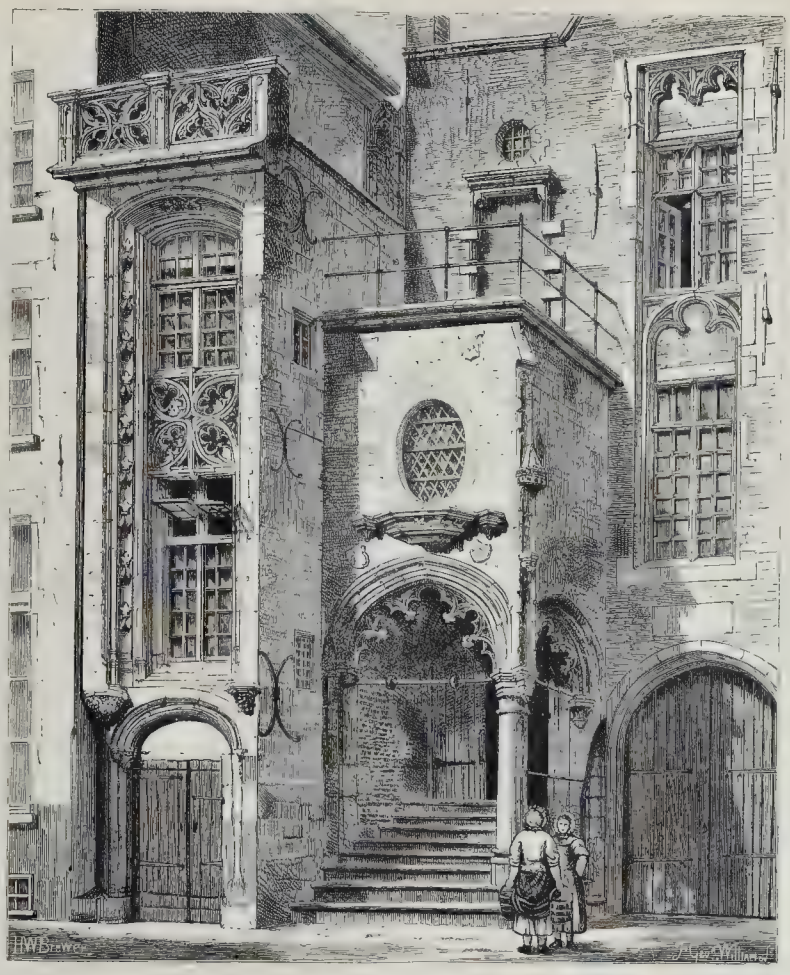
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SHREWSBURY SCHOOLS: MASTER'S HOUSE.—Mr. William White, F.S.A., Architect.

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THE NATIONAL THEATRE, PRAGUE.



MEDIÆVAL STREET ARCHITECTURE: HOUSE IN BRUGES.

End of Fifteenth Century or Beginning of the Sixteenth.

SHREWSBURY SCHOOL: MASTER'S RESIDENCE.

THE Shrewsbury School has been removed from its old site across the river to Kingsland. The destination of its old picturesque and characteristic buildings is not yet known. It is now to occupy the large building formerly erected as a charitable institution, and subsequently used as the Union Workhouse. The headmaster's house has been built in the "Queen Anne" style by Mr. Blomfield, and those for two assistant masters by Mr. William White. One of these is given in our illustration. It is built of local red brick, with quoins and moulded arches and other dressings of pressed red bricks. It is covered with plain tiles of brindled tint. It will be seen from the plan that the boys' and the domestic portions are in two distinct wings, with the dining-hall between. The studios are arranged each to take three boys. The studies and dormitories are to be warmed by a circulating system of heated air, combined with the constant provision of pure air.

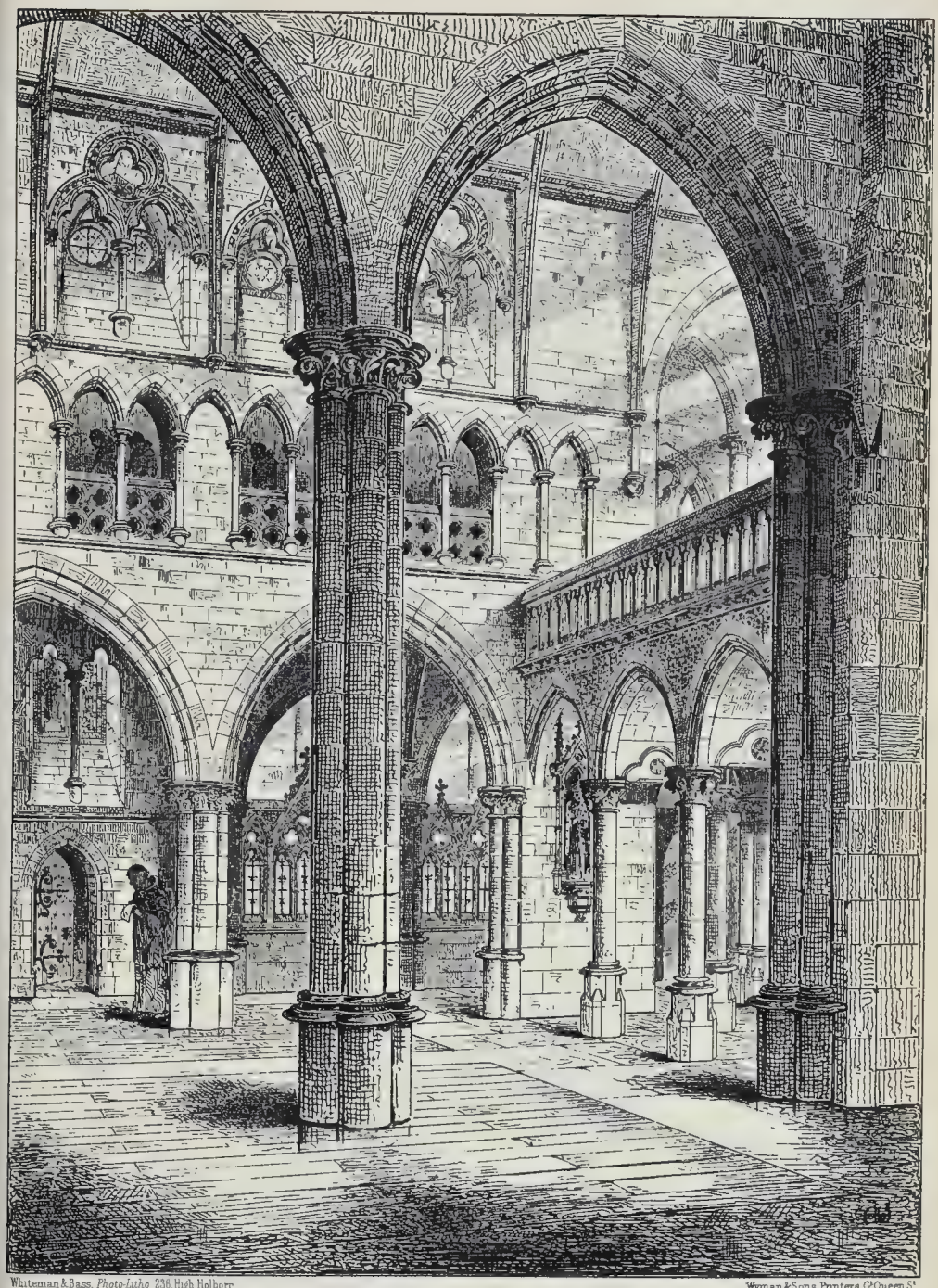
HOUSE IN BRUGES.

THE sketch we give of an old house at Bruges is an elegant example of the domestic architecture of the Low Countries. The date is not clearly ascertainable, but it may be presumed to be a work of the latter end of the fifteenth century, or possibly of the first few years of that which followed. The insertion of the windows into long sunk panels is a favourite device in Belgium, and is at once a cheap and effective method of giving ornament and light and shade to a large gabled front. It is, of course, one of those things which can easily be overdone, and requires a certain delicacy of treatment to look thoroughly satisfactory.

From a constructive point of view, the porch shown is not above criticism, as the thrust of the cusped arch has nothing to sustain it, and is dependent upon an iron tie to prevent its forcing the column which supports the angle of the building out of perpendicular. The builders, however, had the honesty to show this weakness, and, knowing that an iron tie was necessary, they made it a feature of the design. There are traditions at Bruges that Van Eyck and Memling lived in this house, but we were unable to obtain any reliable information upon the subject.

THE NATIONAL THEATRE, PRAGUE, BOHEMIA.

THIS theatre, which had been ten years in building, and was opened about four months ago, was destroyed by fire in August last. The loss is estimated at about 100,000*l*. Its large size and grandiose effect justified the inhabitants in considering it one of the most important monuments of their city. It was intended that plays in the national idiom of Bohemia, the Czech language, should be performed in it, in order to keep alive the sentiment of nationality and the love of country. It is to be rebuilt forthwith. It was insured for about half its cost, and subscriptions, from high and low, are flowing in to complete the amount required.

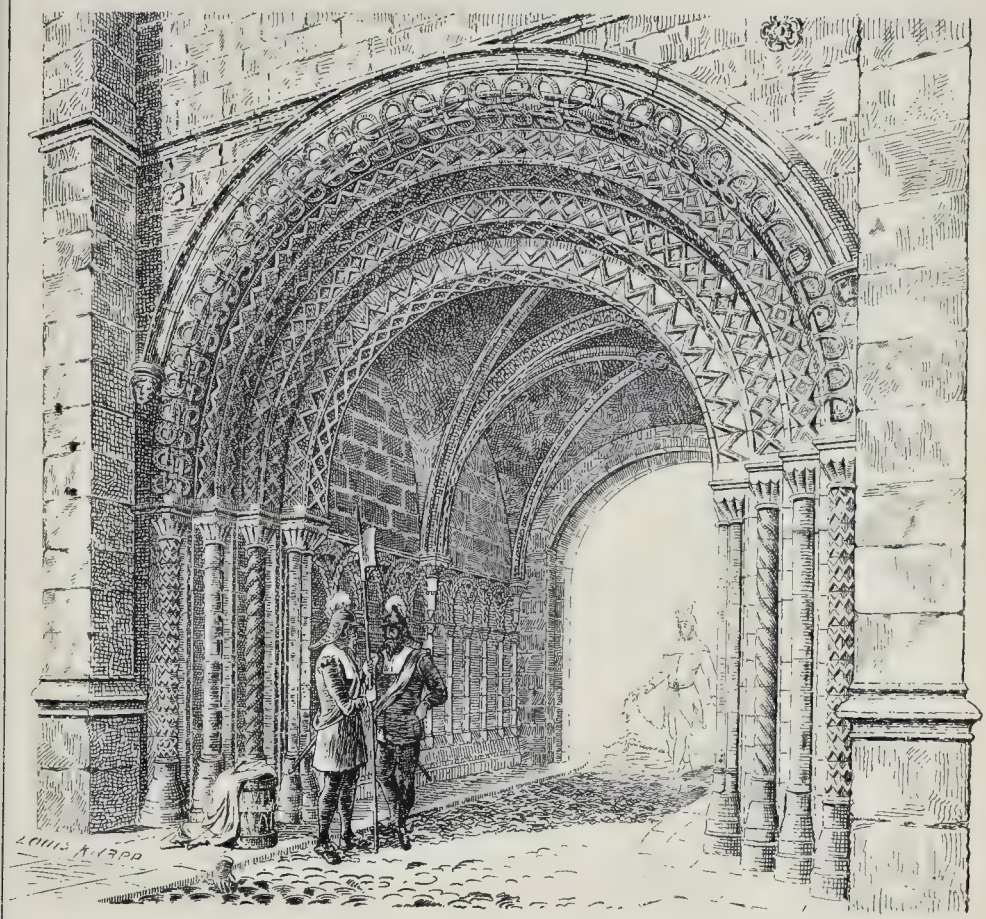


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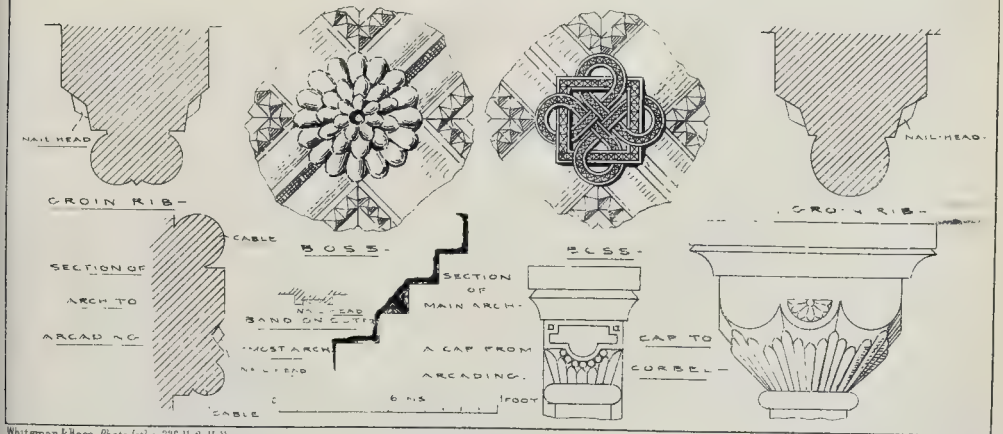
THE R.C. CHURCH OF OUR LADY AND ST. DENIS, AT ST. MARYCHURCH, TORQUAY.

MESSRS. JOSEPH A. HANSOM & SON, ARCHITECTS.



GATEWAY TO S^T AUGUSTINE'S ABBEY - BRISTOL.

WEST VIEW.



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ST. MARYCHURCH, TORQUAY.

VISITORS to Torquay will find pleasure in visiting the now completed R.C. Church of Our Lady and St. Denis, at St. Marychurch, of which the spire is now a prominent land-mark for miles around. In our present number we give an internal view, taken from the north porch looking across the nave and two aisles to the Lady Chapel, which does not occupy the usual place at the east end, but is placed for necessary reasons at the south side of the south aisle, at its western extremity, and measures 30 ft. by 12 ft. To the right of the picture is a large tribune for the orphans under the care of the nuns of the third order of St. Dominic, to whose convent the church is attached. The whole cost of the church, of which a part has been in use some years, has been defrayed by Mr. Chatto. It consists of a chancel, 30 ft. by 20 ft., with nuns' choir on the south side and sacristies and presbytery on the north; nave, 103 ft. 6 in. by 22 ft. 3 in.; north aisle, 88 ft. 6 in. by 12 ft. 6 in.; and south aisle, 103 ft. by 12 ft. 6 in.; the Lady Chapel already alluded to; and the tower and spire at the west end of the north aisle, the baptistery forming the lower part. The internal dimensions are 133 ft. by 47 ft. 3 in. The church is built in local limestone and Chudleigh limestone, with Box-ground and Westwood-ground dressings outside, and Corsham Down inside. The Bath stone was supplied by Messrs. Randell & Saunders. The spire is, however, all built in Portland stone, and terminates in a copper cross, which communicates with and forms part of the lightning conductor, which is a ribbon 4 in. broad by ⅛ in. thick. The top of the cross is 176 ft. above the floor level, which is nearly 300 ft. above the level of the sea. The entasis of the spire is peculiarly graceful, being a rise of 9 in. in 90 ft.

Mr. Eddles, of St. Marychurch, took the contract for the completion of the building at 10,146*l.*, but several additions have been subsequently made. Those concerned had to deplore his loss during the course of the works, and they have since his death been carried on by his sons and executors, Messrs. William & Jesse Eddles. Mr. Condy is the clerk of the works.

The altars and statuary are by Messrs. Farmer & Brindley, Mr. Earp, and Mr. Boulton, most of the foliage being very creditably done by Mr. Jackman, of St. Marychurch. The font was carried out by Mr. Blackler, of St. Marychurch, and is, together with its steps, of polished local limestone in different colours. The whole of the works are from the designs of Messrs. Joseph A. Hansom & Son, architects, of 27, Alfred-place West, South Kensington; and since the retirement of Mr. Hansom, sen., from the firm, the works have been carried on under the superintendence of Mr. Joseph Stanislaus Hansom, F.R.I.B.A. The copper cross on the spire was executed by Messrs. Hart, Son, Peard, & Co., from the designs of the architects.

The church is now in regular use, but no bells are as yet placed in the tower. It is proposed to have carillon chimes.

THE ABBEY GATEWAY, BRISTOL.

THIS remarkably beautiful example of Norman architecture originally formed the entrance to St. Augustine's Abbey, which is now known as Bristol Cathedral. It is in a wonderful state of preservation, the whole of the detail, save such as is within about 2 ft. 6 in. of the ground, being nearly as perfect as on the day when it was placed there. It would appear to have been erected during the reign of Henry II., as a superstructure of the Perpendicular period of architecture, and built at the expense of one Abbot Newland, or Nailheart, bears an inscription, couched in very ecclesiastical Latin, to the effect that King Henry II and Lord Robert Fitzhardinge were conjointly the founders of the monastery. Their statues and arms are to be seen upon Abbot Newland's building, and also those of Edward the Confessor and Richard de Clare, Earl of Pembroke, the latter two bearing title-deeds in their hands, and Lord Berkeley holding a model of the building. Pembroke's arms are also emblazoned at the high altar of the cathedral, together with those of Lord Berkeley and Henry II., and hence it may be inferred that some religious establishment endowed by Edward the Confessor and an Earl of Pembroke existed previously to the erection of Sir Robert Fitzhardinge's magnificent building.

It is impossible, in viewing this archway, to avoid being struck by the careful thought and painstaking consideration which has been bestowed upon each minutest detail by its twelfth-century architect, as well as by the broadly artistic effect which he has imparted to it as a whole; thus, every fillet maintains a uniform width throughout its length, every nailhead is perfectly cut, and some of the ornaments are undercut in a way that must have cost the workman much time as well as rare dexterity. The arrangement of the carved decoration of the four external members of the chief arch evidences much taste and artistic feeling; round the outer member, and in high light, runs a slightly relieved riband ornament, fantastically twined and knotted around two continuous roll mouldings. Within this, and, by contrast, in the deepest shadow of all, is a member studded with bold lozenge ornaments, so deeply undercut as to stand clearly out against the darkness behind. Within this, again, the decoration, though less vigorously rendered, is sufficiently defined to be easily followed by the eye; and the inmost member of all, which is practically only slightly shaded, is chased with a light chain of zigzags. In the caps of the interior arcade, the architect has freely indulged his fancy, scarcely two of them being alike in design.

The view given is made from carefully measured drawings made by myself some years ago, and might be described as a detail perspective view, the jointing of the stones, as well as the position of each ornament, being faithfully rendered.

LOUIS KNAPP.

MICA.

THIS industry is represented at the Breslau Exhibition in the full extent of its different branches, by the collection of Max Raphael. The fire-proof, glassy, and transparent mineral is found in America in large quantities, but not in sufficient abundance to supply the wants of that market, and hence there is a large export of the article from this side of the Atlantic in the leaf form. It is there mostly used for covering the openings in furnaces, so that the chemical changes which are being produced by the heat can be controlled. It is also used for purposes of a domestic nature.

Mica is found in Ural and Finland. The Swiss and Tyrolese Alps produce the most favoured descriptions, which are also worked up in Thuringia into the forms required for commerce. The raw material is in the shape of thick leaf-formed slabs, which can be divided to form almost any degree of thinness, and it is in different shapes and thicknesses that the article is packed for export to America, this being a main feature of the trade. Another use to which it is put is the decoration of pottery.

The immutability of this product, its resistance to heat and damp, the readiness with which it receives impressions of colours, photographs, &c., enable it to be put to a variety of uses.

Herr Raphael does not confine himself to supplying the material, but in many cases sends the article out in its manufactured state. It is used in telephones, and for ventilators it is preferred to metals, as they are liable to oxidation. It is also used for more complicated purposes in lamps, &c., in cases where glass has hitherto been employed.

There is, however, a limit to its applications, and one of our foreign contemporaries remarks that the church-windows, with paintings and shadings, which are exhibited, cannot be considered as producing the effect of painting on glass, although in themselves they are interesting trials.

There is another exhibitor of this article, Jaroslaw, who shows some handsome lamp-shades, which, besides being ornamental in themselves, have the advantage of not curling with heat, as is the case sometimes with shades composed of paper.

St. Paul's, Brixton.—The above church was consecrated on the 29th ult. It is situated in the Ferndale-road. It was built by Mr. Jones, of Gloucester, from the designs of Messrs. Habershon & Fawckner, of Bloomsbury-square. The lighting arrangements were carried out by Messrs. Jones & Willis, of London and Birmingham, and we are informed that the same firm supplied the other interior fittings.

THE BRITISH ARCHÆOLOGICAL ASSOCIATION IN THE WEST OF ENGLAND.

CONCLUDING our record * of the proceedings in connexion with the Malvern Congress of this Association, we have to note that on Saturday, the 27th of August, there was an excursion to the Herefordshire Beacon, Midsummer Hill, Bronsil Castle, and Eastnor Castle. Little Malvern was the first place visited, and here sketchers were charmed by the church-tower. Mr. Daniel Parsons read a paper, stating that it was certain that the church began to exist as far back as 1125. He had examined the original register of the Priory of Worcester. Little Malvern was given by the 27th Bishop of Worcester to the Benedictines, who were the great church-builders in Worcestershire. The Bishop retained jurisdiction over the place. In 1171 two brothers came over to Little Malvern and founded the church. No dedication of the church had taken place up to that date. In 1237 a Provincial Council held in London ordered that all churches built with walls perfect should be consecrated within two years. In the Malvern district the difficulty of getting materials must have been almost insuperable; and to that he attributed the delay in consecration. In 1182 the dedication took place. The Bishop preached in the Chapter-house, and his text was still preserved. In 1480 the discipline of the house had become relaxed. Nash stated that the monks had become people of bad character; but this was not the case. In 1534 the monks were compelled to give up their jurisdiction, and the property was afterwards given by deed to a member of the Russell family. Mr. Parsons described in detail the painted glass of the large window, showing sympathies with the House of York. It was mentioned that the preservation of one of the windows was due to the late Mr. Albert Way. Mr. Parsons also described the tiles, including one which is also found at Great Malvern, with the following inscription:—"Thenke mon thi liffe mai not eu endure: that thow dost thi self of that thow are sure: but that thow kepist un to thi sectur [executor's] cure: and eu hit [it] availe the hit is but aventure." The date of this tile is about 1450. After looking at the church, the excursionists, under Mr. Berington's guidance, visited Little Malvern Court and gardens. A large number went beneath the enormous lime-tree, under which, on one occasion, 183 persons were assembled. The branches trail all around on the ground. This is supposed to have been caused by weights placed on the tree. Mr. Berington stated that the tree was not much more than 150 years old.

From Little Malvern the party proceeded to the Wind's Point, where they left the carriages in order to inspect the two great camps of the Malvern Hills. Like some Dover or Namur of the olden days, the great hill fortress of the Herefordshire Beacon frowns upon the valley below. Its belt of ramparts having been passed, the archæologists at length reached the great central mound, from which, the day being clear, there was a magnificent view of the country for many miles around. Mr. J. Tom Burgess pointed out the various objects of interest in the distance. Mr. Edwin Lees, in a paper which he read on the hill, maintained that the camp was of two ages, and the work of two separate tribes. He attributed the greater part of the camp to an age prior to the Romans. He thought the camp was held by the Welsh, and pointed out that it was not until the days of Athelstan that the Welsh were driven from the Malverns across the Wye. To this latter period belonged the golden coronet which was found at Burstner's Cross. Mr Lees gave an account of the finding of the crown, and quoted Card, Nash, and other writers. He had fought many battles on the hill, and was prepared to hold his own against any theory of Caractacus having been there. Sir J. A. Picton pointed out that there were people in this country before the Celts, and that they naturally occupied the high points for defence. He thought the camp might have been occupied by various peoples at various times.

Mr. J. Tom Burgess maintained that the camp was one of the frontier fortresses of the Silures. On the opposite side of the valley was Bredon Hill. This, from the remains found upon it, was undoubtedly one of the outposts of the Romans in the time of Ostorius, and along the whole line

* See pp. 265, 311, *ante*.

of hills, which stretched from Bredon to the south, every point of vantage once bristled with Roman watchfires. In a direction due east there was another line of earthworks and fortresses, which were the frontier line of the Cornabii. Their remains could be traced along the eastern bank of the Severn; and looking to the north in the far distance was the Wrekin, which was the capital of that tribe. A little farther to the west could be seen a line of fortresses, which might be attributed to the Silures. Far away to the south was the Bristol Channel, which represented the southern end of their territory. The Herefordshire Beacon was about the centre of that line, and the camp was one of the largest fortresses in the country. During the nine years' war which Caractacus waged against the Romans, and, indeed, during the whole of the twenty-five years which elapsed from the landing of the Romans to the period of the subjugation of the people in whose ancient territory they now stood, there must have been conflicts going on in that neighbourhood.

From the Herefordshire Beacon, the archæologists walked across the hills, under Mr. Wilson's guidance, to the Midsummer Hill. Mr. Burgess pointed out that the hill probably took its name from the Midsummer or Beltane fires. It was afterwards suggested by Mr. Piper that the old name of the hill was Bronsil, a name surviving in the castle in the valley below. The ramparts of the camp and the hollows, where formerly there were habitations, were pointed out. At the Holly Bush Pass the excursionists took carriages and drove to Bronsil Castle. Of this fine old castle of the fifteenth century nothing now remains except one of the round towers. The old fragment of stone, the clear, broad waters of the moat, and the tangled vegetation, make up a pretty picture. The castle was a double-moated one. The outer moat, however, now only remains. Mr. G. H. Piper read a short paper on the history of the castle, mentioning that it was built by Richard, son of John, first Lord Beauchamp of Powyke. It was suggested by one of the party that probably the area was moated before the Conquest. Mr. Burgess did not think that moated areas were generally to be traced further back than the time of Stephen.

After a beautiful drive by the side of Eastnor Park, with its almost unrivalled herd of 800 deer, the Somers Arms was reached, where luncheon was partaken of, and the visitors afterwards wended their way to Eastnor Church, where the monuments to various members of the family of Earl Somers were scanned.

From the church it is not a long walk to Eastnor Castle. This was commenced in the earlier part of the century, and is built in the old baronial style. The former castle stood at the west end of the present lake.

At the evening meeting in Malvern, Mr. G. H. Piper read an account of the excavations which were made on the Herefordshire Beacon in September, 1879. In one hut, hollow pottery, and the bones of the horse, sheep, deer, and other animals, were found. These were exhibited on the table. At the same meeting, a paper by the Rev. W. S. Symonds on "The Battle of Tewkesbury" was read by Mr. Wright. As this meeting, strictly speaking, terminated the Congress, votes of thanks were given to the President, Lord Alwyne Compton, and to many other gentlemen, for services rendered in connexion with the week's proceedings.

Extra excursions and meetings took place on Monday, Tuesday, and Wednesday, the 29th, 30th, and 31st of August. On Monday a visit was paid to Worcester, where the members were received in the Guildhall by the Mayor (Alderman Townshend). Alderman Noake gave a short account of the Guildhall, mentioning that Thomas White, a pupil of Sir Christopher Wren, was its architect. He also described the pictures, including that of Sir John Pakington, the fourth baronet of Westwood, and that of George III. by Reynolds. The various charters of the city had been carefully laid out on the tables by Mr. S. Southall. Mr. W. de Gray Birch, F.S.A., said that this was one of the best collections of charters they had seen in their rambles for many years. The first charter was that of King Richard I., written in the beautiful handwriting of that period. In this charter the city of Worcester was called a ville. The burgesses were to pay 20*l.* yearly to the exchequer, and for that they were to do as they pleased within the city. The charter was witnessed by the Archbishop of Canterbury and other nobles, and was dated 1189. The second charter was most important as far as the liberties of the city were concerned. Worcester was here called a *civitas*, and the inhabitants were described as citizens. The charter was dated the 11th year of Henry III., and was witnessed by the Bishop of Bath and other dignitaries. This charter granted various immunities. It gave permission for a merchant guild with hanse; it provided that no one should bring merchandise into the town without permission; and it also granted scot and lot, stallage and tollage; 30*l.* per annum was to be paid to the exchequer. Appended to it was one of the finest specimens of the weaver's art to be found in England. He congratulated the Corporation of Worcester on the excellent way in which the charters of the city had been preserved. Mr. Birch then read a portion of a paper on "The Anglo-Saxon Charters of Worcester Cathedral." The cathedral church of Worcester was, he said, justly celebrated for its Anglo-Saxon literary treasures. Saxon charters were a grand record of our insular history; and to them we must look for nearly all our information respecting real property and many other matters. They were also of value as illustrating the minuter details of early English history. It was the work of the Teutonic races to infuse vigour and sanctity into institutions that were perishing through their own corruption. Roman law looked to the individual member of the State. Teutonic law based itself upon the family bond. It was highly probable that the Saxons had symbolic means of effecting the transfer of land. The Runic characters, in use up to the arrival of Augustine, then gave way to the Roman writing. In the time of Wulstan there were between 200 and 300 Saxon charters in the monastery of Worcester. Wulstan ordered the deeds to be transcribed. Of these nearly one-half were now unknown, except in the form of transcript. There were twenty original Anglo-Saxon charters of Worcester in the British Museum. With the exception of Christ Church, Canterbury, no other cathedral or monastery had contributed so many original Saxon documents to the Museum. Mr. Birch, having given some details as to the Worcester Anglo-Saxon charters, said that the total number of Anglo-Saxon charters preserved was very limited, perhaps not exceeding 2,000. These documents were beginning to show signs of decay, clearly foretelling that the time would come when a Saxon charter would be no longer in existence. What students really required was a *corpus* of these charters. This work, which Kemble almost accomplished, should now be undertaken by a society.

From the Guildhall the visitors walked to the Cathedral, where the Dean gave a short account of the history of the fabric, acknowledging his obligations to the description by Professor Willis. The church built by St. Oswald in the tenth century had entirely disappeared. At the time of the Conquest Wulstan was Bishop of Worcester. An attempt was made to dispossess him, but in the end he was retained. Wulstan determined to rebuild the cathedral church, and began the work in 1084. In 1092 he held a synod in the crypt, which, said he, "I have built from the foundations." The crypt was, therefore, a dated example of Early Norman architecture. In 1203 Wulstan was canonised. In 1216 King John died; and before his death he said he commended himself to God and St Wulstan, the last great English saint. In 1218 the cathedral was solemnly dedicated. That was the Norman cathedral, and probably the building had been going on from the days of Wulstan. The Norman work remaining was interesting as giving the key to the construction of the building. The Norman cathedral was exactly of the same size westwards as the present cathedral, with the pillars in the same places. The apse of the Norman choir was near where the tomb of King John now stood. In 1224 the foundation of the new choir was laid. Between 1317 and 1321 the north aisle of the nave was built by Bishop Cobham. As a whole, the cathedral was completed by the year 1400. The Dean then conducted the party over the cathedral, pointing out the remains of the old Norman building in a blocked-up arch over the marble string-course of the choir, and in the arches of the south choir aisle. Mr. Loftus Brock was of opinion that the latter were part of Wulstan's building, especially from the wide joints; but he thought that the carving was of later date. It was suggested by a member of the Architectural Association, when visiting the cathedral a week or two ago, that the passage to the north of the Chapter-house was a fragment of the Church of St. Oswald, and, therefore, was tenth-century work. Mr. Loftus Brock pronounced against this theory. Mr. Lynam thought the work the earliest in the cathedral, and ante-Norman. In the Chapter-house the Dean mentioned that the round Norman arches were still behind two of the Perpendicular windows. The Dean, in replying to a vote of thanks, mentioned that the total cost of the restoration of the cathedral was 130,000*l.*

On Tuesday the last Worcestershire excursion took place. Leaving Worcester in carriages, the archæologists drove through Whittington to Cruckbarrow Hill. Clambering up the hill-side they soon reached the top, from which, when the weather is fine, there is a beautiful view. Mr. J. Tom Burgess said that Cruckbarrow was one of about twenty hills he knew with this name. This was a marl-stone hill, which appeared to have been escarped as a beacon between the Malvern Hills and a series of earthworks extending along the valley of the Severn. After a long drive past Spetchley and Broughton Hackett, the carriages drew up in front of Huddington Court and church. The church was first inspected. Mr. Loftus Brock said that it was not often that they saw a church in so unaltered a state. Archæologists though they were, they must be grateful to think that, probably through the work of their own society, and other kindred societies, the taste and regard for old churches had been so much developed that there were now few opportunities of seeing churches in such a poor condition as Huddington. The church, however, was interesting as an example of the little village church of the early part of the fourteenth century, in which fewer alterations of a later date had been made than was commonly the case in such buildings. The building was not unworthy of study. It contained the original timber roof, which, if the plaster were taken off, would be seen to great advantage. It was surprising what a different effect would be produced by the outlay of a few hundred pounds. He hoped their visit would result in drawing attention to the church and preserving it. It was apparent that, unless something were done, a catastrophe would occur to its bulging walls and rotten timbers. The church contained a chancel-screen of Jacobean date. The tiles of the floor were of very great beauty, but there were now only about a dozen in anything like a state of preservation. It was seldom they saw a porch of so early a date in such a good state of preservation. He considered it to be as old as the church. The hall was, as in many other cases, near the church. The lord of the manor in the old times was the patron and father of the village, looking after his own comforts in the hall and the spiritual welfare of the people. The ladder was of the same date as the porch.

Mere Hall was next visited. It is one of the finest specimens of the timbered houses for which Worcestershire is famous. Different opinions were expressed as to the date of the building. The house bears the date 1337. Mr. Loftus Brock and Mr. Reynolds thought that the building was erected in the time of Charles I. Other gentlemen thought that it was Elizabethan. Mr. Brock said that it was a matter of considerable gratification to him to stand beneath the roof of that house, not only because it was a specimen of the black and white house so common in the district, but for personal reasons which it was pleasant for him to remember. On the disforesting of that district, it appeared that oak was so abundant that farm-houses and even cottages were erected with it. On the building was the date 1337. His own impression was that the date was placed there for a sort of double purpose. The date of 1637 so nearly fitted in with the style of the house as to justify them in believing that the house was erected at that time. The house was figured in Habershon's "Half-Timbered Houses." He had referred to his personal feeling in being in that house. Under the direction of his late partner's father, Mr. Habershon, the house received certain alterations and additions to adapt it for the purposes of a modern residence. Probably it was to Mr. Habershon that they owed the existence of the house at all. It had been stated that Mr. Habershon covered the new work of the house with black and white stripes, in imitation of the old work. They might depend upon it that the work was originally erected without those stripes, as Mr. Habershon would be the last man to create an architectural sham. It

was a matter of gratification to see that Mr. Bearcroft, the owner, had done so much to uphold and preserve to future generations so interesting a specimen of a style of architecture which was every day disappearing. Apart from the cordial reception Mr. Bearcroft had given them, they owed him a debt of gratitude for the care he had bestowed on the house.

From Mere Hall the party drove to Droitwich, where luncheon was provided at the Raven Hotel,—a building of some archæological interest. At St. Andrew's Church the Rector was in attendance to receive the visitors. The whitewash in this church, though it mars, does not conceal the original beauty of the mouldings and carvings. Mr. J. Tom Burgess said that Droitwich was believed to be the Salinæ of the Itinerary of Richard of Cirencester. There were indications that in ancient times it was a city of considerable importance, arising from its salt springs. A tesselated Roman pavement found at Droitwich was preserved in Worcester Museum.

From Droitwich the archæologists drove to Salwarpe, where Canon Douglas and Mr. J. T. Mence received the party. The nave of the church is late twelfth-century work. One of the most striking points of the excursions has been the immense quantity of work of the Transition period between Norman and Early English that has been seen. The latter half of the twelfth century was evidently a great church-building period in Worcestershire. To the Norman nave of Salwarpe beautiful Decorated aisles have been added. In the chancel, which was rebuilt in 1848, there is a well-preserved recumbent effigy of the beginning of the fifteenth century. The parish chest encloses some curiosities, which were shown by Mr. Douglas. From the church it is only a few yards' walk to the Court House. The present house was probably erected about the time of Henry VII. About that time, or later, the house was granted to the Talbots. Salwarpe Court, like many other fine houses in the district, has its herring-bone brickwork painted white. It is the opinion of some architects that the effect of these old houses would be heightened by leaving the brickwork untouched.

On Wednesday the members of the Association and their friends made the last excursion. They proceeded by an early train to Cheltenham, where the doors of Thirlestaine House were thrown open by the courtesy of the Rev. J. E. A. Fenwick, M.A., and the trustees of the late Sir Thomas Phillipps, bart., and the party were permitted to inspect the valuable library and interesting pictures which used to be so fondly treasured at Middlehill. Some of the choicest MSS. of this vast collection were exhibited in one of the rooms. Mr. E. Maunde Thompson, F.S.A., the keeper of the MSS. in the British Museum, explained, in a brief address, the value and importance of these and other rare works in the library, which were unequalled outside the national collection.

After lunch, which was partaken of at the Plough Hotel, Mr. T. Morgan, F.S.A., hon. treasurer, who presided, moved a vote of thanks to Mr. J. Tom Burgess, F.S.A., for his valuable services during the excursions. We may add that for a portion of our notes of the proceedings of the Congress we are indebted to the columns of the very old-established newspaper known as *Berrow's Worcester Journal*, which, dating back to 1690, is the oldest existing provincial newspaper in the kingdom. Mr. J. Tom Burgess is its editor.

DRAWING IN AMERICA.

WE have received from America the "Annual Report on Industrial Art Education in the State of Massachusetts for the year 1880," and "Plan and Graded Programme on Instruction in Drawing for the Public Schools" in the same State, both by Mr. Walter Smith, State Director of Art Education in Massachusetts. They are valuable and interesting documents, and show the thoroughness with which Mr. Walter Smith is pursuing his work.

The following propositions define the position taken on this question of industrial drawing in the public schools:—

"1. All children who can be taught to read, write, and cipher, can be taught to draw.

2. Drawing, by the law of Massachusetts, is required to be taught to every child as an element of general education, like reading, writing, and arithmetic.

3. As an elementary subject, it should be taught by the regular teachers, and not by special instructors.

4. The true function of drawing in general education is to develop accuracy of perception and to exercise the imagination, thereby tending to produce a love of order and to nourish originality.

5. Educationally, drawing should be regarded as a means for the study of other subjects, such as geography, history, mechanics, design. In general education it is to be considered as an implement, not as an ornament.

6. The practice of drawing is necessary to the possession of taste and skill in industry, and is therefore the common element of education for creating an enjoyment of the beautiful, and for a profitable, practical life.

7. In the primary, grammar, and high schools, drawing is elementary and general; in the normal and evening schools, advanced and special,—for teaching purposes in the first, and for skilled industry in the second.

8. Good industrial art includes the scientific as well as the artistic element; science securing the necessity of true and permanent workmanship, art contributing the quality of attractiveness and beauty. The study of practical art by drawing should therefore comprehend the exactness of science by the use of instruments, as in geometrical drawing and designing, and the acquisition of knowledge of the beautiful, and manual skill in expression, by freehand drawing of historical masterpieces of art and choice natural forms.

9. Drawing may now, therefore, take its legal place in the public schools as an element of, and not as a specialty in, education, at as little cost as any other equally useful branch of instruction, with the prospect that at a future time as many persons will be able to draw well as can read and write well, and as large a proportion be able to design well as to produce a good English composition."

Mr. Walter Smith, who is an Art Master of South Kensington, was an esteemed correspondent of our own before he went to America, and will be remembered by many of our readers. We send to him across the broad Atlantic our heartiest good wishes.

THE FIRE IN CHEAPSIDE.

THE recent fire in Cheapside and Bread-street leaves after its ravages, and for the short time it must remain before the whole corner is demolished, the ruin of a well-constructed modern stone building, a picturesque and novel sight, such as is scarcely to be found nearer to London than the remains of the Tuileries or the Palais du Quai d'Orsay, destroyed by the Communists in 1871. Bread-street, indeed, had a narrow escape, and with it, a neighbourhood fraught with interesting associations; for, as all Londoners know, it was in this street, within a short distance of the fire, that Milton first saw the light (1608), and he was baptised in the Church of Allhallows in the same street. It was from his father's house in Bread-street that Milton made his first removal in that series of changes of residence in London, all of which are well known,—better known, perhaps, than those of any other great Englishman who has migrated from spot to spot. Milton's house in Bread-street,—before the Great Fire of 1666, in which the whole neighbourhood was destroyed,—was, we have contemporary authority, constantly visited by strangers and foreigners.

The antiquarian associations of this street are great, and such associations always possess an interest even in the midst of the excitement of modern existence. In Bread-street it was that stood, in the days of Queen Elizabeth, the Mermaid Tavern, of poetic memory,—the tavern where met Shakspeare and Ben Jonson, Raleigh and Marlowe, and that set of literary contemporaries who adorned so brilliantly our English Renaissance, whose poetry, while it breathes with all the grace and polish of Classic tradition, rings with the healthy British joviality that endeared the hours spent in Bread-street in the memories of the merry band who filled the quaint bar and back room of the oft-sung Mermaid, in the poetry of whose frequenters the literary student welcomes that first expression, as a polished authority has well put it,* of the growing consciousness on the part of English-men of the commercial and constitutional future of this our great country.

It is a further association that may almost be said to belong to Bread-street, that nearly opposite it, in Milk-street, Cheapside, was born the courtly, learned, witty, and unfortunate Sir Thomas More, buried under the quiet shadow of his parish church at Chelsea.

From such recollections of the past the stirring incidents of the present moment are eminently calculated to distract the most concentrated attention. The recent fire in Cheapside, will, we hope, at least afford the benefit of one lesson by which all may profit. The *employés* in Messrs. Copestake's extensive premises, owing to the excellent practice into which they had been drilled by previous rehearsal of the manner in which they were to act in cases of emergency, were able not alone to protect their own property, but to render able assistance to the firemen in their dangerous task. This example is one which should be more largely made known and introduced than is at present the case. In these days of an almost excessive love of athletic exercise, we can imagine no better direction in which an expenditure of young force can be turned than towards such an aim. Our volunteer movement has shown, within only a few weeks, its vigorous vitality. In America every citizen, unless we are much mistaken, is called upon to be either a militiaman or a fireman.

And as we are speaking of America, while, in such an instance as the recent destructive fire in Cheapside, not an imputation can be thrown on the skill of our firemen, it has long been admitted that, across the water, the fire-brigade with its apparatus is more fully organised than here, and that in the case of a building well alight in England little is usually done beyond limiting the spread of the disaster. Should such a state of affairs be allowed to continue? Should not, as one precaution at least, the increased use of the fixed hydrants common in America, running from top to bottom of the huge warehouses, and in which the water-power is ready at any instant on the highest floors, be insisted upon in all new buildings? Must another winter, with its inevitable tale of disasters, pass away without some progress being registered, even in our already well organised and nobly-served Metropolitan Fire Brigade?

As will be inferred from what we have said above, the huge premises of Messrs. Copestake had a narrow escape. Had they got fully alight Bow Church would have been in great jeopardy. The main frontage of Messrs. Copestake's premises is towards Bow-churchyard,—not a wide thoroughfare, what width there is being usually more than half taken up with boxes, bales, straw, and other combustible matter. In fact, it seems to be made a sort of packing-yard. On the south of the church the "churchyard" is continued in the form of a narrow passage running into Bow-lane. In this passage are some large premises occupied, apparently, by a firm of wine merchants or druggists, and it will hardly be credited that this firm seem to be in the habit of stowing a large number of hampers, crates, and boxes, quantities of straw (loose and in trusses), and other highly inflammable matter, to the height of 5 ft. or 6 ft., close against the south wall of the church, under its windows, and even in immediate contact with the very wood of the south door. A fusee or lucifer carelessly thrown down amongst this heap might easily convert it into a large bonfire, and, given a favourable wind and a dearth of water, the Church of St. Mary-le-Bow would soon be "burnt out." The City Church and Churchyard Protection Society might take this matter under its cognisance.

* Mr. A. J. Beresford-Hope, M.P., in his inaugural address at the Archæological Congress held in London, 1866.

SIR,—Passing along Cheapside shortly after the outbreak of this fire, I was much struck with the inability of the fire brigade to prevent the ignition of houses on the opposite side of Bread-street. It occurred to me that if blankets, or other thick woollen material, could be hung out of the upper windows to overlap those below, the engines could easily keep these saturated, and thus prevent the possibility of firing the woodwork thus covered. The roofs should be similarly protected, and evaporation alone would keep the temperature down. Such a simple process would have saved the premises of Messrs Cow Hill, & Co., and all those on that side of Bread-street. It would not merely save them from destruction by fire, but the ruin of the stock by water.

If the demand arose, some coarse felt would be manufactured for the purpose, and suitable lengths form part of the equipment of each engine or hose cart.

That the usual means of arresting the spread of fire should be by reducing neighbouring properties to a mass of wet rubbish speaks volumes for the scientific enlightenment of the age we live in. I forbear to speak of fireproof flooring

THOS. C. SORBY.

THE SEWERAGE OF EASTBOURNE.

IN connexion with the recent Sanitary Exhibition at Eastbourne, a visit was paid by a deputation of the Association of Municipal and Sanitary Engineers and Surveyors to the Sea-Wall works, where a discussion was held, after which they proceeded to the Ejector Works at Seaside, where, after reviewing the works, the following paper was read by Mr. C. Tomes, the Town Surveyor, a discussion following:—

Before describing to you the action of the ejector system as applied at Eastbourne, I propose to briefly state the reason for its adoption. The main sewer of the town is for a distance of about 1,400 yards from the outfall towards the town below high-water level, and in consequence of this, like many other coast towns, it is for some hours during the day tide locked. This causes the sewage to back up and be stagnant in the lower part of the town, there not being sufficient time between high and low water for the whole of it to pass away. It was therefore resolved, upon my report to the Board, to adopt Mr. Isaac Shone's ejector system, which, by the use of compressed air, will maintain a constant flow through the outfall sewer both at high and low water. The arrangement by which this is effected I will now proceed to describe. The air for supplying the ejector is compressed by two 14-in. "compressors" invented by Mr. Thomas Sturgeon. These are worked by a pair of high-pressure expansive and condensing engines (the cylinders of which are 10½ in. in diameter), fitted with the Hon. Charles Parson's patent variable expansion gear and equilibrium piston slide valves, the engines being arranged so that they can be run either separately or together. The steam is supplied from two "Kesterton" boilers, provided by Messrs. Tangye Brothers, of Birmingham. The compressed air is passed to the three ejectors for a distance of about 350 yards through 6-in. cast-iron flange pipes, and at the same time air is being stored in the receivers for use during the night if required, thereby effecting a great saving in night labour, and at the same time keeping the ejectors constantly supplied. A reducing valve is placed at the compressing station to regulate the pressure of air required by the ejectors. A connexion between the air receivers and the governor is also made, which, when the pressure in the receivers rises to a certain height, cuts the steam off from the cylinders of the engines and stops them, opening again and allowing the engines to run when the pressure lowers. Air from this station can be carried to any number of ejectors placed at different parts of the town, and at any distance from the compressing station. To pass on to the actual disposal of the sewage. The main sewer, by means of a penstock, is diverted from the direct outfall to the sea, and conducted to the ejectors, which then proceed to work. These consist of hollow cylindrical vessels, 4 ft. 6 in. in diameter by 5 ft. high, which are placed entirely below the level of the sewer, so that the sewage passes by gravitation into them through an 18-in. inlet-pipe, placed on the town side of the penstock. Inside the ejectors are two small cylinders, each being open at one end. The upper one, which is termed the "bell," is suspended with its open end downwards, and the lower one, termed the "cup," with its open end upwards, so that the latter is always filled with sewage. The "cup" and "bell" are connected by a rod, and a small rod passes from the upper one, the "bell," through a stuffing-box in the cover to a lever which acts upon a small slide valve governing the action of the automatic piston valve, so as to alternately admit compressed air to the ejectors and let it escape. When the ejectors are nearly full, the sewage, as it rises, encounters the "bell," closes up its open end, and compressing the air within it, lifts it up, thereby drawing back a small slide valve, admitting air pressure to one, and exhausting at the other end of the automatic piston valve, the outer ends of which act as the motion piston, the middle portion acting as the valve regulating the inlet and exit of compressed air. The piston-valve being thus moved over, opens the port admitting compressed air to the ejector, which forces the sewage out through a delivery-pipe into the sewer, on the sea or outfall side of the penstock, ball valves being placed both on the inlet and outlet pipes to prevent the back flow of sewage. The "cup" and "bell" arrangement being balanced, and the weight of sewage in the cup being neutral so long as it is submerged, retains its position until the ejector is nearly empty, and the sewage begins to pass below the cup. The dead weight of sewage in the cup then acting downwards pulls the cup and bell down, reversing the small slide valve, and so, shooting the piston-valve over to the opposite side, shuts off the compressed air and opens the ejectors to the exhaust. The compressed air at once rushes out, allowing a fresh charge of sewage to enter the ejectors, and the action is repeated. Valves are placed both on the inlet and outlet pipes of the ejectors, so that they may be readily disconnected and worked separately. In conclusion, it will be seen by this that the action of the ejectors is entirely automatic and depending upon the rate of flow of sewage. In full work each ejector will fill and discharge in one minute; but during the hours of minimum dry-weather flow the ejectors will be much longer in filling, thus doing only as much work as is actually required. The population of Eastbourne is 24,000, and putting the quantity of sewage to be disposed of at 40 gallons per head, the amount of sewage to pass through the outfall sewer will be 960,000 gallons per day. As I have before mentioned, the ejectors are capable of filling and discharging once in each minute, and their combined capacity being 1,500 gallons if the engines run 10 hours per day, they will dispose of 900,000 gallons in the 10 hours, air being stored at the same time in the receivers at six effective atmospheres. The receivers will contain at this pressure 50 charges, each of which will eject 1,500 gallons, making a total of 75,000 gallons which can be disposed of automatically during the night; the average thus disposed of by the ejector during the day and night amounting to 975,000, or 15,000 gallons in excess of the present requirements.

THE WANDSWORTH NEW PUBLIC HALL.

THE new Vestry and Public Hall, which has for some time past been in course of erection in High-street, Wandsworth, is now fast approaching completion, and it is expected that it will be ready for opening in about a month. The building has an elevation to High-street of about 60 ft. in width, and upwards of 50 ft. in height, with a tower at the west end 80 ft. in height to the top of an ornamental cresting. The main face of the elevation is in red brick, with Dumfries stone dressings and ornamentation, in which some elaborate carving is introduced. This more especially applies to the three lofty windows overlooking High-street, from which the public hall, the principal room in the building, is partially lighted. Between and on each side of these windows there are fluted pilasters, having carved capitals. The central window is surmounted by an ornamental pediment, whilst the two windows on each side of it have segment-arched heads. The elevation is surmounted by a gable in Dumfries stone, with vases on either side; behind rises a high-pitched roof. The lower part of the elevation is arched, forming an arcade and covered carriage-way leading to the entrance-hall of the building.

The building internally contains a large number of apartments, adapted for the various purposes to which they are intended to be appropriated. The principal approach to the building leads into an entrance-hall 18 ft. square, on the right hand side of which is the vestry-clerk's private office, an apartment 17 ft. by 19 ft., together with several clerks' offices and committee-rooms adjoining; and in the rear of the building, on the ground-floor, is the board-room for the general meetings of the vestry. This apartment is 31 ft. in length and 19 ft in width, and is at present receiving its fittings. The floors of the entrance-hall and those of the several corridors on the ground-floor are all laid with Minton's encaustic tiles. In the basement of the building is the heating chamber, from which the whole of the building is heated and ventilated, the heating apparatus having been supplied by the Thames Iron Company. Strong-rooms have also been constructed in the basement, from which there is a lift to the public hall and to the upper portions of the building. The public hall on the first floor is approached by a stone staircase 5 ft. in width, having ornamental cast-iron balusters. This apartment, which is the principal room in the building, is 73 ft. in length and 38 ft. in width, exclusive of the stage or platform, which is 12 ft. in depth and 20 ft. in width, the extreme length of the hall being 85 ft., running the entire depth of the building from the High-street frontage to the rear. The hall is lighted by a range of six windows on the east side, in addition to the three windows in the High-street elevation already referred to. It is 25 ft. in height from the floor to the ceiling. The floor of the hall is fireproof, constructed on Fox & Barrett's principle. The hall is being decorated. It has a coved ceiling divided into panels, which are being painted in varied delicate tints, with gold enrichments. A frieze of festoons is carried round the room immediately under the coved ceiling, and the walls are divided into large panels by double pilasters with ornamental gilt capitals. In connexion with the hall, on the west side, there are several ladies' and gentlemen's retiring-rooms and committee-rooms. It is computed that the room, which is intended for public meetings, lectures, concerts, and other entertainments, will have accommodation for about 1,000 persons.

The architect of the building is Mr. G. Patrick, of Drummond-chambers, John-street, Adelphi; and the contractor, Mr. Parsons, of Wandsworth. The cost of the building will be about 9,000*l.*

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,606. C. D. Abel, Southampton-buildings. Metallic structures suitable for barracks, workshops, and other buildings. (Com. by La Société Nouvelle de Construction, Paris.) Aug. 19, 1881.

3,620. J. Craig, Kilmarnock. Dressing enamelled bricks, tiles, or slabs. Aug. 19, 1881.

3,629. C. Drake, Battersea. Baths. Aug. 20, 1881.

3,630. C. Drake, Battersea. Facing bricks. Aug. 20, 1881.

3,633. S. Mead and J. W. Tiptaft, Birmingham. Adjusting action for toilet-glasses, swing-sashes, doors, &c. Aug. 20, 1881.

3,648. W. H. Stephenson, Blackburn. Heating apparatus. Aug. 22, 1881.

3,689. W. H. Windsor, Brentwood. Bolt for fastening doors. Aug. 24, 1881.

3,693. H. C. V. de Ahrbecker, and H. E. J. Hamkens, Lambeth. Fluid meters and ball-cocks. Aug. 24, 1881.

3,707. W. R. Lake, Southampton-buildings. Water-closet apparatus. (Com. by the Hartford Sanitary Plumbing Company, Hartford, U.S.A.) (Comp. spec.) Aug. 25, 1881.

3,708. A. C. MacLeod, Shrewsbury. Floors or surfaces for skating upon. Aug. 25, 1881.

3,713. C. D. Douglas, Glasgow. Baths. Aug. 25, 1881.

NOTICES TO PROCEED

have been given by the following applicants on the dates named.

August 23, 1881.

1,367. T. Wrigley, Chancery-lane. Construction of ceilings. (Com. by S. Müeller, Nürnberg.) March 28, 1881.

1,690. W. G. Sloane & J. Sloane, Dublin. Apparatus for heating and ventilating drying-rooms, &c. April 19, 1881.

1,812. A. E. Carey, Newhaven, and E. Latham, Birkenhead. Manufacture of concrete, &c. April 27, 1881.

1,854. J. M. Day, W. R. Green, & H. C. Walker, Great Dover-street. Construction of lifts and hoists, &c. April 29, 1881.

2,653. W. Barton, Boston. Stoves. June 17, 1881.

3,020. W. Howitt, Ilford. Sash-bar for the roofs, &c., of horticultural buildings, &c. July 9, 1881.

August 26, 1881.

1,817. Mr. W. E. Gedge, Strand. Artificial stone. (Com. by G. Boden, Atlantic City, U.S.A.)

2,276. J. McI. Shaw, Glasgow. Kitchen-ranges. May 24, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending August 27, 1881.

162. T. Rowan, Ryde. Ventilating buildings.

An air inlet box is provided, having two divisions, one filled with coke, the other with dry charcoal, limestone, &c. The air is made to pass through these, whereby it is purified. From this box a shaft leads the air into the building or room. Just above the end of this air inlet pipe is the mouth of the air ejecting pipe. This pipe is led to above the roof, where it terminates in a cowl, which

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

produces an induced current of air up this pipe. Jan. 13, 1881. Price 6d.

243. J. Shanks, Bristol. Discharge apparatus for water-closet and similar cisterns.

The cistern is fitted with a syphon discharge-pipe, the short leg of which has a conical mouth. Beneath this is placed a cup, which fits it, which cup is connected to the closed handle. The water in the cistern is a little below the bend of the syphon, but when the cup is raised, the syphon is brought into action. (*Pro. Pro.*) Jan. 21, 1881. Price 2d.

244. J. McAlister, Barrhead. Apparatus for heating water.

A number of tubes are employed which are of a long narrow section, the broad sides being placed vertically, and the water travels backwards and forwards through these in succession, being all the time exposed to the heat. (*Pro. Pro.*) Jan. 20, 1881. Price 2d.

248. E. de Pass, Fleet-street. Apparatus for heating by hot water and steam.

The steam, being raised in the boiler, is led to the room to be heated, and then taken through a surface heater filled with water. This is heated by the partial condensation of the steam, and the condensed water flows back to the boiler through a special system of pipes. The surface heater communicates with the hot-water stove by which the room is warmed, which thus absorbs the heat of the steam, and imparts it to the room. (Com. by E. Körtling, Hanover.) Jan. 20, 1881. Price 6d.

251. G. Whitehead, Heywood. Archimedian ventilators.

This relates to those ventilators which have revolving tops and screws or fans, and has outlet passages between the screw, and the revolving top, to prevent any down-draught. (*Pro. Pro.*) Jan. 20, 1881. Price 2d.

254. L. W. Sutcliffe, Birmingham. Self-feeding and smoke-consuming fires, &c.

As relates to fireplaces, a hopper is constructed at the back of the grate with a sloping bottom, and divided from the fire by upright bars. It has also a divided sliding top. Slack or fine fuel is placed in this, and the top is closed. When the fire is lighted, it communicates its heat to the slack, the gases of which pass through into the front fire, and are thus consumed. Jan. 20, 1881. Price 8d.

261. W. Jones, West Derby. Chimney-pots and exit ventilators.

An outer shaft is fitted round the chimney shaft above the roof, above which it rises about 2 ft., and a double cone is fixed in the centre of the top of the outer shaft, with one apex placed at the mouth of the inner shaft. (*Pro. Pro.*) Jan. 21, 1881. Price 2d.

270. C. D. Abel, Southampton-buildings. Portable heating apparatus.

This is applicable to heating apparatus of the kind described in the specification of Patent No. 382 of 1880. A water vessel is made of the required shape and size. This has a tube through it, in which the fuel is burnt. This fire-tube may be surrounded by an annular air space if required. (Com. by A. Morel, Epinal, France.) Jan. 21, 1881. Price 6d.

287. J. W. Midgley & B. E. Midgley, Keighley. Stoves, &c.

To economise coal the back of the stove is made adjustable and pivoted at the bottom close to the ribs. It can thus be regulated as desired. (*Pro. Pro.*) Jan 22, 1881. Price 2d.

297. M. Lenzberg & M. M. Lenzberg, South-place, Finsbury. Stair-rod eyes.

That part of the eye which is fixed to the stair is made of the usual shape, but the eye proper is made separate and screws into a hole in the fixed part so that in can be be adjusted to any thickness of carpet. Jan. 22, 1881. Price 6d.

305. A. C. Henderson, Southampton-buildings. Gas-stoves.

Under the stove is an undulated or smooth cone in form of a parabola, permitting the reflection of the light and heat of the burning gas. (Com. by MM. André & Legrand, Lyon.) Jan. 24, 1881. Price 6d.

307. J. Rule, Dublin. Apparatus for preventing the freezing of water in water-pipes.

An air-valve is fitted above the supply-pipe of the ball-cock, so that when the ball-cock is in action the valve is closed by the pressure of the water. A tap is fitted to the pipe at as low a level as possible below the cistern, and when this is opened, air is admitted through the air-valve, and the pipe is emptied. Jan. 24, 1881. Price 6d.

311. H. E. Newton, Chancery-lane. Ornamenting various surfaces.

To ornament surfaces of plaster, wood, &c., in imitation of marble, the surface is first washed with an adhesive material. A thick paste is then prepared of carbonate of lime and flour, &c., which is placed on the surface to represent the veinings. When this is dry the colour is added. (Com. by E. A. Batonnier, Vitry le François, France.) Jan. 24, 1881. Price 4d.

315. R. C. Robinson, Preston. Manufacture of roofing-tiles.

The head portion of the tile, and the rib, or projection, are formed before the body of the tile in a die, which has opposite its mouth a hollow stop for the rib. The body is then formed in the usual way. (*Pro. Pro.*) Jan. 24, 1881. Price 2d.

2,303. A. M. Clark, Chancery-lane. Fluid meters.

These have a hinged valve on the induction pipe, which throws the fluid on to the blades of an impact wheel. These blades are less in height than the vertical diameter of the pipe, so that the excess liquid can pass over them. The shaft of the impact wheel passes through the top of the meter, and actuates the counting mechanism. (Com. by B. Holly Lockport, U.S.A.) May 25, 1881. Price 6d.

THE LATE MR. CHAS. GRAY, ARCHITECT.

WE have to announce with regret the decease, on the 1st inst., of Mr. Charles Gray, who was best known many years ago as one of the founders, and, if we mistake not, the first honorary secretary, of the Architectural Association of London. The origin of the society is, in fact, to be found in the form of a letter addressed to this journal by Mr. Gray in 1846, advocating the establishment of some better means of education for young architects, and we are always glad to remember that we supported the enterprise so heartily as we did. Since that time the Architectural Association has done a great work, in connexion with which the deceased gentleman well deserves to be remembered with honour. As an architect in practice, Mr. Gray, in early life, attracted some notice by the erection of several buildings divided into suites of residential or business chambers. They were built almost always on corner sites, and commanded attention by their bold and simple style of treatment in brickwork. They are to be seen chiefly in the neighbourhood of Covent-garden and the Strand;* although others of his works, at South Kensington, of more ornate character, Highgate, and elsewhere, do him equal credit. In the competition for the Memorial Church at Constantinople, a design sent in by him was awarded honourable mention, and he took part in other competitions with a due share of praise, if not of profit. Unfortunately, however, he was led into building speculations, and although he did well at the outset, in the end, as he said, "the lawyers had all his money." Mr. Gray's age, at his death, was fifty-three; and we are sorry to hear he has to be numbered amongst those who have left a family unprovided for.

BOROUGH OF PORTSMOUTH SEWAGE DISPOSAL.

THE Corporation of Portsmouth have issued advertisements offering a premium of 500 guineas for the best scheme to dispose of their sewage, and it is one of the most remarkable productions in the shape of an invitation to intended competitors that we have seen. By its terms, and the wording of the memorandum accompanying the plans, we can hardly believe the Corporation to be in earnest. They tell intending competitors that a plan of the borough, showing the sewers and a memorandum thereon, will be forwarded for the sum of two guineas. What this deviation from the custom means we cannot say, but it is as absurdly ludicrous as it would be if the Corporation advertised for a town clerk or for borough surveyor, and asked intended candidates for a fee for the list of duties.

Are we to understand by this that the corporation of Portsmouth are so extremely poor as to be unable to afford giving the plans and instructions gratuitously? If so, how will they possibly be able to pay the premium? If, on the other hand, they have been led into this stupid blunder from a parsimonious economy, it would be well for intending competitors to ask themselves the question if such parsimony will not prevent their parting with the 500 guineas under any circumstances. As to their memorandum, it is conspicuous for its absence of all that information necessary to the engineer to shape a scheme. ENGINEERS.

THE CARRIAGE WORKS AT NEASDEN.

THE raising of the last principal of the roofs of the Metropolitan New Carriage Works, Neasden, was celebrated by a dinner the other day at the White Hart Hotel, Willesden, the chair being taken by Mr. Jackson Gawith, doctor to the works.

These works are on an extensive scale, comprising carriage repairing and painting shop, 194 ft. by 163 ft., and 36 ft. in height up to the gables. The walls are faced with paviors, supplied by Messrs. Nash, of Slough. The floors are of wood blocks on concrete. The buildings are heated with exhaust steam conveyed through the sheds in 5-in. and 7-in. pipes. There are also stores, 208 ft. by 43 ft.; and saw-mill, 136 ft. by 55 ft. Already 50,000 cubic yards of excavation have been removed. It has taken 10,000 yards of concrete, two million of bricks, 350 tons of iron, 400 squares of roofing, 1,400 tons of lime, supplied by Messrs. Greaves, Bull, & Lakin; the ironwork by the Horsley Iron Company, Tipton. The glass was supplied by Messrs. Hawkes, of Birmingham.

The plans were prepared by the Company's engineer, Mr. J. Tomlinson. The contractor for the work is Mr. J. Garlick, Saltley Works, Birmingham. The clerk of works is Mr. John Winstone; the manager of the works, Mr. Henry Charlton, under whose personal supervision the works were carried out. The total cost was about 30,000*l*. Additional buildings are contemplated.

* A view of one of these, Tavistock Chambers, Southampton-street, Strand, will be found in our volume for 1867, p. 375.

STAINES.

A NEW river-wall is being constructed at the back of the new Town-hall, Staines, in order to obtain a regular frontage-line to the river, together with a convenient landing-stage and steps leading to the new roadway at the side of the Town-hall. It is being built partly with bricks and partly with cement concrete rusticated blocks, and will form a retaining-wall to the vacant land at the side of the river. It will be raised, in order to prevent the land from being swamped by the winter floods. The spare land will, in all probability, be sold for building purposes, in plots suitable for a class of house much needed in the town. The whole of the works are being carried out by Mr. Ralph Fitt, C.E., the surveyor to the Staines Local Board.

On Monday morning last Joseph Bowley, a builder, was fined 4*l*., and 15*s*. costs, for failing to give notice of intention to build, and deposit plans with the surveyor, according to the by-laws.

THE PRESERVATION OF WOOD.

IN order to protect organic substances, for some time at least, against putrefaction, they are, as is well known, impregnated with salt. This process, according to Dr. Krätzer, may also with advantage be applied in the preservation of wood. It has been noticed as a matter of fact that timbering supporting the roofs of salt-mines remains quite unchanged for some considerable time. Cooking salt or common cattle salt recommends itself, therefore, as the cheapest and most practicable means for preserving posts, piles, and, indeed, any woodwork exposed to damp, so as to prevent its rotting in the ground. Cattle salt is solved in warm water to saturation. Into this concentrated solution the wood, which must be well dried, is put, if not of too large dimensions, and left in it for a certain time. Scantlings of large size are coated with the solution until the wood no longer absorbs any more. Posts and piles driven into the ground are best surrounded with a layer of salt, which on its solution soaks into the wood and thus preserves it. Wood thus treated possesses also the advantage of not being attacked by insects or worms.

THE SURVEYORS' INSTITUTION.

WE hear from the Council that the Institution of Surveyors has now been incorporated by Royal Charter, under the above title, by Letters Patent under the Great Seal. Members of the Institution will, in future, be denominated Fellows, with the right to use the designatory letters F.S.I. after their names. The class of Associates is to be subdivided into two classes, Professional Associates and Associates. Present surveyor-Associates are to be placed in the former of these two classes, and are accorded the right to use the distinctive letters P.A.S.I. after their names.

Provision is made for the gradual introduction of the system of examinations for all classes of members which has already been foreshadowed in the education scheme for students, in operation for some time past.

SMOKY CHIMNEYS.

SIR,—I should be much obliged if you could give me any information as to where I could find any particulars about an invention, mentioned in the *Builder*, for curing a smoky chimney, by applying fine wire gauze in front of the fire-place, the atmospheric pressure preventing the smoke from penetrating the gauze. The book in which I saw it mentioned was published ten years ago. J. H. BALL.

*** We are not able to refer, nor does it seem necessary, the suggestion being complete in itself. We print the note, so that any of our readers who may have tried the experiment may tell us the result.

OBITUARY.

The Late Mr. Rendle.—We regret to have to announce the death of Mr. William Edgcumbe Rendle, of Westminster (formerly of Plymouth), who expired on the 3rd instant, at Eastbourne, after a long and severe illness, and who was interred on Thursday last at the Brompton Cemetery. He was born at Compton Giffard, near Plymouth, on February 10th, 1820. He was engaged in several large mercantile pursuits, and was patentee and inventor of what is now known as Rendle's Patent Glazing, which is adopted by H.M. Government and all the leading railways, his latest and largest work being the great Citadel Station at Carlisle. He was also successful in theatrical matters, and was partner with Mr. Augustus Harris, at Drury-lane Theatre, when "The World" was produced. He was also lessee of the Imperial Theatre, Westminster, and proprietor of the Clarendon Hotel, Brighton.

COMPETITIONS.

Darlington Board School.—At a recent meeting of the Darlington School Board, called for the purpose of considering competitive drawings for proposed additions and alterations to the Bank Top Schools, the design of Mr. G. G. Hoskins, F.R.I.B.A., of Darlington, was unanimously selected. The competition was confined to architects resident in Darlington.

Fulham Union Infirmary.—Designs in a limited competition for a new infirmary for the Fulham Union, at Hammersmith, have been sent in. The estimated cost is about 40,000*l.*

BASINGSTOKE BOROUGH SURVEYORSHIP.

SIR,—Being perfectly disinterested in the above appointment, I feel I can say a few words as to the very unfair way in which it has been made, and at the same time show those gentlemen who were applicants how their applications and testimonials were treated. The usual monthly meeting of the Town Council was held on the 1st inst., and after a few preliminary matters had been settled, they proceeded to elect the surveyor. The 129 applications were opened before the meeting, and the name and residence only of each were read. The ex-mayor remarked that he thought they ought to select (say) half a dozen names from those whom they knew, and who lived in the vicinity of the town, and choose from them; but this was not the general opinion of the meeting. However, the present surveyor's foreman was proposed and seconded, and as an amendment another local candidate, in the shape of a gentleman who has a stonemasonry business in the town, was also proposed and seconded, and upon a division the foreman had it by a majority of three, and was declared by the mayor to be duly elected. IMPARTIAL.

*** A more shameful proceeding of the kind never took place. The gentleman elected may, for anything we know to the contrary, be a thoroughly proper man for the post, but the Town Council, having induced a large number of gentlemen to become candidates, ought to have considered themselves bound in honour to examine their testimonials and weigh their merits.

STONE.

SIR,—Referring to your paragraph as to Messrs. W. H. & L. Collingridge having announced the completion of their new building, 148 and 149, Aldersgate-street, I beg to call the attention of your readers to the beautiful façade of the said building, which is of Red Corsehill Stone. SAMUEL TRICKETT.

BATS.

SIR,—Can any of your readers inform me how to expel bats from the inside oak roof of a church?

EDWARD STORY.

New College of Practical Engineering.—A new College of Practical Engineering has been opened at Muswell-hill, near London, under the auspices of a number of practical engineers in the kingdom, among whom we may mention Sir John Anderson, late chief engineer at Woolwich; Sir Henry Bessemer, inventor of the Bessemer process; Sir R. M. Stephenson, founder of railways in the East; and many more. The principal of the college is Mr. John Bourne, C.E., well known by his works on the steam-engine and other kindred subjects. The instruction given will combine theory with practice. One main distinction which its teaching will present is that there will be no cramming, and that everything taught will be permanently and practically useful. Another special feature will be that a number of treatises illustrative of engineering art will be produced at the college, forming together an engineer's library. The hands of the students will be educated as well as their heads.

Books.

The Purchase of Gas and Water Works. By ARTHUR SILVERTHORNE, Consulting Engineer. London: Crosby Lockwood & Co. 1881.

THE Statistics of Gas Undertakings under the Management of Local Authorities, and of London Gas Undertakings under the Management of Local Companies, in the first part of this book; and the Statistics of Water Undertakings under the Management of Local Authorities, and of London Water Undertakings under Local Companies, in the second part, will be found of great use. These have been collected with care, and Mr. Silverthorne, in his preface, acknowledges the assistance he received from the Local Authorities, without whose co-operation much of the information could not possibly have been brought together. These returns afford pregnant texts for disquisitions.

VARIORUM.

ACCORDING to the *Press News*, a very fine work on the City of Paris is now in the press, and is to be published in a thick folio volume as the end of the present year. It is divided into a number of monographs, the compilation of which has been entrusted to some of the most prominent amongst living French authors, together with a list of specialists in Art, Science, and Literature. The various sections are headed "History, Streets and Promenades, Opera, Parisian Fashions, Theatres, Monuments, Life in Paris, High Life, Eating and Drinking, Clubs, the Press, Sport, Political Life and Institutions, Palace of Justice and the Bar, the Water, Prefecture of Police, Artistic Life, Art Collections, Paris from a Balloon," &c. More than 700 illustrations on wood and in zincography and chromo-lithography are to accompany the text.——Cassell's *Popular Educator* gives an explanatory sentence on Engrossing:—"Amongst lawyers the term *engrossing* means the making of a fair copy of any document on a paper or parchment in clear and distinct characters, or, in other words, to transcribe in a legible manner the rough draft of any deed that has been prepared for transcription by a lawyer or barrister. This knowledge will help us to ascertain the meaning of the word *engross*. It is derived, as a little examination is sufficient to show, from the French proposition *en*, in, and the adjective *gros*, large. The expression *to engross*, in its literal acceptation, means to make large, and therefore distinct, as the larger in reason are the characters in which a document is written the more distinct and legible they are. Hence the word *engross*, which, in its primary sense, merely means to make large, has taken a secondary meaning, namely, to copy writing in large or distinct characters: and we can also trace the force of the simple and original meaning in a third signification that has been assigned to the word, when we speak of a person who is occupied in some absorbing pursuit as being wholly engrossed in his occupation—his employment, be it what it may, having taken such a hold on him, and assumed such large proportions in his mind, that he has little or no room there, if we may be permitted to use the expression, for other thoughts."

Miscellanea.

The National Standard Land, Mortgage, and Investment Company, Limited.—The objects of this company, advertised in our present number, include the purchase, sale, and development of large or small estates; the advancing of money on land and buildings, or on debentures and other securities; and the erecting of houses and buildings, and draining or improving the same. The prospectus shows, from an examination of the balance sheets of existing and land investment companies, that considerable profits may be looked for from this class of business if properly conducted. Mr. Edmund Woodthorpe, F.R.I.B.A., is surveyor to the company.

Cardiff.—The new Board of Trade offices have been opened at Cardiff Docks. They were built by Messrs. Kirk & Randall, Woolwich, to designs by Mr. Rivers, surveyor to the Board of Works, and form part of a Government block of offices, including postal and telegraph departments, erected at a cost of 14,000*l.* The site cost about 5,000*l.* in addition.

Sluicing the Pluckington Bank, Liverpool.—The works for carrying out this operation, upon which we commented a short time ago, are now practically complete, and very soon their effectiveness will be put to the test. The *Liverpool Daily Post* thus describes the works which have been executed:—From the George's Dock to the river wall immediately at the back of the George's Stage there is run through the Pierhead an immense pipe or culvert 10 ft. in diameter. This is for the conveyance of water from the dock to the sluicing apparatus, which is constructed at a lower level along by the river wall. There is at the end of this culvert a means of stopping the overflow of water, and this apparatus is worked from the Pierhead. Extending from this monster pipe there is another pipe of almost equal dimensions branching off from it at right angles, which traverses the shore at the back of the George's Stage. From this pipe there are twenty-two subsidiary pipes or outlets running at right angles to it and in the direction of the stage. The diameter of each of these pipes is 4 ft.; the length of each pipe is 45 ft.; and they are laid at a level of 10 ft. below the old dock sill. Each of the sluices is provided with a "clough" or dam, so that the water may, if necessary, be shut off from them. Thus they can be all worked, or only such of them as shall be deemed expedient. Such is the construction of the sluicing apparatus by the aid of which it is hoped that the Pluckington Bank will be washed away. The water available for the sluicing operations is by no means limited to that of the George's Dock. The whole line of the south docks can, if need be, be brought into requisition for the purpose.

Growth of a Co-operative Society.—An interesting account of the progress of the Wholesale Co-operative Society has been published by the *Manchester Guardian*, and some of its particulars are worth reproducing for the lesson they convey. The society was established in 1863, and is a federation of retail co-operative societies carrying on business all over England and Wales. At its start it had a capital of only 999*l.*, and did business in its first year to the extent of but 5,962*l.* Only forty societies were embraced in it, with an aggregate membership of 17,545*l.* According to its balance-sheet, made up at the 25th of June last, 618 different societies have now got shares in it, and 778 purchase their goods through it. Its capital, share, loan, and reserve, is now 563,907*l.*, and the last quarter's sales amounted to 862,000*l.*, those for the whole year being 3,389,000*l.* During the seventeen years of its existence this society has done a business of nearly 28,000,000*l.*, at a cost of only 362,786*l.*, or 1*l.* 8*s.* 1*d.* per cent., its net profits in the same period averaging 1*l.* 4*s.* 2*d.* per cent., which was enough to pay the 5 per cent. fixed interest on the capital, and an average dividend of 8½ per cent. in addition. The society has buyers in Ireland, Rouen, and New York, and latterly in Copenhagen; and it possesses two manufactories of boots and shoes, one in Leicester and one in Heckmondwike, but these have caused some dispute as to the allocation of profits, the workmen declaring that the profits of labour ought not to be divided on the same basis as the profits of the distributing trade.

Wesleyan Orphanage.—An addition to the benevolent institutions of the Midland district is about to be made by the erection of a Wesleyan orphanage near Erdington, Birmingham. Some time ago Mr. S. Jevons, a former resident in Birmingham, and one of the trustees of Sir Josiah Mason's Orphanage, offered to subscribe 10,000*l.*, if the Wesleyan Conference would vote a similar sum from the Thanksgiving Fund for the purpose of erecting an orphanage for the children of Christian parents. The offer was accepted, and 18 acres of land have now been purchased at a cost of 2,700*l.* in the neighbourhood of Oscott College. It is intended to begin building operations within a short period, and it has been decided that the institution shall consist chiefly of small detached homes, similar to others under the superintendence of the Rev. T. B. Stephenson, in Bonner-road, Victoria Park, London.

Safety Tap.—Messrs. John Warner & Sons, of Crescent Foundry, Cripplegate, tell us that their Mr. Goslin has just invented a safety tap for close boilers, kitchen ranges, and hot water heating apparatus, which, amongst its advantages, can be regulated to suit any and every pressure.

The Metropolitan Gas Companies.—A Parliamentary paper has been issued giving the results of the working of the metropolitan gas companies for 1880. It appears that the total capital and borrowed money of all the companies is 13,025,955*l.*, the Gaslight and Coke (the largest gas company in the world) standing for 9,469,943*l.*, the Commercial for 745,845*l.*, the London for 858,675*l.*, and the South Metropolitan for 1,951,490*l.* The total income from all sources was in the case of the Gaslight and Coke Company, 2,615,979*l.*; Commercial, 316,440*l.*; London, 315,036*l.*; and South Metropolitan, 745,842*l.*, or a total of 3,993,298*l.* The gross profit of the Gaslight and Coke Company was 899,909*l.*; of the Commercial, 102,224*l.*; of the London, 69,615*l.*; and of the South Metropolitan, 221,935*l.*; together, 1,293,684*l.* On capital and borrowed money this profit was equal to 9*l.* 10*s.* per cent. in the case of the Gaslight and Coke Company, 13*l.* 4*s.* 2*d.* per cent. in that of the Commercial, 8*l.* 2*s.* 2*d.* in that of the London, and 11*l.* 7*s.* 6*d.* in the case of the South Metropolitan,—the average of the whole being 9*l.* 18*s.* 8*d.* per cent.; while on the gas rental the profit per cent. was 45*l.* 7*s.* 2*d.*, 43*l.* 4*s.* 11*d.*, 29*l.* 4*s.* 1*d.*, and 40*l.* 4*s.* in the case of the four companies respectively.

Condition of Athens.—An alarming outbreak of typhoidal fever in Athens is reported, without much surprise to those who know the disregard of sanitary precautions practised there. The *Times* correspondent says:—"The mayor, who has certain duties still permitted him, in his anxiety to keep up the water supply through this exceptionally hot summer had turned into the main reservoir a stream in which the washerwomen of Cephissia have had from time immemorial their washing pools, and where is washed the linen of Athens, with its hospitals, civil and military; and the streets of the city, the windiest and dustiest in Europe, have been sprinkled with its waste waters, so that the dust, even, is charged with the desiccated matters contained in this waste water. If nature had not provided Athens with the purest air and the most salubrious position possible, the plague would have made its breeding-place here long ago." The authorities are moving in such directions as they may; but until the hot season is over, and the rains return in the latter part of September, or possibly not before the middle of October, nothing, it is thought, can be done effectually.

Statue of Marco Polo in Venice.—A statue of Marco Polo, discovered in Canton, has been received at his native city, Venice. It is life-size, made of wood, and gilt. According to a foreign contemporary, the famous Venetian traveller is represented seated, wearing the Chinese attire, although the cloak and hat are after the European fashion. His moustache and beard, which surround his face, are tinged dark blue, and while the Chinese artist has given him a peculiar form, the features in no way resemble those of a Mongolian type. Opposite the large red easy arm-chair, upon which Marco Polo is seated, is placed a porcelain bowl, intended to receive perfumes with which he was honoured in the same manner as is the protecting genius of China in the temple of Canton. The statue has at the foot an inscription in Chinese characters.

Window, Mansfield. — Messrs. Pitman & Son, 30, Newgate-street, have executed a stained-glass window for the west end of St. Chad's Church, Stuffynwood, Mansfield, Notts. It is a three-light window with lancet heads and tracery. The centre compartment contains a figure of St. Chad, robed in episcopal vestments, holding in one hand a pastoral staff, and in the other the model of a church. He was Bishop of Lichfield (on the borders of which diocese this church stands), and according to the calendar of the English Church, March 2nd is St. Chad's day. The side windows are filled with geometrical designs in leaded glass.

Dover Priory Gateway.—We have received a somewhat intemperate letter from an "Inhabitant of Dover" complaining of the substitution of an eminent London architect in the restoration of the Priory Gateway (for the purposes of the Dover College), for the local architect who has always acted for the college. Doubtless there were sufficient reasons. Anyhow we decline to print the letter.

Royal Manchester Institution. — The annual exhibition of modern works of art here, the sixty-first, was opened to the public on the 7th inst.

New Wesleyan Chapel, Walton-le-Dale. The corner-stone and memorial-stones of this chapel have been laid. The site contains 519 super. square yards. The style is Gothic. The building is to be of brick, with stone dressings, having ornamental brick panels in the gable and in other parts of the structure. The internal woodwork will be of pitch pine, stained and varnished. The roof will be open timbered, having carved and moulded principals. The dimensions of the chapel will be 52 ft. 3 in. by 29 ft. There will be a transept on the east side, a chancel measuring 19 ft. by 9 ft., and a vestry in the rear. The whole contract, including the pulpit, heating apparatus, gas-fittings, railings, gates, &c., has been let to Mr. H. Ward, of Preston, for 1,277*l.* 19*s.* 4*d.* The architects are Messrs. Myres, Veevers, & Myres.

Singular Cause of a Fire.—Some time ago the suspension-bridge of Mr. Roebling, crossing the Alleghany, near Pittsburgh, U.S., was almost destroyed by fire. At first it was found impossible to discover how the bridge could have caught fire. Further investigation has led to the conclusion that it arose from the fact that thousands of sparrows had been in the habit of building their nests of hay and straw in the interstices of the woodwork of the under portion of the structure. The conflagration was caused by sparks from the chimneys of the steamers plying upon the river beneath lodging in and kindling some of these nests.

The Parkes Museum.—This museum is closed till October, when it will again be opened free to the public on Tuesdays, Thursdays, and Saturdays; and during the winter, lectures on sanitary science will be given in the museum, illustrated with the appliances deposited in the museum, and many contributions sent from the recent exhibition at South Kensington. We believe it is intended to distribute the awards to the exhibitors at the public annual meeting of the subscribers to the museum in October or November.

New Sunday Schools at Kidderminster are about to be erected by the Baptist denomination, from plans prepared by Messrs. Ingall & Hughes, architects, Birmingham. They provide a spacious central room for massing the children at the opening and close of the schools; also twenty class-rooms, — ten downstairs and ten upstairs, — opening into a gallery round three sides of the room. The builder is Mr. R. Thompson, of Kidderminster, the amount of whose contract is 1,989*l.* 10*s.*

Liverpool and Southport.—Of the new North Docks (opened by H.R.H. the Prince of Wales on Thursday last), of the Royal Court Theatre (to be opened this Saturday, the 10th), and of other new works in Liverpool, as well as of the new market at Southport opened on Wednesday last, we are compelled by exigencies of space to postpone particulars to next week.

Surveyors' Salaries, Eastbourne. — The salary of the town surveyor of Eastbourne (Mr. Charles Tomes) has been raised by 100*l.*,—from 275*l.* to 375*l.* The salary of the building surveyor (Mr. E. W. C. F. Schmidt) has been increased by 35*l.*

Art Director.—We are informed that Mr. Thomas Armstrong will succeed Mr. Poynter, R.A., as Art Director at South Kensington, and Mr. Sparkes (now head-master) as Principal of the National Art Training School.

Fine Art Exhibition at Bolton.—A fine-art exhibition, in aid of the Bolton Infirmary, was opened in the new buildings of that institution on the 5th inst.

The New Townhall at Hastings was opened on Wednesday, the 7th inst. In our last volume (pp. 570, 572) we published a view, plan, and description of the building.

TENDERS

For the erection of a school residence for young ladies, at Goudhurst, Kent, for the Rev. J. J. Kendon. Mr. Wm. Theobalds, architect. No quantities:—

Fowler	£1,067 0 0
Warrington	1,000 12 8
Marshall Bros.	1,000 0 0
Bingham	997 0 0
Martin	960 0 0
Morris	950 0 0
Tulley	947 0 0
Player	915 0 0

For alterations at 22, 23, and 24, Argyll-street, and 252, and 254, Regent-street:—

	Complete in 10 weeks.	13 weeks.	16 weeks.
Hall, Bedall, & Co.	—	£3,970	£3,970
Macey & Sons	3,900	3,620	3,499
Bywaters	3,894	3,494	3,254
Olemence	3,500	3,341	3,181

For works of town drainage and sewage disposal for the Chard Urban and Rural Sanitary Authorities. Mr. Charles W. Whitaker, engineer:—

Hunter	£6,181 0 0
Trimm	5,200 0 0
Hawkins	5,100 0 0
Botterill	5,021 0 0
Rendle	4,950 0 0
Coldridge	4,850 0 0
Brown	4,719 0 0
Bottoms	4,610 0 0
Frayne & Co.	4,507 0 0
Krauss	4,499 0 0
Crocham	4,456 0 0
Langdon & Poole	4,400 0 0
Hayward (accepted)	4,277 0 0

For the erection of three shops and premises in Market-street, Coventry, for Messrs. R. B. & T. Burbidge. Herbert W. Chattaway, architect:—

J. Marriott, Coventry	£900 0 0
H. Price, Coventry	810 10 0
G. Frith, Coventry	802 0 0
E. Smith & Son, Kenilworth	799 0 0
Hallam & Co., Coventry	795 0 0
J. Woof, Coventry	780 0 0
J. Worwood, Coventry	773 0 0
G. Storer, Coventry	750 0 0
C. Haywood, jun., Coventry	710 0 0
Thos. Mayo, Coventry (accepted)	667 0 0

For taking down and rebuilding Cock Roads Farmhouse, Hill, Southampton, for Colonel Atterley. Mr. R. Critchow, architect. Quantities by Mr. E. T. Howell, surveyor:—

Chapman, Itchen	£513 0 0
Brinton & Bone, Southampton	465 0 0
Bostock, Southampton	431 7 4
Dyer, Portswood (accepted)	426 0 0

For taking down and rebuilding Wellington Foundry Charles-street, City-road, for Mr. B. Slater. Mr. Thomas Milbourn, architect:—

Sabey & Son	£1,285 0 0
R Marr	1,264 0 0
Staines & Son	1,186 0 0
Langmead & Way	1,144 0 0
J. H. Fernley	1,085 0 0
Palmer & Sons	1,068 0 0
W. Royal	1,068 0 0
J. Auler	1,045 0 0
Snow & Co.	1,033 0 0
R. Conder	1,029 0 0
G Crabb	998 0 0
W. & H. Salmon	924 19 9

Accepted for the erection of three villa residences at Arcside, near Grange, Westmoreland, for Mr. William Mitchell. Mr. William J. Newton, architect:—

W. & B. Hinchcliffe,* (Masons, &c.†)	£800 0 0
J. G. Parker, Windhill (Joiner)	396 0 0
M. Bland (Plasterer)	150 0 0
A. Hill (Slater)	102 0 0
S. Ullathorne (Plumber)	100 0 0
G. E. Atkia (Painter)	65 0 0

* All the contractors, except for joinery, are of Bradford
† Wall stones found.

For the erection of residence at Willow Grove, Chiselhurst, for Mr. H. E. Tindall. Mr. A. R. Stenning, architect. No quantities supplied:—
T. Crossley, Bromley (accepted).

For the erection of a warehouse at Willow Brook Grove, Trafalgar-road, Old Kent-road, for Mr. Richard Nugent:—
George Brown, Peckham (accepted).

For the erection of a house and laundry in Park-road, North Acton, for Mr. J. Howell, jun. Mr. N. Kempthorne, architect:—
Huntley & Rooney, Acton (accepted) £545 10 0

Accepted for granite, ballast, and hoggin, per cubic yard, for the Local Board, Wanstead:—

	Leicester.	Guernsey.
	s. d.	s. d.
Granite, delivered at Station.		
John Mowlem & Co., Grosvenor Wharf	11 3	... 12 3
Ballast, delivered on the Roads.		
Frederick Stock, New Wanstead	6 6	
John Richards, Woodbine-place	6 6	
Thomas Skennerton, jun., Woodbine-place	6 0	
Hoggin, delivered on the Roads.		
Thomas Skennerton, jun.	5 9	

Accepted for additions and alterations to parsonage house, for Mr. W. Dewe, Wyld Court. Brick, tiles, sand and lime provided. Mr. J. S. Dodd, architect:—

Morton (Bricklayer)	£165 0 0
Fulker (Carpenter)	175 0 0
Jackson (Plumber and Ironwork)	81 7 0
Phillips (Glazier)	28 0 0

For additions to Elm Cottage, South Stoke, for Mr. J. King. Bricks, &c., provided. Mr. J. S. Dodd, architect:—

Brasher, Wallingford	£516 0 0
Dodd, Caversham	515 0 0
Holly & Butler, Nettlebed	500 0 0
Smallbone, Streatley (accepted)	479 0 0

For additions to gardener's cottage, Wallingford, for Mr. J. K. Hedges. Mr. J. S. Dodd, architect:—

Holly & Butler, Nettlebed	£258 0 0
Weller, Wallingford	249 0 0
Brasher, Wallingford (accepted)	232 15 0

For painter's work and general repairs to the Cottage Sonning, for Mr J. Hunt. Mr. J. S. Dodd, architect:—

Harris, Reading	£182 10 8
Sisley & Goddall, Reading	179 16 0
Brown, Sonning (accepted)	175 10 0

For residence at Holly Park, Crouch-hill, Hornsey. Mr. F. Chambers, architect:—

Smith & Sons	£2,139	0	0
Pocock	1,965	0	0
Castle	1,880	0	0
Gould & Brand	1,839	0	0
J. Grover	1,822	0	0
Haisman	1,799	0	0
Shurmur	1,683	0	0

For proposed new children's ward, West Kent General Hospital, Maidstone. Mr. E. W. Stephens, architect:—

Higgs, London	£1,949	0	0
Caliand, Rochester	1,920	0	0
Paramore, Margate	1,900	0	0
Simmonds, Maidstone	1,894	0	0
Naylor, Rochester	1,879	0	0
Hammond, Aylesford	1,852	16	10
Warr, Croydon	1,811	9	0
Wallis & Clements, Maidstone	1,798	0	0
Cox Brothers, Maidstone	1,775	0	0
R. Vaughan, Maidstone	1,760	0	0
Avard, Maidstone	1,729	0	0

For a pair of cottages at Rokeby-road, New Cross, for Mr. John Ley. Mr. W. T. Hunt, jun., architect:—

Boorer	£690	0	0
Holloway	689	0	0
Rodwell	643	0	0
A. & F. Smith	605	0	0
Hubble & Trott	595	0	0
Jerrard	592	0	0
Redman (accepted)	575	0	0

For Maidstone Cattle Market. Mr. E. W. Stephens, architect:—

Builder's Work.

Wallis & Clements, Maidstone	£187	0	0
E. Vaughan, Maidstone	184	0	0
Cox Bros., Maidstone	180	0	0
Gray, Maidstone	179	0	0
Avard, Maidstone	174	0	0
Elmore, Maidstone	167	0	0
Simmonds, Maidstone	162	0	0

Ironfounder's Work.

W. Rammage, Stratford	£902	16	5
Jukes, Coulson, Stokes, & Co., Loadon	721	0	0
W. Weeks & Son, Maidstone	660	0	0
Goddard & Massey, Nottingham	585	10	0
Joseph Stone, Southwark	548	17	4
Baylis, Jones, & Bayliss, Wolverhampton	518	1	0
Messrs. Bretteli, Worcester	501	5	8
Balls, Garrett, & Co., Maidstone	498	0	0

For new roof over Elementary Room, for the Nottingham School of Art. Messrs. S. Dutton Walker & Howitt, architects:—

Scott	£850	0	0
Vickers	830	0	0
Lynam	799	0	0
Bell & Son	798	0	0
Clarke	768	0	0
Fish & Son	705	0	0
Jelley, Nottingham (accepted)	666	15	0

For new "Plant Form" studio for the Nottingham School of Art:—

Messenger, Loughborough (accepted)	£902	10	0

For new schools in connexion with St. Andrew's Church, Thornhill-square. Mr. William Smith, architect:—

Larke	£1,870	0	0
Dunford & Langham	1,689	0	0
Mattock	1,671	0	0
Harper	1,632	0	0
Shurmur	1,583	0	0
Cole & Chant	1,555	0	0
Stevens	1,548	0	0

For warehouse, Hoxton-square, for Messrs. M. A. Harper & Co. Mr. William Smith, architect:—

Shurmur	£1,090	0	0
Harper	1,075	0	0
Dunford	1,039	0	0
Mattock	933	0	0
Wilkinson	917	0	0
Larke	890	0	0
Stevens	887	0	0
Steele Bros.	875	0	0

For paving, channelling, and making up Croydon-street, for St. George's Sanitary Authority. Mr. Wm. Dawson, C.E., surveyor to the Board:—

Kirby & Hickory	£323	8	4
Adams	295	2	8
Parke	295	2	6
Caise & Day	289	15	4
Derrick	285	6	6
Lovell	280	10	10
Osborne	272	14	8
Martin & Mooday	265	13	9
Brittan & Froude	266	13	4

For sundry alterations, additions, and decorations to Thames Ditton House, Thames Ditton, Surrey, for Mr. W. W. Fitzwilliam Dick:—

J. Vears & Co. (accepted)	£1,596	0	0

For converting two private houses into shops, Stroud Green-road. Mr. William Smith, architect:—

Harper	£725	0	0
Dunford & Langham	646	0	0
Mattock Bros.	593	0	0
Larke	584	0	0
Wilkinson	473	0	0

For pulling down and rebuilding the Royal Paper Mills, Wallington Bridge, Surrey. For Mr. A. Smee. Mr. Richard Creed, architect:—

Cuthbert	£394	10	0
Colls & Son	839	0	0
Smith & Sons	807	0	0
Stewart	778	0	0
Read	760	0	0
H. & E. Smith	735	0	0
Humphries	705	0	0

For sundry alterations and repairs to Nos. 354, 356, and 358, Mile End-road. Mr. C. A. Legg, architect. Quantities by Mr. Wm. Hawker:—

Stokes	£897	0	0!
Judd	699	0	0
Calnan	524	0	0
Vear	515	0	0
Lusk	478	0	0
Parish	420	0	0!

TO CORRESPONDENTS.

Vergers of York Minster.—We have received some letters on this subject, pro and con, too late for consideration this week.—W. J. L.—L. L.—B vander B—M. H. J.—T. L.—G. F. H.—H. E. B.—J. F. D.—E. W. & Son—W. F. G.—I. S.—D. & Son—D. W.—J. C. R.—A. S. J.—J. V. & Co.—W. D.—C. F. H.—T. F. A. A.—W. S. W. N.—E. W. S.—S. S.—E. C. R.—C. T.—W. S. C. W. W.—Dr. P. T. C. M.—O. S.—C.—H. T. T.—Miss B.—"South Aspect."—J. N.—K.—J. B. P. Bros.—H. W. C.—S. T.—J. & W.—C. F. K.—T. M.—G. B.—T. R. S.—J. N. C.—H. G.—C. S.—C. K. B.—R. & E. S.—W. T. C. & Co.—R. F.—R. F.—J. B. L.—T. C. S.—W. G. T. (illegible)—R. K. (thanks)—"Seaside" (next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles and papers read at public meetings, rests, of course, with the authors.

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Decoration of the Central Hall, Houses of Parliament.

ABOUT a month since we made note of the recurrence of one of those little passages of arms on an artistic question which occur now and then in our legislative assembly, just to remind its members, apparently, that there is such a thing in the world as art. It is true that whenever such discussions are raised we hear that the House was very empty, and the discussions are usually carried on by two or three members who habitually profess an interest in art, and who are nearly certain to be heard if any such subject is raised. As a general rule, it may be added that the art-critics of the House are pessimists, and that they are usually in opposition to anything whatever that is proposed, not because they are indifferent, but because, according to their account, everything is so hopelessly bad in modern art that it is no use doing anything at all.

The particular discussion we refer to was raised (on the 16th of August) by Mr. Schreiber, in reference to the three panels in the Central Hall which are still left blank, wanting the pictorial designs, of some kind, which they were intended to receive. Mr. Schreiber called attention to the fact that the completion of the decorative scheme of the Central Hall had been left in abeyance for twelve years, except in regard to the one panel occupied by the mosaic reproduction of Mr. Poynter's fine design of St. George. Mr. Schreiber intimated that he did not intend to let the question alone, and before the House separated for the recess he wished to know whether the Government had any policy in regard to the Central Hall, and if so, what it was. Referring to the partial failure and great tendency to decay exhibited in some of the frescoes, he disclaimed any intention to ask for money for the completion of the decoration in that medium, which had led to so much disappointment. Besides, the decoration scheme might now be said to be "under the mosaic dispensation," one mosaic picture having already been executed. Mr. Schreiber said that having been absent from the House for twelve years he had been much disappointed to find after all that time the decoration of the Central Hall still unfinished; and he had asked the late Mr. Adam when it was intended to complete it, and whether he was in possession of the designs for the three vacant panels. The reply seems to have been, like the panels, a blank: all that was elicited was that there had been much discussion about the matter in 1870-71, but that no definite conclusions had been arrived at. Whether designs for the three panels had been made, or were in possession of the then Commissioner of Works, did not appear. Mr. Schreiber said he intended to press the point next Session, and if he did not then find that Mr. Poynter had been commissioned to prepare a design for "St. Patrick" he should appeal to the patriotic feelings of the Irish members in regard to the exclusion of their patron saint from the House. That it would be necessary to get up some such side-play on the subject to awaken any real interest in it, is, we fear, likely enough. Mr. Schreiber concluded for that occasion with a motion that the decoration of the Central Hall, interrupted twelve years ago, should be resumed and completed in mosaics.

So far Mr. Schreiber, on the occasion in question. It remains to consider what response was elicited by this well-meant proposition, and what, as far as our judgment goes, is the real truth of the matter. As far as any ostensible response was elicited at the time, it was almost entirely of a negative character, and was confined to some criticisms by Mr. Cavendish Bentinck, and the reply of the First Commissioner, Mr. Shaw Lefevre. The remarks of the former gentleman showed little thought or consideration, and were only too typical of the tone frequently taken by the few amateur art-critics who are numbered among our Parliamentary representatives. According to Mr. Bentinck, everything to be had was so bad that it was useless to do anything. All the frescoes in the House were failures, all the mosaics that had been executed in England were failures, including the mosaic picture of St. George, already executed. The remedy, according to Mr. Bentinck, was to do nothing. The mosaics in St. Paul's, by two of the greatest living artists, were total failures, and an awful warning against attempting anything of the kind. The most original reason, however, for Mr. Bentinck's let-alone policy was that the decoration of great national edifices had never been finished at once,—it had always been the work of many generations. The argument seems to be, therefore, no decoration that is worth anything can be accomplished unless it is allowed to drag out in a similar manner. It would be waste of time to bring counter-arguments against such logic as this.

The reply of the First Commissioner resolved itself into this,—that the existing mosaic had not given satisfaction; that the artist had, in fact, wished to have a portion of it cut out, in order to be better carried out *de novo* (this would seem to imply that the dissatisfaction was with the execution, not with the design); and that the committee of artists, called together by Mr. Ayrton (ominous name in connexion with such a subject), which included Messrs. Poynter, Pope, Herbert, and Armitage, had recommended that the remaining panels should be filled in with fresco. Having in view the generally unsatisfactory opinion about the existing frescoes in the House, he could not feel justified in asking for a vote for the fresco scheme. In regard to the mosaic scheme he considered it would be very undesirable to go into that, unless there were an assurance that the work executed would represent the highest art. The breaking up of the mosaic school at South Kensington had deprived them of one means of obtaining the execution of the work, and in the present unsatisfactory state of mosaic art, it would be better to leave the panels incomplete. Result,—motion negatived.

It is exceedingly unsatisfactory and annoying to find this sort of tone taken in Parliament on what seems a most reasonable proposition to make some endeavour to worthily complete the decoration of what is architecturally the finest portion of the House. Before considering the main subject, we may observe that we by no means admit the *dictum* of Mr. Bentinck that the mosaics in St. Paul's are entire failures, nor do we know very well why the public or the House should be expected to take his word for it. We have always held that the introduction of such colossal figures into the architecture of St. Paul's was a very questionable expedient, inevitably dwarfing the scale; but that is beside the question. As mosaics, the two figures by Mr. Watts and Mr. Stevens are certainly worth something better than to be dismissed so cavalierly. Now in regard to the existing mosaic in the Central Hall at Westminster, it is under two decided disadvantages inseparable from its position, or almost inseparable. In the first place, it is on a flat surface, whereas mosaic is always most effective on a more or less concave surface, which by its diverse reflections brings out the brilliancy of the material. Secondly, it is in the daytime under a shadow formed by the deep reveal and archivolt of the arch which makes the framework to the panel; and the light being subdued by stained glass and admitted rather high up in the walls, there is only a very moderate amount of direct light upon the picture, and a considerable shadow thrown downwards over it from the upper portion of the arch. Our last inspection of the work was on a very dull day, which made the defects of the position more remarkable than usual. On a bright day it would show much better; and under artificial light, in which it must be viewed for at least a large proportion of the period during which the building is fully occupied, there is certainly nothing to prevent this and all the other panels, if similarly filled, from being well seen.

The difficulty in the daytime, in regard to effect, lies partly in the fact that the windows are filled with tolerably strong-coloured glass.

It should have been recognised at first that strong effects in polychromy cannot well be carried out on walls and in windows in the same apartment. For a perfectly satisfactory effect, you must choose between coloured decoration by reflected light and coloured decoration by transmitted light; both cannot be equally effective in the same place. There must, in the case of wall decoration by reflected light, be sufficient light admitted through the windows to give brilliant reflections; and the want of this is the drawback in the Central Hall. But still, this defect is only seriously felt on dull days, and is not in itself sufficient to furnish a reason for letting the matter alone altogether, and leaving these dull blank places in the generally rich design of the Central Hall.

We urge strongly, therefore, that the panels ought to be completed, that the action of the Member who drew attention to it before the close of the session was very opportune, and that something more ought to be heard about it when Parliament meets again; and there can be no doubt that when carried out, the new designs ought to be carried out in mosaic, the same material in which the present panel is executed. In regard to this point, we read with astonishment the statement that four artists, called in by Mr. Ayrton to enlighten his mind on the subject, recommended that the remaining panels should be treated in fresco. Surely these gentlemen must have based their recommendation on a supposition that the panels would never be seen sufficiently to distinguish fresco from mosaic; otherwise it is inexplicable how they could have recommended the juxtaposition of two such very opposite methods in the same apartment of a building. The whole design of the Central Hall is absolutely symmetrical, and to place on one face of it a mosaic with its reflecting surfaces and rich colour, and on the other three faces frescoes with their dead surfaces and necessarily rather low colours, is such an absurdity that we can hardly believe that four artists recommended it, and can only say that if they did, their ideas as to the relation of pictorial decoration and architectural effect must have been very hazy.

As to the prevalent opinion, for such we believe it is, that the large number of existing frescoes in the House are failures, a word may be said here. That the frescoes gave much trouble in regard to material failure every one knows; and the difficulty was, perhaps, in itself sufficient to deter any one, from a mere commercial point of view, from voting money to pay for more work of the same type. In regard to artistic effect, the frescoes in the House are, however, also in great measure failures, owing to defective æsthetic or bad position, or both. The two great paintings by Maclise, in the Royal Gallery, whatever degree of success they may be considered to have as paintings, are completely wanting in reference to the architectural design. They are obviously colossal afterthoughts; they are either too long for the gallery or not long enough; they should have either run the whole length of the walls, or they should have been confined to a well-marked central space, which should have appeared to be naturally left for such decorative treatment by the arrangement of the architectural design. As it is, they only suggest that two immense paintings have been got into the room, which have no necessary relation to the architectural scheme of the interior, and which it is impossible for any one perfectly to see either in regard to distance or lighting, for the light is for this purpose nearly as bad as it can be, it being impossible to look up at either painting without the eye being annoyed by the window over it, while the two cross-lights mutually interfere with each other on each painting. The moral is that when it is intended to introduce important paintings on a large scale as a permanent decoration to an interior, the architecture and the lighting should be designed from the first in reference to the painting. The frescoes in the corridors are better off in one point; they are distinctly prepared for in the architectural design, and form an integral part of it, or, at least, its necessary complement. The panels are prepared for the reception of a series of designs, and they fall naturally into their place. But there, again, are some failures in effect, partly from the same cause as in the Royal Gallery, the cross-lighting; which, coupled with the glazing that it has been found necessary to put over them, renders it exceedingly difficult to see them at all. There is also a mistake inherent in at least a good many of these works, viz., that the treatment is too distinctly pictorial,* either for the capabilities of fresco or for the position of the paintings in relation to the architecture, and that a degree of realism is attempted in some of them which cannot be satisfactorily attained in fresco, and consequently impresses us with an idea that the artist has missed his aim, and that the execution is coarse and unsatisfactory. This would have been avoided if a flatter, more conventional, and less pictorial treatment had been adopted, as would certainly have been done had the work been commenced now; but at the time these frescoes were commenced the value, and even necessity, of a certain marked conventionalism in such a situation, and with such a method, was not understood as it is now. It must be admitted, however, that even then there would have been difficulty in meeting the natural demand for historical truth of costume in paintings intended as representations of facts in the history of England, while preserving the conventional style.

It is in this sense that we agree that the frescoes in the House are to a certain extent failures is regard to their main object as decorative art. The difficulty in regard to realism would not be felt in reference to the class of subjects with which the large panels in the Central Hall are proposed to be filled. So far as that goes, fresco would be a very suitable medium for such designs as the St. George of Mr. Poynter, and others in a similar style and spirit. The reasons against it are, first, that the other frescoes have shown such great tendency to rapid decay (a consideration which from a commercial point of view, we must expect would impress itself strongly on members of the House who have seen these works peeling off before their eyes); secondly, that the one panel is now executed in mosaic, constituting a very fine design, to the merits of which the art-critics of the House seem remarkably blind; thirdly, that the very rich decoration of the vault and walls of the Central Hall requires mosaic as its highest point, and that the comparatively dull surface of fresco would be killed by the general effect of the apartment, and more especially by the stained glass. That the stained glass is an impediment to the effect even of the mosaic by stopping out too much light, we have already said; but as the glass is there and is not likely to be deliberately taken out again, there is no question that mosaic is the form of mural decoration which is best calculated to hold its own against the effect of stained glass windows, and that it is, in fact, the only form of wall decoration which it is worth while to introduce in the positions in question.

The objection that there is not English talent available at present to execute mosaic in a high style, if we are to admit the fact, certainly ought not to be taken as a reason for not proceeding with the work. We can at least go to English artists for the design, and if we cannot find in England the workmen, we must go elsewhere for them. Let it be observed, in conclusion, that the estimated cost of the three unfilled panels, reckoned on the basis of the already completed one, is only about 2,000*l.*; and it is surely not to be supposed that any large proportion of educated tax-payers would consider that an extravagant or unjustifiable outlay for completing the decoration of the central point of the national legislative building, even if circumstances preclude us from getting all the effect which we might wish to obtain. The incomplete state of the Central Hall is not creditable to us, either to our spirit and liberality in many matters, or to our artistic feeling; and though this latter element is, we fear, by no means well represented in the House (inasmuch as people are not elected to Parliament on account of their artistic culture), there must surely be a large section of the constituencies who would quite approve of going to some little expense in completing the decoration of a part of the House, in which, as it is a public place in time of session, they have as much direct interest as members themselves. We hope the point will be brought up again and satisfactorily settled next session. We have only recently recorded (see page 279, *ante*) the completion at Aix-la-Chapelle of an important work in mosaics, and the interest which the accomplishment of the work has excited in Germany. The state of our Central Hall at Westminster, and the apparent indifference of the Legislature about it, contrast ill with the account we then published.

* Some few of them, as will be remembered, are actually reproductions of oil-paintings, with very unsuccessful result when compared with the original paintings.

ELECTRICITY AND OUR FOOD SUPPLY.

THE most wonderful and important discovery yet made by man is, there can be no dispute, that of the mutual convertibility of the chemical, physical, and electric forces. We are not speaking of any single effort of imaginative genius, or of the mass of the contributions to science offered by any single pioneer of the army of discovery. Little by little the great truth has become clear. Little by little has the veil of Isis been raised, and the motto which is now being cut, in hieroglyphics more luminous than those which identify the mummies of Egyptian kings and conquerors, is in the terms, "TO MOVE IS TO BE."

In the later years of well-earned leisure enjoyed by George Stephenson, when the great engineer was devoting many hours to the task, long seeming impossible, but ultimately accomplished, of making cucumbers grow straight, no topic was ever more grateful to the inventor of the locomotive than that of the manner in which the provender for the iron horse had been stored up by the prehistoric agency of the sun. By encouraging that rich and copious vegetation which purified the atmosphere of our planet from a large amount of carbonic acid, or, at all events, of some volatile form of carbon, the sun was at work for millions of years in imprisoning in woody tissue that free energy which was accumulated, compressed, and stored in coal. The pick of the Northumbrian collier was the weapon by which that rich store of solar heat and light was rendered accessible to the toilers of the nineteenth century; and the stationary engines, of which Watt was the founder and first producer, no less than the locomotive engines perfected by Ericssen, Stephenson, Brunel, and their lieutenants, owed their life and play to the vegetation of the great carboniferous age.

Those of us who have seen with our own eyes the introduction and the improvement of the locomotive, are those who are most profoundly impressed with the immeasurable significance of the strides that have been made since that time in the study of dynamics. We do not so much refer to the development of mechanical improvement, as to the growth of the conception of the unity of force; for, great as mechanical progress has been in the last half-century, and increasing as is the daily rapidity of its development, it is evident that entirely new lines of advance are opened to the genius of man by the discovery of the master secret of mechanics. And the Faure battery, the efforts of Colonel Beaumont to utilise compressed air as a convenient motor,—indeed, the whole range of invention that deals with dynamo-electricity,—are but the first steps taken to reconnoitre and to survey this new province in the kingdom of Science.

It is impossible to give a more striking proof of the pregnant promise of the scientific discovery in question, than is afforded by the fact that one of the most brilliant of contemporary mechanists has been wiled away from the pursuit of mechanics to devote a portion of his time to the opening of a new chapter in horticulture, arboriculture, and agriculture. Let any one read the full text of the address of Dr. Siemens to the British Association, on electric energy, to which we have already referred, and we do not envy him if he fails to catch something of the noble enthusiasm of the speaker. We live fast in these days. Our views change with the change of circumstances. What was regarded as colossal eighty years ago is now only rather large. A millionnaire is not now a man who stands in the first rank of wealth. Thus for what may be needful to establish a scientific reputation of the first order we are becoming yearly more exorbitant. But we do not hesitate to say that if the results of a study of apparently some two years by Dr. Siemens could have been attained only a decade ago, they would have been regarded as an ample and most brilliant outcome of the labour of an entire lifetime of a scientific man.

On the 1st of March, 1880, Dr. Siemens communicated to the Royal Society a paper "On the Influence of Electric Light upon Vegetation." During the whole of last winter he has continued his experiments on the subject on a large scale. We must refer our readers to the address itself for details, but we are anxious to give some faint idea, in block, of what has been already ascertained. As for what may come of it in the future,—the prospect is too vast to take in at the first view. It almost seems as if that which has been the dream of

the lifetime of Liebig, the production of human food by the chemist, was about to be realised by the genius of the electrician. If we cannot yet directly combine inorganic elements into matter that can be assimilated by organised beings, it seems, at all events, likely that we shall be able immensely to stimulate the combining action of organic life itself.

The horticultural experiments of Dr. Siemens were directed to the end of ascertaining the effect of a powerful electric light on the growth of plants. They were carried on in a glass house of 2,318 cubic feet capacity, and in some sunk greenhouses, of which the capacity is not stated. The stimulatiog energy applied was luminiferous —not thermic,—and the heat desirable for the growth of the plants was obtained from the waste steam of the engine which drove the dynamo-motors of two electric lamps of about 5,000 candle-power each. The experiments were carried on for 197 days, from the 23rd of October, 1880, to the 7th of May, 1881. The nominal power of the steam-engine employed was 6-h.p. The consumption of coal was 56 lb per hour, which makes a cost (at 20s. per ton) at 3d. per hour per light of 5,000 candles. This cost, however, has to be reduced by the value of the heat afforded by the spare steam, so that the net cost of the light in cases where water-power or even wind-power is available, would be infinitesimally small. To that part of the case, however, we may have hereafter to revert. The actual effect of the light is matter of incomparably more interest than its present cost in money.

Dr. Siemens planted in the glass house peas, French beans, wheat, barley, oats, cauliflowers, strawberries, raspberries, peaches, tomatoes, vines, and a variety of flowering-plants. He maintained an even temperature of about 60° Fahr. His first experiments were unsuccessful, the tender leaves of the plants being, as it were, scorched by the fierce artificial light. Not baffled by a check which might have discouraged any but a born inventor, Dr. Siemens proceeded to make experiments on the virtue of different hues of light, by transmitting it through variously-coloured, as well as through clear, glass. To his infinite delight, we should conceive, he found that a screen of clear glass was all that was required. Whether the products of combustion in the electric arc affected the plants injuriously or not does not seem quite certain, but that radiating influence was the main agent the careful and ingenious experiments have left no doubt. That there are invisible actinic rays at the most refrangible end of the spectrum which are poisonous to plants, and that these rays are arrested or transformed by passing through clear glass, may thus be stated as the first positive discovery wrought out from the experiments. And as to the colours of light, the order of merit is,—white light, transmitted through clear glass, yellow, red, and blue. A vigorous growth was attained by the plants lighted through the first. They became feeble and more imperfect, in the order given, until those exposed to the unguarded light showed a stunted growth, and a very dark and partly shrivelled leaf.

The electric light was kept on from five p.m. to six a.m. every night except Sundays during the whole experiment. Strawberries ripened under it on the 14th of February, pears on the 16th of February, raspberries by the 11th of March, and vines bore ripe grapes on the 10th of March. The size, beauty, and flavour of the fruits are described as unusually good. A banana, set within two yards of one of the glass-protected lights, bore a bunch weighing 75 lb., each banana in the bunch being of unusual size, and the flavour being declared to be unsurpassed. Melons, remarkable for size and aromatic flavour, were also produced in the early spring. We are not reciting a fairy tale. Dr. Siemens has already given hostages to science enough to justify the public writer in accepting with implicit faith the precise statements of a report bearing his signature.

Subject to that reserve with which the results of any wholly new power must always be in the first instance received, it really seems as if the problem of artificial horticulture had been definitely solved by Dr. Siemens. And as to cost, it is positively ludicrous to speak of it. For there seems small reason to doubt that, at all events with annual vegetables, the crops of three or four years may be certainly raised, by the aid of the electric light, from soil that now, under the most favourable circumstances, can only give an average yearly harvest. And if we take one maximum harvest out of three years, the increased value of the soil to the cultivator is octupled or decupled. These seem large figures, but they are the simple outcome of the data before us.

The next thing that strikes our attention from these experiments is, that the sleep of plants is an accident of the constitution of our globe, and that, though innocuous, and consistent with all that goes on in our alternation of day and night, it is not a necessity of their nature. The entire absence in plants of a nervous system at all comparable to that of the members of the animal kingdom, is an argument that such nocturnal rest is unnecessary. Indeed, it seems from the experiments that a nightly growth does actually take place, but a growth of stem and leaf, at the expense of flower and fruit. How far the winter rest may be necessary, we do not think that the experiments as yet illustrate. We have, therefore, spoken of annual plants alone.

As to the cereals, which, of course, form the great *point-de-mire*, the experiments have as yet been unsuccessful. We venture to think, however, that the failure is due rather to a want of knowledge of the exact conditions favourable to the growth and ripening of wheat, barley, and oats, than to the failure of the electric light to anticipate the rays of the sun. A low temperature at certain stages of their development is probably a necessity for the healthy growth of these plants. In the Apulian plains, where the finest wheat we have ever seen is grown, frost, though not severe, is not unknown, and cold winds from the snow-capped Apennines are frequent. The great thing for the growth of the cereals is the timely sequence of cold and heat, of moisture and of drought. The cases are rare when these are supplied in their exactly required order and proportion by nature; hence the rarity of the best harvests, and the frequency of poor ones. But let the annual biography or rather phytography, of the corn-plant be once known, let the proper hygrometric, calorific, and luminiferous conditions for each succeeding stage of its growth be once fully ascertained, and we see no reason why corn should not be forced by electricity, aided in due time by icy or by sultry blasts, with perfect and certain success.

Dr. Siemens concluded his most valuable paper by suggestions as to the application of electricity to perform the hard work of a farm, to plough, to thrash, to pump. Into that we cannot now follow him. Not that these applications of the electric force are less interesting, but that the idea of the dynamic husbandry is more so. The field is so new, as well as so vast. And the interest which the invention should command is intensified at this moment by the condition of British agriculture. The harvest that was to make up for a series of bad years seems to be eluding the farmer daily. Only 8,875,702 acres of land in Great Britain were under corn crops in 1880, as compared with 9,675,261 acres in 1871. In Ireland there were 1,766,424 acres under corn in 1880, 2,124,079 in 1871. Potatoes show a like decline. And all green crops, including potatoes, in Ireland, sank from an acreage of 1,511,532 acres in 1871, to 1,247,359 acres in 1880. In Great Britain the green crops covered 3,738,180 acres in 1871; 3,476,653 in 1880. The crops have fallen off in a far more rapid proportion, the monthly sales returned by the Board of Trade having amounted to 12,731,751*l.* in 1871, and only to 6,381,684*l.* in 1880. We do not wish to travel outside the proper limits of these columns. But facts are not opinions, and when, on the one hand, we take such ugly and menacing facts from the statistical abstract of the United Kingdom, and, on the other hand, mark the result of experiments that promise to make two, if not three or four, ears of corn ripen with certitude where now one ripens with hazard,—we think we are justified in calling attention to the paper of Dr. Siemens on about the most interesting subject as to which any Englishman can allow his imagination to indulge its reveries.

The Birmingham and Midland Institute.—The new wing of the Birmingham and Midland Institute, which has been necessitated by the great increase of students both in the industrial and general departments, is now approaching completion, and will be formally opened on the 20th of October, when Dr. Siemens, the president, will deliver the inaugural address in the Town-hall. The total cost of the new block is about 30,000*l.*

THE NEW ALEXANDRA DOCK AT LIVERPOOL.

AN occasion not unworthy of the presence and sanction of their Royal Highnesses the Prince and Princess of Wales was the opening, on the 8th current, of new dock accommodation, amounting to 110 acres of water-space, and more than 6½ miles of quay-berthing, in Liverpool. For the description of the spectacle and of the festivities our readers must turn to the local papers; for Liverpool has her own daily as well as weekly press, and is not content with a corner in the London morning newspapers. But we cannot pass over either the great engineering features of the extended accommodation given to the traffic of the Mersey, or the brief but exhaustive summary of the progress of the commerce of Liverpool, which was given by the Prince of Wales in returning thanks for the toast to his health at the luncheon spread in one of the sheds of the new docks on the occasion.

At the commencement of the present century, said his Royal Highness, dues were paid in Liverpool on 650,000 tons of shipping; at the present time they are paid on between 7,800,000 and 7,900,000 tons, an increase of twelve-fold. In 1846, when his Royal Highness the Prince Consort visited the town, and opened the Albert Dock (called after his name), the docks for the business of the port of Liverpool were twenty-seven in number; they are now fifty-eight. In 1846 the area of water in the docks was 122 acres; it is now 543. In the former year the length of quayage was 9½ miles; it is now 40 miles. In 1846 the extent of the dock estate was 506 acres; it now amounts to 1,545 acres.

To these important figures thus put on record from the lips of the Prince of Wales, it may be well to add some details which will allow of comparison between the growth of Liverpool, as a port, and that of the general commerce of the United Kingdom. In the year 1800 (taking a proportion of a decennial return), the total tonnage of vessels employed in the foreign trade cleared outwards to all parts of the world, including Ireland, from the ports of Great Britain, was 175,000 tons. In 1846 the total tonnage of British and foreign vessels cleared from the ports of the United Kingdom was 6,314,571 tons. In 1880 the corresponding tonnage was 18,903,530 tons. Subject to any slight correction as to the value of Irish commerce, the advance of our mercantile activity, as measured by the tonnage of vessels clearing from our ports, has been thirty-sixfold between 1800 and 1846, and threefold between 1846 and 1880. As to the growth of Liverpool during the first period, it was prodigious, for it was starting almost from nothing. During the second period, in which our general commerce was multiplied by three, the number of docks in Liverpool has more than doubled (multiplied by 2·15); the area of water-surface has more than quadrupled (or multiplied by 4·45); the length of quay-walls has also quadrupled; and that powerful and important body, the Commissioners of the docks, have rather more than trebled the area of the extent of their property. Certainly Liverpool has kept well to the fore in providing for the increase of our commerce.

In 1873 the development of the steam navigation of the port of Liverpool was such as to call for more accommodation than then existed. Plans were prepared by Mr. Lyster, the engineer to the docks, and Parliamentary powers were obtained to borrow 4,100,000*l.* on security of the dock rates, with which capital the new works were paid for as they proceeded. The entrances of the new docks, containing, as before stated, 110 acres of water, had their sills laid at a level which allows the general class of vessels frequenting the Mersey to enter at any state of the tide. The docks are situated at Bootle, 3½ miles seaward of the Royal Exchange of Liverpool. The principal entrance is through the Canada basin, a sort of *avant-port* to the most northern docks, in which the tide ebbs and flows freely. This basin itself has been considerably enlarged and deepened to meet the new requirements, and its entrance from the river has been increased from 380 ft. to 400 ft. in width. Timber jetties are now in course of construction on each side of this entrance, projecting into the river. That on the north side, which is complete, is a remarkable work, called the Horn pier. The river wall curves sharply outwards, and terminates in a massive iron-clad bastion or pier-head of granite. From this the jetty returns for about 40 ft., ending in another pier-head of concrete, from which an

arm is thrown out to the new wall. On the north end of the Horn pier is a look-out tower, and an iron standard 80 ft. high, for the display of the electric light. The jetty is supported by strong uprights of green-heart timber, let into a granite base. The form of the wall is intended to break the force of the waves which rush up the Mersey in stormy weather.

There are two passages from the Canada basin, giving entrance to the new docks. The first of these is the Langton Dock, with a water-area of 18 acres, and 4,000 ft. ran of quay or berthing space. On the eastern side of these docks are two graving-docks, each of which can be so divided as to accommodate two vessels of large size. Pumping-machinery for emptying the graving-docks is erected on the quays between them, as well as hydraulic machines for opening and closing the dock-gates, bridges, and sluices, and for working the cranes. The pumping-engines, in two sets, of 420 horse-power, are by Messrs. Hull & Son, of Bolton. The hydraulic machinery is worked by a 350 horse-power engine, by Sir W. G. Armstrong & Co. Rooms to accommodate the foreman and enginemen are arranged in flats over the engine-house; and there is a clock-tower 120 ft. high, which contains the accumulators.

On the east side of the Langton Dock is a branch dock, with three acres of water area, and 2,000 ft. of quay. On the south quay of this dock will be an hydraulic 100-ton crane. On the north side of the Langton Dock two passages lead into the Alexandra Dock, named after Her Royal Highness the Princess of Wales, who opened the same on the 8th current. The Alexandra Dock has been expressly designed for the accommodation of steamers of the largest size. It is 1,600 ft. long from north to south, and on its eastern side are three branch docks, ranging from 1,100 ft. to 1,338 ft. in length, which extend inland to the main thoroughfares of the Regent-road. Altogether, the water area of the Alexandra Dock and its branches is forty-four acres, with nearly 12,000 lineal feet of berthing for ships.

The walls of the docks are built of cement concrete, faced with red sandstone of the neighbourhood, and coped with granite. The entrance walls are faced with granite. The steps and slips of the graving-docks are faced with granite. The dock-gates are made of greenheart timber; a wood of great specific gravity, and considered to be extremely durable. The berthing quays are provided with storehouses, from 80 ft. to 95 ft. wide, for the protection of cargo in transit; and there is direct communication by rail from these sheds to the termini of the several railways, as well as by road to the city itself.

For those who care for omens, it may be added that a fine carving of the Royal Arms of Great Britain before the union with Ireland has been lately discovered in the King's tobacco warehouses, near the docks, having been removed from an old building on the Dock estate. The stone has been re-erected as a memorial of the visit of their Royal Highnesses, and a floral border has been cut to surround the escutcheon, in which the shamrock has been inserted, and by which the plumes of the Prince of Wales are conspicuous. On a granite slab is cut the inscription, "These Arms of Great Britain, in the reign of George III., were removed from an old building on the Dock estate, and are erected here as a memorial of the auspicious visit of their Royal Highnesses the Prince and Princess of Wales on the occasion of the opening of these docks, September 8, 1881."

The presentation of a silver trowel on the occasion of laying a first stone has been long justified by the convenient service afterwards to be rendered by that implement as a fish-slice. The Liverpool Dock Commissioners seem to have drawn practical wisdom from their study of the Arabian Nights Entertainment, or some other fairy tales; for the handle of the lever by which the Prince of Wales set in motion the machinery for opening the great sea gates of the docks, turned, after its function was accomplished, into a hunting-knife, which was presented to the Prince; and the gold and jewelled knife with which Her Royal Highness severed the silken cord to allow of the opening of the Alexandra Dock, was, screwed into the handle of a parasol, presented to the Princess as a souvenir of the occasion.

The Eastbourne Sanitary Exhibition, we learn, has been successful even in a financial point of view. The expenses were 425*l.*, and there is a surplus of 40*l.* to the good.

FROM GERMANY.

Artistic Progress.—Professor Mohr, of Cologne, has lately exhibited in the museum of that city a gilded drinking-vessel designed by him, and executed in cast silver by H. Gladenbeck, of Berlin. The *Kölnische Zeitung* remarks that of late years there has been a general want of independent artistic invention, with regard to ornamental art, and notably as to vessels and ornaments of gold and silver. The writer of the article remarks that the goldsmiths of modern times seem to have lost that appreciation of the finer technicalities of their art, which was possessed by the workers of the sixteenth century, and calls attention to the numerous opportunities modern times afford artificers in precious metals for displaying their inventive genius, as to the forms which their productions should assume. These opportunities, it is urged, are neglected by the goldsmiths and silversmiths of the present day, who usually confine themselves to executing designs furnished to them by artists not members of their craft. The modern system of division of labour seems also, it is said, to be unfavourable to that unity of design so essential to good effect, and which is the secret of the renown achieved by such masters of their art as Benvenuto Cellini.

Professor Mohr has been occupied four years on this work, having met with many interruptions. Besides numerous ornaments and masked heads, there are fifty-six figures produced by casting and chiselling. The length of the part which contains the figures is 24 in. On one side the pleasures and griefs of love are shown, and on the other the different effects of wine: the former is quite a romance. A cavalier is serenading his lady love, and on the appearance of a jealous rival a duel ensues, in which the lover is victorious, and the final subject represents the happy pair on their way to the bymeneal altar. The surrounding foliage contains allegorical and other objects in harmony with the jewelled work displayed. The other side portrays a young vine-dresser in a vineyard, and the vessel of wine lying near is supposed to have brought before him a fantastic vision. In the following picture he has become a cellar-master, and in harmony with the previous revelations as to his bibulous disposition, he is seen carousing in company with a soldier and a student. The succeeding group contains a moral, as the Evil One is seen rising in a sheet of flame from a cask of wine and looking for a victim. Numerous other figures of a subsidiary nature are included in these well-executed groupings. The central point of the vessel is formed by a wreathed head of Silenus, with the motto *Ad multos annos* (For many years).

The lid is in harmony with the minor ornamentation of the body, and represents Tritons, Naïads, and dolphins in their native element. The handles are in a similar style. The upper part of the lid consists of an allegorical figure, on which the arms of Cologne are introduced. The lower part of the vessel rests on richly-executed figures as bearers.

The Preparation of Estimates.—One of the technical organs of the glass trade in Germany recently called attention to the above subject, with special reference to a resolution adopted early this year by the Glass Corporation of Dresden. The following was the resolution in question:—"In consequence of the numerous demands for estimates of an extensive character, some of which referred to cases in which the execution of the work had already been practically arranged for, it is resolved that, in cases where estimates are not followed by orders, an amount will be charged in proportion with the trouble incurred." In commenting on the advisability of this step, the article points out that those who have contracts to give out are often very thoughtless as to the great amount of pains taken by each person sending in an estimate. It is suggested that ½ to ½ per cent. on amount of estimate would be a fair charge in such cases.

The death is announced of Herr Moller, one of the leading members of the Berlin Architects' Association. Prior to the year 1868 he had held many important appointments under Government. In that year he was named director of the Royal Porcelain Factory. This post enabled him to display his architectural talent in the reconstruction of the building, and in the many improvements which followed. He was, apart from his professional career, a lover of art. His death (at the age of fifty-five) is all the more lamented by his friends from the fact of his having arranged to retire at the end of this year to enjoy a well-earned repose.

On August 28th the foundation-stone of an allegorical monument to the Knight of the Swan was laid at Cleves. A procession of historical personages took place, and the proceedings terminated with a ball.

The works at the Exhibition building, Hamburg, seem to have been unfortunate in the number of fatal accidents which have occurred there. A workman was killed a few days ago by falling from a height, this being the fifth death which has taken place from casualty during the construction. There are also at present five bad cases of injury in the hospital from the same quarter.

The Imperial Building Commission in Berlin has raised the question whether petroleum should not be used in place of gas, for lighting the grounds which it is intended to lay out behind the university, and also for that portion of the Kastanienwäldchen (or chestnut wood), in which it is proposed to make improvements. Some fears had been expressed that gas would have an injurious effect on the trees. The municipal authorities are in favour of gas being used, due precautions being taken to prevent the pipes from leaking.

The Minister of Public Works at Berlin has addressed an energetic circular to the railway companies under his control, pointing out the necessity of making every possible arrangements before the arrival of trains at intermediate stations, in order to save delays and to insure punctuality in their arrival at terminal points. Junctions are very numerous in many parts of Germany, and hence punctuality is doubly necessary for the convenience of the travelling public. In cases of necessity, particularly when the last train at night has been lost at a junction, the forwarding of passengers to some convenient point by special train is recommended.

ABATTOIRS FOR ST. PETERSBURG.

The new slaughterhouse for St. Petersburg, designed by the architect Kitner, will, it is expected, be opened for use next November. The main structure is already finished. The façade, situate in the Zabalkansky Prospect, is 129 sazhen (301 yards) in length, and the area covered by the whole erection is 20,382 square sazhen (110,968 square yards).

In the front plan are five blocks of buildings, of which one will be occupied by shambles or stalls for the sale of entire carcasses, and which will be leased to tradesmen. The remaining blocks will be taken up with the offices, the dwellings of the attendants, the inspector, and two veterinary surgeons, &c. This row of blocks is separated by a moderate-sized court-yard from the abattoirs themselves, which are situate in the back plan, and disposed in rows, with numerous passages for the entrance of cattle. The abattoir for large horned cattle consists of thirty-six separate compartments, each capable of holding twenty oxen. In each of these compartments a small space for the operation of slaughter is railed off with zinc-covered iron. Here there is placed a movable *cadette*, or platform, upon which the animal falls as it is killed, and which then carries the carcass out of the railed space and into the first compartment. Here it is lifted up by means of a special appliance, called a *tigalet*, and disembowelled, and then by a hook and pulley it is raised and suspended upon a movable circle of sufficient dimensions to hold twenty carcasses at a time. This circle, revolving upon circular rails, which depend from the ceiling, bears the carcass to the doors of the abattoir, where it is lowered upon a car. It should be added that the oxen awaiting slaughter are so placed that they are unable to see the operation of killing or the blood. It is proposed to collect the fresh blood as it flows away, in order to extract albumen from it, the right to do so being farmed out. We may mention here that the hot blood is much utilised at the Paris abattoir as baths for weaklings and sufferers from rachitis, &c.; while other invalids take it internally, and, it is said, with great benefit.

The abattoir for calves consists of ten numbers for holding thirty head each, and the scalding pens for swine five numbers, each for 100 head. On the right of the abattoir are constructed reserve sheds for holding about 320 head of oxen, while on the left, and separate from the rest of the edifice, is a shed comprising two pens to hold each twenty head of oxen. These are for diseased animals, which are to be killed and

burned. Here also the examination of any suspected droves is made by the veterinary officers attached to the establishment. All the offal from the abattoirs will flow into a large reservoir of peculiar construction, situated in the farther part of the ground-plan of the building, in the "machine section." From this reservoir the offal is withdrawn by a pumping apparatus, is strained through filters, and thence passes on direct to the sea through tubes laid down for this purpose for a length of 6 versts (3·978 miles). Both the reservoir and the tubes are made of Schmidt's Riga cement. It is proposed to cover the lower portion of the interior walls of the slaughter-house with slate; the substance of the inner walls themselves is the *béton* prepared by Devars, of Moscow. The total cost will be over 70,000*l.*

CONTINENTAL GATHERINGS.

SEVERAL exhibitions are now "in full blast," and in their respective countries appear to meet with satisfactory success. The Electrical Exhibition in Paris has proved completely successful, and its results will unquestionably do much to further the aims which it was the intention of its promoters to encourage. The English press has already supplied to our public much valuable information regarding the exhibition.

Of the Italian Exhibition, held at Milan, scarcely a word is, however, heard on this side of the Alps, notwithstanding its brilliant success, —a success which is encouraging after the Fine-Art Exhibition so recently held at Turin. It is rather, we learn, from an industrial than from an artistic point of view that it has proved a surprise to the Italians,—a surprise from the fact of the activity shown in Italy of branches of industry believed alone to exist and capable of development in other countries. From this point of view a sensible progress has been marked by the Milan Exhibition. The Italian Chambers have instituted an official inquiry on the Exhibition, and from its reports some interesting information is to be gathered. Italy, whose industrial activity has till now been considered, not alone by the world at large but by itself, to bear chiefly on artistic productions, in which old traditions, taste, and æsthetic sentiment have had more to do than the practical,—industries such as that of the silk-weaver, the glass-blower, the mosaic worker, the furniture producer, the wood-inlayer, and such like,—now has shown an ability to compete successfully in the manufacture of those more mechanical contrivances and aids to industry for which, till recently, they had to rely on foreign countries, and chiefly, let it be remarked, on England,—agricultural and other machines, carriage-building, iron and other metal founding,—while a rumour reaches us of a revival of the lost traditions of the brilliant industry of the bronze-caster. Young Italy, and especially Northern Italy,—more distinct in its character from Central, and certainly from Southern, Italy, than even the South and North of America,—is growing apace, and among the nations of Europe is rapidly obtaining its place; but happily for the romancist, the sentimentalist, and the artist, it will be long before the new spirit will be able entirely to drive out from the old peninsula the cherished memory of its Classic traditions.

Of other exhibitions at present being held on the Continent, that now opened at Lille is deserving notice. Devoted particularly to the fine arts, and international in its character, it certainly will not be from want of attractiveness if it do not prove successful. A selection of pictures from the Paris *Salon* forms not the least feature, while England, Belgium, and Germany have all largely contributed, and we learn from a French authority the English section has been particularly noticed as "remarkable." Opened on the 29th ult., by M. Turquet, the French Under-Secretary for the Fine Arts, the Lille Exhibition will not close till the end of October. A visit to the industrious Franco-Flemish town on the frontiers of France and Belgium will well repay the traveller, and a reference to the ever-handy pages of Murray will amply post him up in the curiosities of the town whence came the Lisle thread and the cotton yarn that has so long competed formidably with our English manufactures. For the artist, be he painter, architect, or sculptor, let not special attention be neglected to the more than interesting Wicar Museum, with its priceless artistic treasures, gathered together by an enthusiast in the days when knowledge enabled the collector in his visits to Italy and the Continent to constantly come upon rare and genuine "finds." Among the numerous works of the great masters of the sixteenth century, possessed by the rich collections of Lille, is a treasure particularly interesting to the architectural visitor. A book of sketches, by Michelangelo, containing more than 150 designs, studies from the works of Brunelleschi, Bramante, and architecture of the fourteenth, fifteenth, and sixteenth centuries, and from various Classic works, original compositions, &c. The catalogue of the Wicar Museum, and the tale it tells of the industrious and benevolent old collector, is alone worth the visit to Lille, apart from the pleasant and instructive recollections that every traveller cannot fail to bear away with him from the old town.

Under the somewhat alarming and sensational heading of "Vandalism," our Paris contemporary *L'Art* has, we see, opened for some time past a special column in its pages to note the acts of injury wreaked on those monuments and works of art which it is the duty of all art-lovers to protect. Under this rubric has recently appeared, — alongside of an attack on the "Vandalism" of painting, cockroach colour, we suppose it would by some be called, the façade of St. Philip in Regent-street,—a sad tale of the threatened destruction of one of the old bridges of Venice, the Ponte Panada on the Fondamenta Nuova, to be replaced by an *iron bridge*, the construction of which will, we learn, cost considerably more than 500*l*, a sum which certainly would be more than ample to solidly repair the old structure, one of those characteristic canal bridges which every visitor to Venice will remember, and said by competent authorities to be the last of its kind left in the city. The proposal has met with violent opposition on the part of a number of persons, but to no avail; the Commission which exists in Venice for the preservation of the public monuments of the city has in vain been appealed to by the *Circolo Artistico*. We should have imagined that so soon after the recent agitation against the threatened restoration of St. Mark's, such an incident as this would not have occurred. Happily the new structure will not resemble in importance the "ghastly iron bridge," as Mr. Ruskin has fitly termed it, which crosses the Grand Canal "at its noblest bend," and its hideousness will, to some extent, be hidden from the eyes of the stranger, who must be venturesome indeed who ever pushes his way so far from the neighbourhood of St. Mark's as the Fondamenta Nuova.

The new Post-office in Paris is, from all accounts, progressing with great rapidity. The *Événement* has recently published some interesting details concerning the erection of the Hôtel des Postes. On the side of the new Rue Étienne Marcel the building has reached the first story. The façade on this side is 140 mètres in length, divided into seventeen large bays, and flanked by pavilions; the façade on the Rue de Louvre has only nine bays. In erecting the immense structure much of the work is brought to the spot ready prepared, and placed in its final position by means of steam cranes. On the side of the Rue de Louvre the cellarage will shortly be completed; all the masonry is, in fact, terminated, the iron girders and joists on which the ground floor will rest remain alone now to be posed. In that portion of the new building on the Rue Étienne Marcel, the works are not in so forward a state, and on the Rue Jean Jacques Rousseau side the masonry has not yet been even commenced. However, by the end of October, it is confidently expected that the whole of the foundations will be above ground. As might be imagined, the value of land in the neighbourhood has singularly augmented; some plots selling for hard upon 120*l*. the square yard, others at a mean of some 1,900 francs (76*l*.); one plot, some 60 square yards in area, going at 204,000 francs, or about 135*l*. the square yard.

FULHAM INFIRMARY COMPETITION.

IN this competition twenty-six designs have been sent in at estimates ranging from 20,000*l* to 66,000*l*. At the first view of the drawings, on Tuesday last, by the Guardians, it was proposed and carried that a letter should be written to the President of the Institute of Architects, requesting him to name three architects,—Fellows of the Institute,—from whom the Guardians might select one to advise them.

APPROPRIATION OF WAGES AND OTHER SOURCES OF INCOME.

To Section F. (Economic Science and Statistics) of the British Association Meeting in York, Professor Leone Levi read a draft report drawn up by himself, and submitted to the committee, consisting of Professor Leone Levi, Mr. Stephen Bourne, Mr. Brittain, Dr. Hancock, Professor Jevons, and Mr. F. P. Fellows, for the purpose of inquiring into and reporting on the present appropriation of wages, and other sources of income, and considering how far it is consonant with the economic progress of the people of the United Kingdom. If it were possible, stated the report, to ascertain with any approach to accuracy the present appropriation of wages and other income of the people of the United Kingdom, it would certainly be of the greatest utility, as it would afford a valuable aid in the consideration of some of those great problems which meet us on every side in our social economy. There are, in truth, no means for ascertaining either the absolute income or the true expenditure of the entire population, and any calculation of the same must, more or less, partake of the nature of an estimate. It is the beauty and glory of what is termed the statistical method that it enables us to calculate the seemingly incalculable. With this instrument at hand, and with a good grip of the teaching of common experience, that which appears but a dream or guess to the uninitiated, becomes to the mathematician and statistician a simple, natural, and reliable result. Many attempts have been made to estimate the total income of the nation of late years. Mr. Gladstone, in one of his addresses, estimated it at 1,000,000,000*l*. The late Mr. Dudley Baxter, in his work on National Income, gave it at 813,000,000*l*. The writer made an estimate of the wages and earnings of the working classes in money or its equivalent, and found them to amount to 418,000,000*l*., and Mr. Giffen, in a paper read before the Statistical Society, estimated the recent accumulations of capital in the United Kingdom at the rate of 240,000,000*l*. per annum. After referring to the personal expenditure and the national expenditure for food and drink, dress, house, coal, gas, water, tobacco, education, literature, science and art, newspapers, church, theatres and music halls, other amusements, taxes, cost of distribution, as 878,000,000*l*. and 684,700 000*l*., he said these two sums give an average expenditure per day per head of 16·63d. as the personal, and 12·71d. as the real or national expenditure, or 25*l*. per annum in the one case, and 19*l*. in the other. Comparing these amounts with the personal and national income the results are as follow: — Income, 915,000,000*l*.; expenditure, 685,000,000*l*.; excess, 230,000,000*l*. The expenditure of the people might be classified into expenditure abroad and expenditure at home, expenditure in materials and expenditure in wages. Without attempting any further analysis, and having regard to the facts above stated, in connexion especially with what has been recently brought out by the census, of a continuously increasing population,—the effect of an increasing birth-rate and a decreasing death-rate,—we may conclude that the present appropriation of wages and other income cannot be said to be opposed to the economic progress of the people of the United Kingdom. A minute examination of the different items of expenditure is, indeed, calculated to remove the impression of any great extravagance on the part of the people as a whole. A large expenditure in bread, meat, woollen goods, and house-rent is a most economical expenditure. An expenditure of 124,000,000*l*. on alcoholic drinks is certainly very large, but reduced to the real expenditure the sum total is 42,000,000*l*. There is one element, however, which does not appear from this calculation, which might prove most unsatisfactory if properly inquired into, and it is that the averages arrived at are, in many cases, the mean of two extremes,—the extreme of waste and the extreme of penury; for side by side with those living in luxury and having no thought of waste, there are large numbers whose conditions of nourishment, state of dwelling-houses and clothing are of the lowest character. Nothing is gained by exagg-rated statements of the national loss arising from the wasteful consumption of this or that article, or by taking as a national loss that which is in effect nothing more than the transfer of money from one to another; but a proper regard to the right expenditure of money is of the highest importance

to the individual and to the nation, for waste and profligacy are the parents of pauperism, demoralisation, and declension. And no greater service can be rendered by the economist or philanthropist than by exhibiting the duty and importance of husbanding aright our resources, and making them conducive to the economic progress of the nation. The committee is fully aware that some of the deductions and reasonings in this report are not founded upon well-ascertained facts, nevertheless it deemed it useful to present them as materials for consideration, and as helps to the elucidation of a subject of the highest social and economic importance. The report points out many wants and desiderata, and the committee recommends the reappointment of a committee, consisting of a larger number of members, for the purpose of suggesting means for supplying the same on a uniform and scientific basis.

SUGGESTED REMEDIES FOR WAGES DISPUTES.

THE Rev. W. H. Jemison, LL.B., Vicar of Stillington, York, read the following paper before the Economic Science and Statistics Section of the British Association on "Remedies proposed for Wages Disputes": — The prevalence of disputes about wages, and the serious character of their consequences, have naturally made thoughtful persons anxious in pursuit of remedies whereby these disputes may be composed or prevented. A few of the best known and most effective of the remedies proposed are here considered. The first to be mentioned is the plan of arbitration, on which employers and workpeople refer the matter in dispute to one or more persons in whose judgment and impartiality they have confidence. Taking such a step is wise, and often productive of good results, but arbitration is at best a rough expedient. The value of labour, as of other things, cannot be correctly determined prior to experience, it being the actual result of several agencies. The arbitrator's decision is, in fact, only an approximation to the exact truth, which, in the absence of something better, it is prudent to accept. Again, the plan is strictly applicable only within certain limits. It may reasonably be declined where the parties are under no need or obligation with regard to each other, or where the principle of an engagement and all the facts of the case are already known. Neither employers nor employed are to be held bound to leave it to an umpire to say whether or not they are to agree to terms, which, in their opinion, would expose them to uncalled-for loss, nor whether stipulations of undoubted right are to be carried into effect. The former is a matter for free choice, and the latter for legal compulsion. These exceptions, however, leave a large mass of cases in which reference to an arbitrator is most natural and reasonable, and in every way better than continuing a dispute. In such cases the reference should be prompt, in order that the work of production may not be checked, and the work of loss begin. Even though the rate of wage arrived at by the arbitrator may not be the perfectly correct one, and his decision be rather a cutting of the knot than an untying of it, it is far wiser for the parties to agree to abide by such decision than to keep the dispute open. It is better to refer to arbitration even more cases than strictly belong to it than incur the likely consequences of dissension. Important as it is to settle disputes which have arisen, it is still more so to prevent their occurring. Boards of conciliation, which have been formed for this purpose, are really arbitration under a more settled form. These boards, which have been established in some trades, and have for a long time existed in France, consist of an equal number of representatives of employers and employed, who discuss among themselves the circumstances of the trade, and decide on what is best for the interests of the parties. Such boards are well calculated to promote a good understanding, and the maintenance of peace and industry. No doubt, in their operation, there is something like cutting the knot instead of nicely and perfectly untying it, but there seems no reason why the plan should not work with the best results. It only needs that the representatives on both sides be wisely chosen; that they deliberate with calmness and moderation; and that their decisions and counsels be loyally accepted by those for whom they act. It is sometimes found desirable for these boards to agree upon a sliding scale, according to which wages rise or fall with the selling price of the goods produced and the circumstances of the trade. The adoption of such an expedient diminishes the appearance of anything of a merely arbitrary or fitful character in the action of the boards, and makes wages become in a manner self-regulating. There must, however, be a proper rate of wage fixed on to start from, and a proper price of goods taken as the standard, and all the necessary conditions made clear. Though, even so, the best adjusted scale will occasionally need to be revised and recast. In these Boards of Conciliation, fairly and efficiently carried out, we have a valuable method of diminishing the number and acerbity of disputes about wages. Another method proposed for the prevention of these disputes is the adoption of the system of co-operation. This method attracts considerable attention, and has much to recommend it. It is claimed in its behalf, that though not really at work for much more than twenty years, it has already something like one-twentieth of the population associated on its principles. Under this system an attempt is made, not so much to adjust as to extinguish the opposing claims of employers and employed, by getting rid of the distinction between these two classes. To use the recent words of a noble expounder (Lord Derby) of the system, "It is like the settlement of an old family law-suit by the marriage of the litigants." A number of workpeople put their savings together or borrow capital; they procure the buildings, machinery, and materials necessary for carrying on a business; and they work together, each doing what he seems best fitted for and receiving wages for what he does. The co-operators are thus wholly or in part their own labourers and their own employers; and at certain periods they divide amongst themselves as gain the whole or part of whatever remains over after defraying necessary expenses. A distribution of results thus takes the place of a partition between wages and profit. By such means, it is claimed by the advocates of this co-operation movement, the occasion of the disputes so common under the old system is necessarily removed. It is hoped, too, that a higher tone may be introduced by it into business relations: work and labour rendered more honest through the general interest of all parties in the result; and indebtedness discouraged through the practice of dealing for ready money rather than on credit. The co-operative system tends also to educate the operative classes in principles of self-reliance and honest labour, and in an acquaintance with the difficulties which have to be encountered in the management of business. These various good tendencies entitle the movement to favourable consideration, and to any fair opportunity of developing itself and proving its fitness for general adoption. I contend, however, that that fitness is not yet proved. The plan of co-operation, though so available and beneficial under some circumstances, does not seem equally so under others. It may succeed, for instance, in cases where the several co-operators contribute equally to the results produced; or where the management of the business is comparatively simple, the sunk capital small, and the returns pretty regular. But in businesses which are different as to these several particulars, the general adoption and success of the system will be more unlikely. When, for instance, the workpeople contribute different kinds and quantities of labour or other aid, a difficulty must be likely to arise about apportioning to them their respective shares of remuneration. To make a really just and satisfactory apportionment would require a more general and accurate knowledge of the several elements of value,—both of labour and goods,—than any man can have before actual experience. Again, as to business management, it is no disparagement of the operative classes to say that they cannot be expected to have the qualities necessary for the management and direction of a large business,—qualities which are almost invariably the result of special training and experience. Of course these qualities might be hired at a commensurate remuneration, but there will still be a disadvantage in their exercise when compared with that in the case of an individual or firm ever on the look out for favourable opportunities, vigilant, enterprising, and speculative. There are obvious difficulties, too, in the way of members of the operative classes, or those only immediately above them, saving or borrowing sufficient sums to form the sunk capital of an enterprise of great extent; and also in their inability to bear the far-reaching consequences of a failure. The system seems to presuppose more extensive knowledge, more acquired mental power, and more self-control than the operative classes in any country can be expected to possess. It has often been observed that the co-operative principles succeed better in the business of distribution than in that of production; and the explanation of the diffesence is in what I have stated. Lord Derby, in opening the recent Co-operation Congress at Leeds, very fairly acknowledged the difficulty in the way of co-operation as applied to farming. He said, "The question arises,—have you got the men? Men accustomed to work,—willing to put themselves under orders, though they are their own masters, and intelligent enough not to be disheartened, and throw up the game if they are not lucky at the outset. If you can find men of that sort the experiment will probably answer; if you cannot it had better not be tried." These words must commend themselves to every one's good sense; but the difficulty which Lord Derby sees in the case of farming, together with other difficulties, is, I think, to be feared more or less in other branches of industry as well. Again, as there are many lawsuits which cannot possibly be settled "by the marriage of the litigants," so there are many social interests which may not really conflict, but they cannot possibly be amalgamated. To see what I refer to I would only ask the Section to reflect on the vast mass of productive interests at the present moment which are the result of that individual effort, for which no adequate place is found in the system of co-operation. Look at our great capitalists, our great business-managers, our industrial chiefs, who, by the dint of individual and personal fitness, take and hold their position of eminence in manufacturing and commercial life. I ask what place is there for such in the system of industrial co-operation? Or is it supposed that the rise of such chiefs will cease? I trust that we have no hopes of any such dead level. Combined effort, indeed, has its great field of achievement, as exhibited in our railways and various joint-stock undertaking; but it is only under certain conditions and within certain limits that it is superior to or even equal to individual effort; and even where combined effort is most successful, how often is its inception really the triumph of individual genius and perseverance. Again, there is a certainty, at all events, that the practice of accumulation will not be carried out by all persons in the same degree; for all have not the same will and ability. There will, therefore, be here and there among men various amounts of wealth, and the owners will often be persons who will prefer to employ their capital themselves independently, to throwing it into a common concern. In such cases, at least, the old distinction between employers and employed will necessarily survive. On the whole, then, it seems to me that although the co-operative system has much to recommend it, and if it were only for the high aims of many of its promoters, it ought to receive favourable consideration as an attempted solution of the wages-difficulty, yet that it is far from being universally applicable; and that we should be careful before we make up our minds to regard it as the ultimate form of industrial life. Another system, to which, in the last place, I shall refer, which has been proposed, and to some extent put in practice, for securing harmonious relations between employers and workpeople, is that known as the system of industrial partnership, or participation in profits. Under this system the workpeople are paid a certain wage, adjusted as nearly as possible to the condition of the labour-market, and there is given in addition a further sum proportioned to the success of business and the degree in which they have severally contributed to it. Instead, however, of considering this addition as a share of profits, it will be better to regard it as an increase of wage on account of more efficient labour; for nothing can conveniently be termed profit but the employer's share. This system, though not without its difficulties, has very considerable advantages to recommend it. It is favourable to production, for under it every workman has a direct stimulus to increased and careful exertion; it tends beneficially to the development in him of whatever may be his peculiar talents, and to the strengthening of the principles of emulation, self-reliance, and self-respect; his interest being so closely connected with his own character and conduct; and it also tends to conserve and pro-

mote good feeling between employers and employed, all having more or less an obvious and common and real interest in the success of the business. Besides, under this system, the direction of the business is left in the hands of those most competent to conduct it; the cost of production is lessened by the diminished need for superintendence; and, lastly, in the case of failure, an intolerable burden does not fall on the humbler workers, their loss being limited to an interruption of employment. The plan, as I have said, no doubt has its difficulties; difficulties as to the ascertaining of the fixed wage to be started from or adhered to; and the working of an efficient check and rule for measuring the claim of each workman to additional pay. In adjusting such claims regard must properly be had to the nature and circumstances of the business, including the amount and duration of the employer's outlay, some parts of which are of a stated character, as the amount of fixed capital which he had to provide, and others, as the cost of raw materials, varying from time to time. Account, in short, must be taken not so much of the general success, as of that portion of it which is due to the efficiency and diligence of the workpeople. The adoption, however, of a sliding scale, under which the increase of pay bore some constant relation to variations in the selling price of the goods produced, would perhaps be fair and satisfactory; for, in estimating the value of labour, we can scarcely disregard the value of its product. The several difficulties to which I have alluded will no doubt require attention; but they are, I feel, such as may be overcome in practice, and I believe are considerably overcome where the system is fairly in operation. Of course, under this system, should any question arise either as to the stated wage or the apportionment of extra pay, it can most properly and wisely be referred to arbitration. In expressing, for my own part, a decided preference for this system as the most hopeful, which preserves the natural distinction between employers and employed, leaving to the former the direction and management, and securing to the latter an interest in the results, I still would not be understood as desiring in the least to detract from the claims of any others. Various systems such as I have named will each and all find fields for development in our social life; and in so far as they have capabilities and fitness should all be encouraged by being allowed fair play. Natural powers and laws will work out their own results, and prove the best system paramount; but it is as difficult for us to predict and define the future form of social relations as to know the precise shape of the tree which is yet to spring from the acorn. What is especially to be desired in these matters is the prevalence of full and free competition, both for systems and individuals; human law taking care that none violate the rights of another; and moral and divine law being so honoured and influential that no persons will have the wish to do so.

Mr. Jeremiah Head, of the firm of Fox, Head, & Co., ironworkers, Middlesbrough, said he had some experience with regard to the question before them. About eighteen years ago some other gentlemen and himself established those works. After two years they found that they lost about a quarter of their total time in strikes, and in a fit of desperation they adopted a scheme, which had been advocated rather strongly by the author of the paper, called "industrial partnership." They adopted it for three years as an experiment, and as nothing particular occurred to induce them to make any change, they continued the system for other five years, and having experienced good times, it being from 1870 to 1874, they were enabled to distribute in the shape of a dividend to their workmen some 6,000*l*. He was sorry to say that at the end of five years they found that it was not to their interest to carry it on any longer. Many of their men became connected with trade-unionism, and as the unionists were adverse to the system that had been so successfully in operation, it came to an end, and there was now a Board of Arbitration and Conciliation, where the men and the masters are equally represented, and matters relating to their interests discussed and settled. It was, in other words, a place where a method of haggling went on, and the real thing that apparently regulated it was the state of trade at the time. He was satisfied, after much attention to the subject, that industrial partnership or industrial co-operation would never be successfully carried on, the men being unfitted for the commercial portion of the business to make it a success; but co-operation, in the form of co-operative stores, where they were their own customers, and were not obliged to seek customers in distant parts, was a system that had been successfully tried, and he could recommend it to the working population.

THE FORMATION OF COAL.

MR. EDWARD WETHERED, F.G.S., F.C.S., read a paper on the above-named subject, before the Geological Section of the British Association last week. The author first reviewed the researches of Hutten, Göeppert, MacCulloch, Sir James Hall, Sir W. Logan, and Dr. Dawson, and then summed up the conclusions now entertained as to the formation of coal, as follows:—1st. That the beds of fireclay which underlie all seams of coal, represent the original land-surfaces upon which the coal-forming vegetation grew. 2nd. That the stigmaria found in the underclays were the roots of that vegetation, which implies that the plants were of the Lepidodendroid order. 3rd. That the vegetation grew near the mouths of great rivers, in swampy ground, and there underwent submergence; changes then took place which converted the vegetable matter into coal. 4th. That the change of coal from one variety to another, even in the same seam, is the result of metamorphism, and is indirectly caused by the contortion of the surrounding strata, whereby facilities for the escape of gases evolved by the vegetable decomposition have been produced. The author's exceptions to the above were,—1st. That coal was not formed from vegetation of the Lepidodendroid type, and that therefore the stigmaria found in the underclays are not the roots of the vegetation which gave rise to the coal, unless it was from the spores of such plants, which the author considered wanting in proof, though seams of coal did undoubtedly contain spores. 2nd. That the varieties of coal and the change which sometimes takes place in one and the same seam are not due to metamorphism, nor are they dependent upon the contorted state of the surrounding strata, but arise from the greater or less chemical decomposition of the vegetable mass, influenced by the circumstances under which it was submerged. The reasons which had led up to these conclusions were:—1st. That we have proof of other vegetation during the coal-period besides the Lepidodendroids, but their roots have not been preserved, owing to their being of a more perishable nature than the stigmaria. 2nd. Beds of underclay are frequently met with full of stigmaria, but are not followed by seams of coal. 3rd. Coal must have been formed from a compact mass of vegetation, such as could not have been produced by large trees (as the Lepidodendroids were) growing *in situ*. The uniform thickness and comparative freedom from inorganic contamination would demand a mass of vegetation into which only a limited amount of sediment could penetrate. 4th. The finding of a fossil-tree standing *in situ*, upon which so much stress had been laid by some authors, is a rarity. Though the author had spent much time underground in collieries, and seen hundreds of fossil trees drifted into the position in which they have been found, he had only twice seen instances of them standing where they have grown. 5th. If seams of coal were formed from Lepidodendroid trees the tough base layer would be easily detected, which has never been the case in any true bed of coal. 6th. If the stigmaria found in the underclays represent the roots of the coal-forming vegetation, we should expect to find the fructifications immediately over the coal, which is not the case; with the exception of cordaites (which, in the author's opinion, was a reed), remains of fossil flora are not found for the first 2 ft. or so over the coal. After a careful investigation underground of the conditions under which coal was formed, the author has arrived at the following conclusions:—On the land grew the vegetation of the period, represented by lepidodendrons, sigillaria, calamites, &c. As the land sank and the waters encroached, the land vegetation gradually disappeared, but the roots remained in many cases, and those which offered the great resistance to decay are the ones preserved in a fossil state, hence the occurrence of stigmaria. As the waters advanced, the ground would become swampy, and then we might expect to see spring up reeds, mosses, and other vegetation suitable to the changed condition. It is to vegetation of this kind that the author ascribes the formation of coal. Reference was then made to the Presidential address of Professor Ramsey to the British Association in 1880, in which the recurrence of the same kind of incident through geological time was advocated. The author then asked, why the coal formations of the carboniferous period should be an exception, seeing that the modern lignites and deposits of peat were instances of coal in the progress of formation. It was then pointed out that these deposits were not composed of large trees, but of a lower order of plants. Coming to the varieties of coal and the change which sometimes takes place in this respect in one and the same seam, it was shown that the difference between bituminous and anthracite coal was that the latter contained a greater proportion of carbon and a less amount of volatile matter than the former. It was then contended that if the decomposition of the coal-forming vegetation took place without being affected, to any extent, by minerals capable of oxidising the carbon, a coal would be formed having a large proportion of carbon with a less proportion of volatile matter than is found in bituminous coal. The author explained this by briefly reviewing the process by which vegetable matter has been converted into coal. It chiefly depended upon the amount of oxygen which could unite with the carbon for carbonic acid, and the amount of hydrogen which could unite with the carbon to form marsh gas. By this process oxygen and hydrogen would pass off in greater proportion than the carbon, thus increasing the proportion of the latter to the whole. If, however, the submerging waters placed in contact with the vegetable mass substances capable of supplying oxygen to the carbon, then there would be a decrease in the proportion of the latter, and what the author termed "fixed oxygen and hydrogen" would increase in proportion to the whole, and give rise to a coal of a bituminous nature. With a view of ascertaining whether the chemical composition of the beds overlying a seam of coal which has changed from bituminous to anthracite also changed, the Welsh "9-ft." seam was selected, which, near Cardiff, is semi-bituminous, and at Aberdare becomes anthracitic. Specimens of the overlying strata were selected from the two districts at each foot above the coal for 5 ft.; these were analysed, and it was found that the beds from near Cardiff were considerably more argillaceous, and, as a whole, less ferruginous than those at Aberdare. It would be rash to attempt to determine the exact chemical nature of the sediment deposited over the coal-forming vegetation in the two localities, as, with the exception of silicate of alumina, the silicates and other minerals would have undergone decomposition at the expense of the carbonic acid given off from the coal-forming vegetation. There was, however, a decided change in the beds of the two sections presented, which could not be ascribed to metamorphism. It rather appeared to point to the sediment containing different constituents, which must have a very considerable effect on the vegetable mass. It was to this that the author was inclined to assign the change in the character of the coal.

A NEW FORM OF LIGHTNING CONDUCTOR.

BEFORE the British Association meeting at York, last week, a paper by Mr. Samuel Vyle, Associate of the Society of Telegraph Engineers, "On a new Form of Lightning Conductor," was taken as read, he being absent, with Mr. W. H. Preece, F.R.S.; Professor Adams, F.R.S.; Professor Symons, F.R.S., and other gentlemen interested in the subject, testing the lightning conductors on the Minster. The paper referred to the damage caused by recent thunderstorms, and pointed out that experience and the opinion of scientific authorities went to show that a lightning-conductor of sufficient capacity, when properly fixed, and having good contact with the earth, was a certain protection against lightning. The radius protected by each conductor was still a matter of controversy, but it appeared that a conic section equal to its height was within the bounds of safety. Referring to the repeated utterances of scientists as to the absolute necessity of testing lightning-conductors, in order to know their condition, the author indicated the difficulties that existed in getting these tests made, which were both costly and dangerous, a wire from the ground to the top of the conductor being necessary before the elec-

trician could commence; on lofty places and high spires this was conspicuous. Recognising this difficulty, last year Mr. Vyle was led to the invention of the new form of conductor which he exhibited. It was, in fact, a copper cable, with an insulated wire set within the core, which, being metallically connected to the conductor at the top, offered a ready means of testing it whenever desirable, the lower end of the inner wire being always within reach. Having, then, this testing-wire, it became necessary to provide the means of measuring its resistance, and this has been done by a differential galvanometer, fitted with three keys. The depression of two of them separately sends currents up the testing-wire to the top of the conductor, down which it passes to the earth, and also through an artificial circuit of resistance exactly equal to that of the wire and cable referred to. The indicating-needle is deflected to the side of the key depressed. If, however, both keys are pressed down at the same time, the needle will remain stationary or balanced, thereby proving the conductor good. In case the needle is deflected the third key is brought into use, and being depressed at the same time as the first proves whether the conductor is good, or the fault to be looked for above ground.

VISITS AND EXCURSIONS BY THE BRITISH ASSOCIATION.

THE Jubilee meeting of the British Association in York appears, as we have already said, to have been a very successful gathering. We have given reports and summaries of some of the addresses and papers read in the sectional meetings, but, besides the instruction provided for members and visitors indoors, visits to manufactories and public works, and excursions to places of antiquarian interest and natural beauty or picturesqueness, were organised in great number. We append a few notes of these visits.

York Gas Works.—At the York Gas Works, Monkgate, visitors were conducted by Mr. Charles Sellers, secretary, who explained the whole process of gas manufacture, and said his company used the same kind of Durham coal as was chiefly used by the London companies. They used lime exclusively for purification. The old lime is sold to agriculturists, it being an excellent fertiliser. The coke-breaking machine attracted considerable attention. By it coke is broken and screened, and made suitable for domestic purposes. It may be stated that York was first lighted by gas in 1823, and the present gas company was amongst the first in the country to sell gas at so cheap a rate as 2s. 6d. per 1,000 ft.

The Buckingham Works.—These works, the factory of Messrs. T. Cooke & Sons, the well-known astronomical and mathematical instrument makers, were also visited. The premises stand on Bishophill, on the site of the palace formerly belonging to the Dukes of Buckingham. These works were built twenty-five years ago by Thomas Cooke, originally a schoolmaster, whose mathematical talent earned him a wide reputation among men of science; and his memoir written by Colonel Strange for the Royal Astronomical Society of Great Britain is a fitting tribute to his genius. He died in November, 1868. A great portion of Messrs. Cooke's work is done for use abroad, instruments from these works having been used for the Indian Government Ordnance Survey, for measuring the Pyramids, and for many scientific experiments in other latitudes.

Central Saw Mill.—Apart from the work which is carried on in the Central Saw Mill, Newgate, the building itself is of some interest. It was erected on the ruins of a house of the same name. Previously to its destruction by fire, about seventeen years ago, the upper part of the building was of timber. The walls of the lower part mostly remain. The building is stated to have been of the fourteenth century, and had at the end, where the present doors are, an original archway, and there were two curious windows, one of which is yet to be seen. It has by some been thought to have been a prison for offenders within the precincts of the court, while others have held that it was a chapel. The "Vicars Choral," however, "had a house, said to stand over against the churchyard of St. Sampson, where they antiently lived to go there and kept hospitality in their common hall." But to whatever purposes or uses in ancient times this building has been devoted, it has for the past thirty years been in the occupation of Messrs. Charles Ernest & Co., who have carried on the manufacture of every description of drawer and door knobs or handles, also croquet, tennis, racquets, cricket bats, &c. The business of general turnery is carried on in these premises, and some of the machinery is interesting.

Ebor Works.—At the Ebor Works of Messrs. Varvill & Sons, North-street, the manufacture is extensively carried on of planes of every description for joiners, shipwrights, coach-builders, &c.; also all kinds of tool handles. The principal kinds of wood used are beech, box, ebony, and sycamore, all of which is bought in the round timber, sawn up, then steamed for twenty-four hours, after which it is cut up into stocks, and laid away for two years to season. Then it is worked up into tools. This firm also make plane irons of all sorts, and most of the processes may be seen in operation.

York New Waterworks.—Considerable improvements have lately been made at these works. It seems that in the year 1682, during the reign of Charles II., waterworks were first established in the Lendal Tower, adjoining Lendal Bridge. A pumping-engine, worked by two horses, was placed in the tower, by means of which a scanty supply of water was furnished to the citizens every week. The mains at that time were the trunks of trees hollowed out and fastened together, and laid down in the streets. This primitive state of things went on for nearly a century, when the works were purchased by Colonel Thornton, who made considerable improvements in the service of water. At his death the property came into the possession of his son, also a colonel, when a steam-engine was introduced, the building enlarged, and hot and cold water baths were provided in a house adjoining the tower, and these baths are still in existence. Colonel Thornton, in 1799, sold the waterworks, and the purchase-money was provided for by the issue of eighteen shares. The new proprietary effected other improvements. They raised the height of the tower, and made it 58 ft. 6 in. above the summer level of the river. The steam-engine was of eighteen horse-power, raised 16 gallons of water per stroke, the number of strokes being eighteen every minute. The water thus pumped was at the rate of 17,280 gallons per hour, or 207,360 per day of twelve hours. An extra pipe was placed to convey any surplus water into a tank beneath the tower, the floor of which was about 7 ft. below the bed of the river. At the beginning of the present century the population of York was rapidly increasing, and houses were multiplying in all directions in the suburbs, rendering it impossible for the company to overcome the difficulties with which they were beset, owing to the limited character of the resources at their command. A new company was accordingly formed in the year 1846, and the works of the old company were purchased under the authority of an Act of Parliament, which authorised the creation of a capital of 60,000*l.*, with borrowing powers to the extent of 20,000*l.* on mortgage. The new company secured a suitable site at Acomb Landing, adjoining the river, a few hundred yards higher up than Clifton Scope, and upon the spot was erected a commodious building, in which were placed two powerful steam-engines for the pumping of water from the river. Outside the building were provided two subsiding reservoirs and three filter-beds, as well as tanks, conduits, pipes, and other apparatus for raising the water from the river, and afterwards lifting it to the high service reservoir on Severus Hill, to be thence distributed through the city. The two steam-engines are each capable of working to about sixty horse-power. The filter-beds are constructed on a similar principle to those which were first suggested and put in operation by Mr. Simpson, at the Chelsea Water Works in 1828. Three of the filter-beds are 60 yards by 20 yards each, and one circular. The depth of the beds is 6 ft. from the face of the sand, and 5 ft. below for the filtering medium, which consists of 2 ft. 6 in. of fine river sand for the top layer, and the same depth of various sizes of gravel for the lower layer. Three of the beds are generally in use at one and the same time. About 62,500 gallons of water are filtered every hour. In 1876 such was the increased consumption and demand for water that the company obtained an Act of Parliament to extend their works, and new capital was created for the purpose. Recently a new engine-house, 42 ft. long, 21 ft. broad, and about 40 ft. high from the floor to the roof, has been erected, and also a boiler-house in connexion therewith, in the Tudor style, with a chimney 115 ft. high. It is supported at the base by buttresses at each angle, and the upper portion is octagonal in shape, and terminates with a battlemented coping. The whole of these buildings are of brick with stone dressings. In the new engine-house have been erected two powerful engines of 40-horse power each, and both are provided with a filter water-pump, and also a river water-pump, capable of raising from the river each 931,600 gallons per day of twelve hours, and sending the same amount of filtered water daily into the service reservoir on Severus-hill for the supply of the city. The two engines combined are therefore able to send 1,863,200 gallons of water per day for the use of the citizens, and this immense amount of water we understand could without any difficulty, in case of necessity, be increased to 2,000,000 gallons per diem. In addition to this, the old engines, which have done their work well so long, are still employed. In the new boiler-house have been erected four boilers, provided with smoke-burners.

York Glass Works.—The York Glass Works, Fishergate, are the oldest and most important in the district: medical bottles are the chief speciality, and these are shipped all over the world. The manufacture of bottles and other vessels of glass was not introduced into this country till 1557, and it did not make much progress till 1690, in the reign of William III. The art of glass-making was early practised in York. Drake, the historian of York, says that a "glass-house" was first erected in a lane near Margate; that the manufacture was continued for some time, but at length discontinued,—probably about the close of the seventeenth century. A local halfpenny was some years ago found, bearing the inscription "York Glass Manufactory." Part of the works of the York Glass Company, Limited, were erected in 1794. The business, although on a small scale, was a prosperous one; but it was not until 1864 that the present company was formed. The works have since then been considerably enlarged. Several warehouses and workshops have been built, and the furnaces altered and adapted to more modern principles and the latest improvements in glass manufacture. The works (according to the *York Herald*, from which journal we cull some of our particulars) are built on the site of the ancient priory of St. Andrews, Fishergate. The abbey was situated between Blue Bridge-lane and the present works, and the river Foss, and the high-road to Fulford. A portion of the Priory walls may still be seen in the boundary-wall in Blue Bridge-lane. The abbey or priory of St. Andrew was founded in 1202, by Hugh Murdoc, archbishop of York.

Railway Carriage Works.—A party of gentlemen were conducted over the carriage and wagon shops of the North-Eastern Railway Company by Mr. Elliot, the superintendent of the carriage department. The visitors were first conducted through the framing department, and were shown the machinery for mortising, tenoning, boring, &c., the several parts, all which machines, as may well be understood, are constructed with a view to the greatest possible economy of labour. The great strength of the framework of the under-carriages was a matter of curiosity and interest. A powerful mortising machine, by Messrs. Powis James, Western, & Co., of Lambeth, was the subject of a good deal of interest, on account of its great power and precision in cutting with easy application. The body and trimming and painting departments were next inspected, and this being done, the construction of the solid wheels was explained, and it was stated that a composite carriage was generally estimated to last about thirty years, the cost of construction being 400*l.* The smiths' shops next came under notice, and looked even more busy and animated than the carriage shops. The departments allotted to the manufacture of the company's lurreys, as well as the wagons for various descriptions of traffic, were shown in succession, and it was explained that the force employed were able to construct something like 100 wagons a week, and that 30,000 had been built during the last ten years. After a rapid inspection of the "hospitals," or repairing shops for carriages and wagons, the party were much interested by an inspection of the Westinghouse brake, an engine and carriage being coupled and put in motion to show its operation. The explanation, with a dissecting of the parts of the valves, &c., was a matter of considerable interest, and afforded a good deal of satisfaction to the visitors. After this Mr. Elliot conducted the party through the extensive

sheds for storing and drying the timber used in the construction of the various kinds of vehicles.

North-Eastern Railway Locomotive Works.—The Locomotive Department of the North-Eastern Railway was also visited, by permission of Mr. Stephenson, the superintendent. The department, which occupies a block of buildings at the end of Queen-street, near the old station, employs between 300 and 400 men, and though devoted chiefly to the repairing of locomotives, is provided with plant sufficient for their manufacture. The first place entered was the boiler-shop. The fitting-shops were next shown. After a survey of the varied work done here, the machine-shop, with its numerous and intricate machines for drilling, planing, cylinder-boring, &c., occupied considerable attention. The pattern-shop having been visited, the arrangement for fixing the tires of wheels was next examined. The smiths' shops were next viewed, and then the new buildings for fitting and erecting engines were arrived at. Thence the party proceeded to the goods warehouses in Leeman-road. Here a great saving of horse-flesh was noticed in the extensive use of hydraulic power. The large new engine-sheds were the last portions of the works visited. These sheds have standing-room for about sixty locomotives, a flue being placed over each stand, thus keeping the building clear of smoke.

Excursions.—On the 3rd inst. there was an excursion to Castle Howard, the seat of Mr. George Howard, M.P. Here the valuable collection of paintings and other works of art was inspected. The design of Castle Howard was by Sir John Vanbrugh, afterwards the architect of Blenheim House, Oxfordshire. The south front is 323 ft. in length, and consists of a centre and two wings. The centre has a pediment and entablature supported by fluted Corinthian pilasters, and is approached by a broad flight of steps. The north front has also a centre of the Coristhian order, with a cupola surmounting it, and two wings, the west one being the design of Sir James Robinson, and differing in style from that on the east. Helmsley, Duncombe Park, and Rievaulx Abbey were also visited on the same day. Permission had been obtained to drive through Duncombe Park, which is well belted by trees and stocked with deer and shorthorns, and from which most extensive and varied views of the country can be obtained. As the ruins of the Hall were inspected, there was a general feeling of regret that so fine a building with its art treasures should have fallen a prey to the disastrous fire which occurred three years ago. This structure was in the Doric style of architecture, and was the design of Sir John Vanbrugh. The rebuilding of it will shortly be recommenced. Rievaulx Abbey was described by the Rev. C. N. Gray, vicar of Helmsley. There were also excursions to Scarborough, Harrogate, Brimham Rocks, and other places of interest. In spite of the very wet weather, which mostly prevailed, each of the excursions attracted two or three hundred ladies and gentlemen, who, from the published accounts, seem to have successfully emulated Mark Tapley in being jolly under difficulties.

THE SOUTH HORNSEY LOCAL BOARD'S NEW OFFICES.

THERE are few suburban localities around London which are increasing at the same rate of progress as the neighbourhood of South Hornsey. The district under the management and control of the South Hornsey Local Board covers a very large area, stretching something like two miles from south to north, and from Stoke Newington to Finsbury Park between east and west. Within this extensive area several hundreds of houses have been erected within the last two or three years, many of them of the villa character, and at the present time building is still going forward in the district on a very large scale.

The continued expansion of the neighbourhood has induced the Local Board to erect new public offices, and the buildings have been in progress during the past three or four months. The site of the offices is in Milton-road, not far from the centre of the Board's district. Although the structure is already considerably advanced, the formal ceremony of laying the memorial-stone has only taken place during the present week, the Chairman of the Board having performed that office on Thursday afternoon, in the presence of the members of the Board, and about 200 invited guests. The building, which is in the modern Classic style of architecture, and in Portland stone, has an elevation to Milton-road 70 ft. in length, and 40 ft. in height, containing the ground-floor and a lofty story above, with dormers in the roof. The ground-floor portion of the elevation has ornamental pilasters with Ionic capitals, the floor above also being faced with similar pilasters and composite capitals. Each floor contains a range of arched windows, those on the story above the ground-floor being eight in number. Above the ground-floor there is a projecting cornice, and the elevation is surmounted by a balustrated parapet. A central porch, 12 ft. wide by 5 ft. deep, with an arched door and gateway, leads into an entrance-hall, 20 ft. by 12 ft., the walls of the entrance-hall having pilasters, and the floor is laid with encaustic tiles. The ground-floor contains, on the right and left of the entrance-hall, the clerk's and the surveyor's offices respectively, together with the inspector's office, the general offices, and strong-room. A staircase, 17 ft. wide, in Portland stone, with an ornamental balustrade, leads to the board-room on the upper floor. This apartment is 43 ft. by 23 ft., and is 17 ft. in height to the ceiling, which is coved and panelled, and has three sun-burners. The walls are enriched by twelve columns. Adjacent to the board-room are two large committee-rooms, together with waiting-rooms and lavatories. A portion of the building is intended to be finished and fitted as the residence of the board's surveyor.

In addition to the new office buildings as above described, a separate building close adjoining is to be erected as the fire-engine station. This building will likewise have its frontage to Milton-road, the elevation being in Portland stone, and though plainer in character, uniform to some extent with the new offices. In addition to the standing space for the fire-engines, the building will contain the fire brigade superintendent's apartments, whilst at the rear will be the stables and yard. The buildings also include a mortuary for the purposes of the district, which will be erected at the east side of the fire brigade stables. The whole of the buildings and grounds when completed will cover an area of 140 ft. in length and 96 ft. in depth.

Mr. E. Fry is the architect of the buildings, and Mr. S. Goodhall, of Stoke Newington, the contractor, Mr. W. R. Smith being foreman of the works. The cost of the buildings will be about 9,000*l.*

THE NEW PEABODY BUILDINGS.

SOME of the largest blocks of buildings which have yet been erected by the Peabody trustees are at present in progress in different parts of the metropolis. One of the most important of the blocks is that which is now being erected on the spacious plot of ground situated between Drury-lane and Great Wild-street. These buildings, which are now far advanced towards completion, consist of thirteen distinct structures in four main blocks, one facing Drury-lane, one in Kemble-street, a third facing Great Wild-street, where will be the principal entrance, and the fourth block stands within the ground. The buildings contain in all 819 rooms, forming 312 tenements of two or more apartments each, in addition to 175 single rooms. The buildings are six stories in height, and, like all the rest of the erections of the trustees, are in white brick. Four blocks, containing 280 rooms, are also nearly ready for occupation in Bedfordbury; whilst fifteen large buildings of a similar character are in course of erection on the Pye-street site. In addition, operations have just been commenced on the Whitecross-street site, and also on the site in Westminster, in the rear of the south side of Victoria-street. The Westminster site is between one and two acres in extent, and the blocks about to be erected upon it will be amongst the most extensive of the buildings belonging to the trustees. Ten blocks, comprising altogether 610 rooms, have been opened during the present year in Glasshouse-street, and the trustees state that before the close of the year they expect to have provided in addition to their tenements already occupied, accommodation for 760 families, or upwards of 3,500 individuals. The average rent of the Peabody Buildings all over London was estimated at the close of last year to be 4*s.* 4½*d.* per week for each dwelling, or at the rate 1*s.* 11½*d.* per room. Messrs. Cubitt & Co. are the contractors for the whole of the several blocks now in course of erection, under the direction of the trustees' architect.

MAIDS MORTON CHURCH.

BUCKINGHAMSHIRE is by no means a rich county for the ecclesiologist, and it is somewhat singular that in such a purely agricultural district the towns should be so remarkably uninteresting, and the churches should have fared so badly. Yet, somehow or other, the important towns in Buckinghamshire seem to have been deprived of their ancient churches about a century or so back, and for what reason it is impossible to say. Buckingham has lost its ancient church, and in its place we find a strange building, consisting of a Batty Langley tower and spire, a slice of a "Georgian" nave, and the residue Revived Gothic. At Stony Stratford we find a solitary old tower and a Brummagem Gothic church, which we have been told is to be rebuilt. It is true Stewkeley, Hillesdon, Stoke-Golding, Chetwode, Langley, Burnham, Eton College Chapel, and Olney spire serve, to a certain extent, to prevent our saying that there are no churches worth seeing in the county, and we will add to the list Maids Morton Church. This remarkably pretty little church is situated just one mile from the singularly uninteresting town of Buckingham,—the *beau ideal* of a thoroughly dull English town, with its ugly church, ugly town-hall, innumerable inns (there appears to be a drinking-shop of some kind or other to every four or five dwelling-houses). We see also the dull-looking shops with their stale fly-blown goods; the awfully respectable houses of the aristocracy of the place, and the "genteel villas" of the retired tradesmen, &c. A Continental town of the size would have its theatre, its *café*, its pleasure-garden, its concert-rooms, its band of music, its museum, and probably its picture-gallery; but in our English country towns there is absolutely no amusement provided for the people, and hence the innumerable public-houses.

Maids Morton Church is dedicated to St. Peter, and, although only a small building consisting of a single nave and chancel, small sacristy or vestry, a west tower and two porches, yet exhibits many features which are not commonly to be met with in village churches. Lysons gives the date of its erection at "about the year 1450." We confess we should be inclined to suggest a later date, judging from some of the detail. It is said to have been erected by two maiden ladies, daughters of the last Lord Peyvre, and there is much in the appearance of the building to favour this idea. No ordinary village church would have been constructed with the care and skill bestowed upon Maids Morton. The whole building, both within and without, is of ashlar, very neatly jointed, and laid in quite regular courses. The roofs of the nave and chancel are of oak, excellently carved and richly moulded. The porches, tower, and sacristy are vaulted in stone, with fan tracery. There is a good rood-screen, and a Norman font, ornamented with a kind of decoration resembling the expanded leaves of the sun-flower. There is a little stained glass, a Jacobean squire's pew, and a Communion-table of Charles II.'s period. The most beautiful object, however, in the church, is the remarkable sedilia, with rich projecting canopies, and an old painting of the Last Supper, extending across the back of the niches.

There are, however, one or two features about this building to which we would call special attention. They are, in the first place, the very original treatment of the belfry story of the tower. Contrary to the usual practice in England, the splay of the windows is external, and the great mullion in the centre is nearly the depth of the wall. The cusping of the enclosing arch is also rather uncommon.

The second feature which deserves attention is the very remarkable canopy over the western doorway, forming a kind of hood or hanging porch. Its design and treatment will be better understood from the sketch we give of it than from any amount of description.

The vaultings of the two porches and the sacristy also deserve special notice. They are remarkably elaborate examples of fan-tracery, and bear a strong resemblance to the vaulting of the two chantry chapels on either side of the choir of St. George's, Windsor. It is somewhat remarkable to find such work in a village church, and for this reason we are led to the conclusion which we have already alluded to, that Maids Morton Church may be looked upon rather as a "votive" church than as a parochial or village church.

The whole floor was originally composed of encaustic tiles, many of which remain. The monuments are not interesting. The stone which covers the grave of the two sisters who erected this beautiful building is situated in the middle of the nave; it formerly bore the brass effigies of two females, but these have disappeared.

It is stated that, within the memory of some now living in the village, every window of this most interesting church was full of stained glass, and the nave seated with carved oak benches; very little old glass, however, now remains, and the oak benches have given place to wretched deal pews!

NEW STABLING AND OUT-BUILDINGS, "THE LODGE," WALMER, KENT.

THESE buildings have been erected for Mr. Alex. Tod, from the designs, and under the personal superintendence of Mr. James Neale, F.S.A., of Bloomsbury-square, London. The main block comprises loose-boxes and stables for five horses, large coach-house, harness-room, five living-rooms and water-closet for the coachman, cistern, and box-rooms. Care has been taken that no living-rooms should be over or in any way connected with the stables. Separate accommodation is provided for the groom on the ground floor. There are lofts over the stables. The *flèche* is for ventilation, which is carried out on the Tobin system.

The out-buildings comprise cow-house, dairy, fowl-house, coals, wash-house, piggeries, earth-closets, &c. Special arrangements have been made for feeding the cows, and for taking the eggs from the hens' nests without disturbing the fowls. There is a loft over the cow-house, and also a loft over the fowl-house used for pigeons; the *flèche* shown on the drawing is the exit of the pigeon-house.

The walls, which are built hollow, are faced with Kentish rag, with ganged red brick quoins, sills, and dressings. The rag is hammer-dressed and laid in thin courses, varying from 2½ in. to 4 in. in thickness; the courses are brought to a horizontal bed at every 18 in. This means of laying the rag is similar to that used in some of the old churches in Kent. It has a quiet pleasing effect, and gives proportion to the buildings. The rag was prepared at the quarries of Messrs. Benstead & Son, at Maidstone.

The external timber work is painted a cream white, and the panels are pebble-dashed with small pebbles obtained from the beach.

The roofs are covered with the rich red tiles manufactured by Messrs. S. & E. Collier, of Reading. The hip-and-valley tiles have been purposely made from the architect's drawings to work with the tile courses. There are also purpose-made angular hanging tiles which overlap the angles of the dormers and prevent the wet driving in between the wood frames and the side tile hanging.

The facing bricks used are of a dark red colour, made by Mr. Charles Richardson, at Teynham. All the bricks have been rubbed. The moulded brickwork shown on the drawing is cut, rubbed, and set in putty.

The stables are fitted with all the modern appliances by the St. Pancras Ironwork Company. The wood is of pitch-pine. The space above the mangers is lined with delicate green tiles, and above is a frieze of salmon-tinted stamped plaster.

The stable yard is laid with blue brick, manufactured by the Kent Brick and Tile Company, at Pluckley.

There was no contract, with the exception of the stable-fittings, and, therefore, no temptation for "sea-side jerry building."

Mr. Redman, the clerk of works, engaged labour and material. Amongst the other trades not already mentioned were Messrs. Frost Bros., of Deal, for gas, water, and general plumbing; Mr. Steriker Finnis, of Dover, timber; Messrs. White Bros., London, cement; Messrs. Crease & Son, London, colours, &c.; Messrs. T. Potter & Sons, London, ironwork, gates, &c. Mr. William Webb acted as foreman; and Mr. Thos. Pulling undertook the painting and decorative work.

The stabling is well situated close by the sea, and surrounded by fine trees. There is to be telephonic communication between the stables and the house. The house, of which we may speak hereafter, is about 200 yards distant. It is now drawing to completion, having been enlarged at considerable expense from the designs of Mr. Neale.

PORTAL OF THE CHURCH OF SANTA MARIA, BELEM.

ABOUT two miles and a half from Lisbon, on the right bank and towards the mouth of the river Tagus, there existed during the middle ages a place called Restello, opposite the first and safest anchorage-ground for vessels after passing the bar of the port, being nearest to that for vessels preparing to leave for the Atlantic. On this spot the Infante Dom Enrique founded a small hermitage, and gave it to the Jesuits, of which body he was the administrator-general, with a view of rendering temporal and spiritual aid to mariners. Vasco de Gama, before starting on his momentous voyage of discovery to the East Indies, on July 8, 1497, is said to have offered up his humble supplications at the chapel attached to the hermitage, and again on returning, two years later, in September, 1499, to have rendered similar homage. This happened during the reign of Dom Manuel I. (1495—1521), surnamed the Fortunate, who determined to erect on the site of the hermitage a magnificent church in commemoration of the splendid achievements of the circumnavigator. This is the origin of the church of "Nossa Senhora de Restello," and the adjoining convent, in the vaults of which repose the remains of several kings of Portugal. The edifice, of the portal of which we give a view in this week's *Builder*, is a combination of the Ogive and "Plateresque" styles, and is one of the most elaborately adorned churches of Portugal. Its sculpture, both mural and statuary, is of the highest finish. The church contains a statue of its founder; a figure of the Virgin Mary, placed under a rich canopy; another of St. Michael the Archangel; and numerous saints in niches, also protected by canopies of filigree tracery.

There are comparatively few remains in Portugal of Mediæval architecture. The group at Belem, to some members of which we have before referred, is an important portion of them.

MEMORIAL CHURCH AT ST. PETERSBURG.

SIR,—We have received at the Royal Institute of British Architects, from the Foreign Office, by the courtesy of Earl Granville, a copy of the plan showing the site of the Memorial Church proposed to be erected at St. Petersburg to the memory of the late Emperor. As the Institute is now closed, and as the next number of our Journal of Proceedings will not appear until the middle of October, we shall esteem it a favour if you will publish a photo-lithograph of the plan, herewith enclosed, in an early number of the *Builder*. We venture to suggest that the conditions of this International competition, which were published by us on the 28th of July, should also be inserted, in order to explain the plan, especially as they have not yet been printed in your valuable journal.

J. MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE, Secretary.

GEO. GODWIN, Esq.

We willingly publish the plan as requested, and we append the conditions as translated:—

"Extract from the *Journal de St. Pétersbourg*, May 28 (June 9), 1881.

In pursuance of a resolution passed by the Municipal Council of St. Petersburg to erect a stone Church, dedicated to the Russian Orthodox Ritual, and to be sacred to the memory of H.M. the late Emperor Alexander II., a competition is opened for the design of this edifice under the following conditions, viz.:—

1. The design must be so arranged that the church has three altars, the spot where H.M. the late emperor fell mortally wounded (shown on the plan by a cross) may stand in the centre or at the right angle of the western part of the church. This spot may be considered and treated as constituting the object of an annexed part of the edifice, though it must, nevertheless, form one and the same connected design of the church as a whole.

*** The foundation line of the west elevation of the church must not advance into the bed of the canal to an extent exceeding 7 ft., as indicated by the line *a b* on the plan, but the steps of the *parvis* of the church may be placed upon the bridge.

2. The basement is not intended to be applied to any purpose other than to provide room for the heating and ventilating apparatus and the storage of fuel.

3. The church must be designed to hold a congregation of 1,000 persons, upon the principle of allowing 7 ft. square to every sixteen persons.*

4. The position of the tower or that part of the building which is to contain the bells is left to the choice of the competitors.

* The number of sixteen persons per square *sagène* (7 ft. by 7 ft.) is fixed, because the Russian Orthodox Ritual does not admit of the worshippers being accommodated with seats during Divine service.

5. Competitors are also required to submit designs for the ornamentation of the bridge, which is to cover part of the canal so as to form a square in front of the church; and of the ornamentation of the part of the Palais Michel which will surround it.

6. The designs must include:—(*a*) Detailed plan of the church, two elevations, one a lateral one, and the other facing the park, and also a section; these drawings to be prepared to a scale of 1 in. (English) to the sagène (7 ft.). (*b*.) The west elevation and another section must be drawn to a scale of 2 in. (English) to the sagène. (*c*.) A general plan, on a scale of 1 in. to 5 sagènes. (*d*.) A perspective view of the church with its approaches. (*e*.) An explanatory memorandum stating, amongst other details, the cubic capacity of the church, computed in sagènes, and describing the nature of the materials to be used in the construction.

*** Competitors may elaborate the details of the building as they may deem fit.

7. Russian and foreign artists are both eligible to take part in this competition.

8. The designs must be submitted at the office of the Municipal Council of St. Petersburg at the latest on the 31st of December, 1881 (12th of January, 1882), at noon.

*** The general plan of the site whereon the church is to be erected may be had on application, either to the *Gérant* of the Town-hall of St. Petersburg, or to the offices of the newspapers in which the present notice appears.

9. For four designs sent in by the appointed time, which fulfil the conditions laid down in the present programme, and are allowed by the jury to be the best in order of merit, the Municipal Council will grant four premiums. For the first in order of merit, 2,500 roubles; for the second, 2,000 roubles; for the third, 1,500 roubles; for the fourth, 1,000 roubles.

10. All designs must be sent in in a portfolio, and not rolled up in a case.

11. Every sheet of the drawings, as well as the explanatory memorandum, must bear a motto chosen by the author of the design. The names, rank, and address, of each competitor, must be supplied in a sealed letter, bearing the author's motto on the cover.

12. All the designs sent in will be exhibited to the public during eight days in the town-hall. After the decision of the jury the successful designs alone will be exhibited again in public.

13. The jury undertake to publish a short memorandum setting forth succinctly the merits and defects of all the designs presented. The names of the premiated competitors will be published in the journals in which the present notice now appears.

14. The prize designs will become the property of the Municipal Council of St. Petersburg. The designs not selected for the prizes will be returned, together with the respective letters unopened, upon presentation of the receipts originally given by the *Gérant* of the Town Hall.

15. Members of the jury are debarred from participation, direct or indirect, in the present competition.

16. The premiums awarded will not entitle the successful competitors to take part in the construction of the church. The committee appointed by the Town Council reserve to themselves the selection of the architect to be entrusted with the execution of the works.

17. The jury consist of the following Members of the Council of the Imperial Academy of Fine Arts, viz.:—Professors A. Rézanow, D. Grimm, A. Krakas, and W. Schreiber; of the following Members of the St. Petersburg Society of Architects, viz.:—Professors R. Bernhardt and E. Gibert; and of the Mayor of the city, as well as of four delegates appointed by the Municipal Council."

References.

✠ The place where the Emperor was mortally wounded occurs at "1. arch. 4 *w*." of the line of the quay.

a. B. Limit of the foundations of the church.

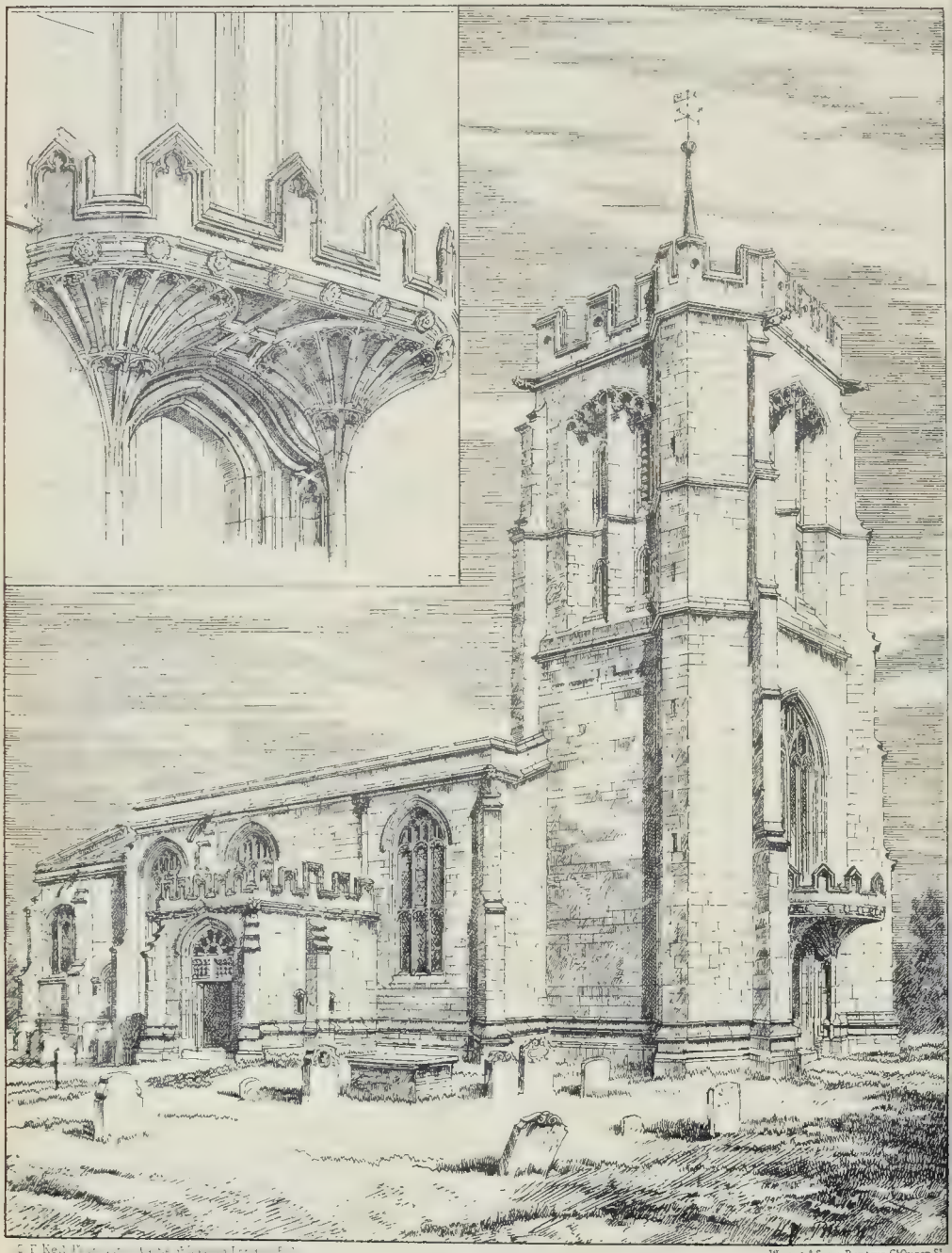
The lines *c d e f g h i*, or *c d' e' f' g' h' i*, mark nearly the limits of the site intended for the church and the parts of the quay adjacent.

GAS AND WATER COMPANIES AND THE ROADS.

MR. JAS. LOVEGROVE, C.E., in his report to the Board of Works for the Hackney District as chief surveyor to the Board, says:—"The gas and water companies have made during the year, 1881, about 3,700 openings in the gravel and macadam foot and carriageways, and the total amount charged to them is 953*l.* 3*s.* 10*d.* The present system of breaking open the paths and roads for the purpose of cutting off water in cases of non-payment of water-rate, and after the lapse of a few weeks to re-open again for the purpose of laying on the water, is very unsatisfactory, and is one cause of constant disturbance of the highways. The system adopted by gas companies of cutting off inside the premises, clear of the highways, should be adopted also by the water companies. The highways are constantly being opened by the water companies because of the present objectionable system."

If some of the other Board surveyors will give similar statistics the damage done under the present system will become so apparent that a charge will be insisted on.

The Liverpool Autumn Exhibition of Pictures, now open, appears to be one of exceptional interest. Works by Briton Rivière, Sir John Gilbert, Yeames, Wells, Holman Hunt, and Alma-Tadema are included. A large picture by Mr. D. G. Rossetti, entitled "Dante's Dream," has been purchased out of the exhibition by the Corporation, and will be added to the local permanent collection.



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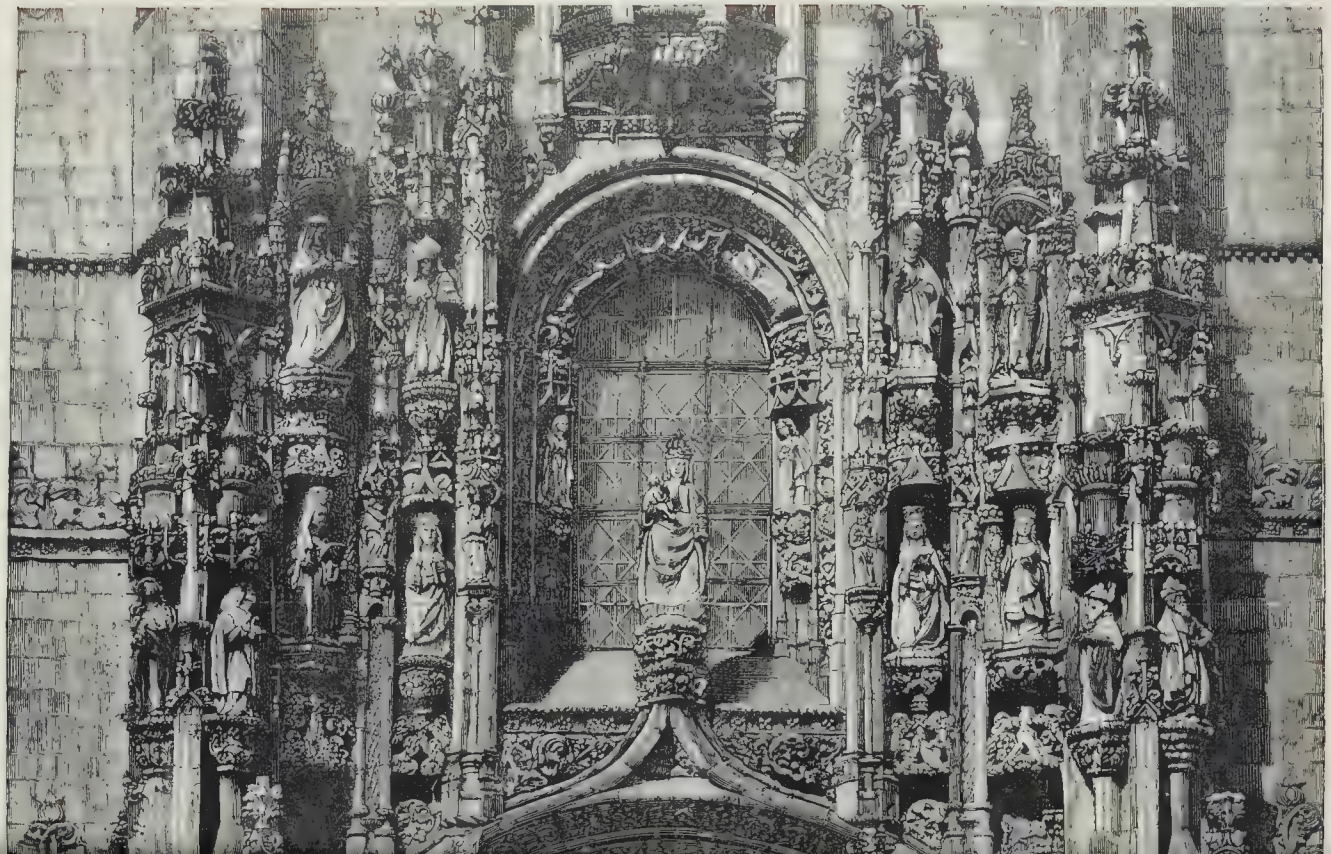
ST. PETER'S, MAIDS MORTON, BUCKINGHAMSHIRE.—*Fifteenth Century.*



C[illegible] 4[illegible] Bath Castle St Holborn E.C.

Wyman & Sons Printers Queen St

OUT-BUILDINGS, "THE LODGE," WALMER, KENT.





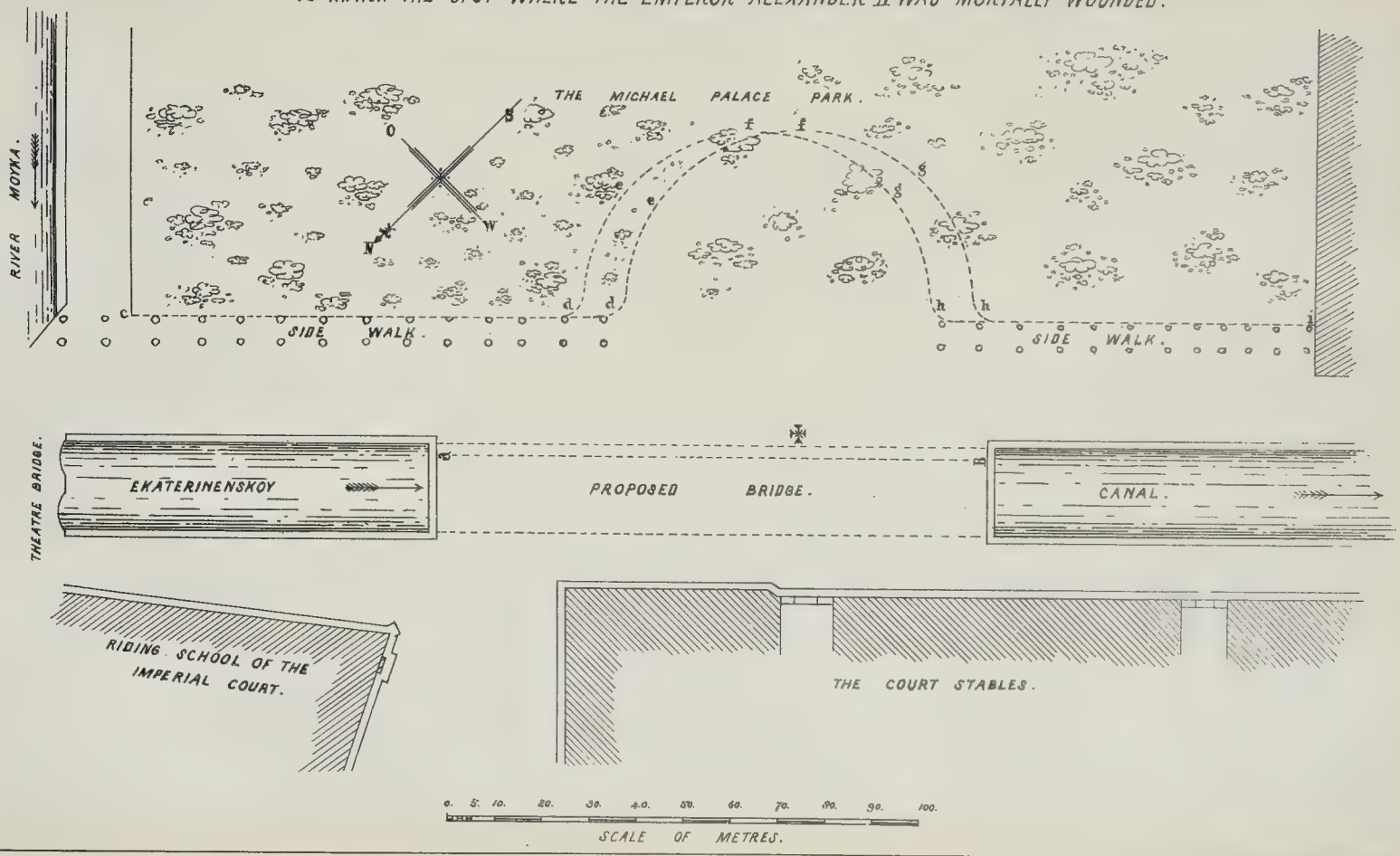
PORTAL OF THE CHURCH OF "SANTA MARIA," AT BELEM, NEAR LISBON, PORTUGAL.



Wyman & Sons Printers Queen.

NEW STABLES, "THE LODGE," WALMER, KENT.—Mr. Jas. Neale, F.S.A., Architect

PLAN SHEWING THE POSITION OF THE SITE OF THE CHURCH PROPOSED TO BE ERECTED TO MARK THE SPOT WHERE THE EMPEROR ALEXANDER II WAS MORTALLY WOUNDED.



NORTHERN ARCHITECTURAL ASSOCIATION.

LOCAL ANTIQUITIES.

THE annual meeting of this Association was held on the 6th inst., in the library of the old castle, Newcastle, the President (Mr. Septimus Oswald) in the chair.

The minutes of the last meeting were read by the hon. secretary (Mr. W. H. Dunn), and confirmed.

The President then read his address, in the course of which he said that the question of restoration or preservation of ancient buildings had more than a general interest to all in Newcastle, as the town possessed many such edifices, some of which it was projected to restore. There was the Black Gate, of which a good deal had been said lately, and the keep of the castle. The proposition to ask the Corporation to have the keep pointed with mortar or cement, under the direction of one of their engineering officials, filled him with alarm. How would they like to see the keep neatly pointed or covered with cement? No doubt decay of the stones was going on daily, but renewal of the most decayed portions from time to time would appear much the better course to pursue. In regard to the proposal to build a bridge from the roadway to the entrance of the Black Gate, he was doubtful, among other things, whether the safety of the entire building would not be endangered by the excavations necessary to such a course; but he made those suggestions with full deference to the opinion of those who had paid more special attention to the subject. He thought that anything done to the gateway should be more in the way of simple repairs than of what is called now-a-days "restoration," which too often meant the destruction of all remains of antiquity. Turning to another topic, he expressed the opinion that the appearance of our grand old churches and cathedrals was enhanced by the proximity of houses and other inferior buildings. The old houses seem to give a scale to a cathedral, and the gradual unfolding of the various parts of such a building added to its charm. It must be observed that he did not for a moment say that those petty structures should not be removed. Considerations of the picturesque were of little moment compared with sanitary and commercial improvement. He pointed out the new building at Amen Corner, which he was of opinion had the effect of "dwarfing" St. Nicholas's Church. He wondered whether those who passed the plans had ever considered its bearings on the "light and air" question as affecting the church, and thought public notice should be given of the intention to erect such buildings. The new churches in the North of England had very little of the picturesque about them. They all smacked of the T-square and drawing-board. In church and in street matters the rules of ecclesiastical commissions and local boards of health had a deadening effect on the imagination of the artist; but the additions and alteration of two or three centuries might render the churches more picturesque and historically interesting than they now are.

The Secretary said he had listened to the address with great pleasure. He had expected something to be said about building societies, but the President had been silent on that subject. As to the restoration of old buildings, that was a question on which they had different opinions; and he, therefore, should not express his opinion. But he must say that he thought the huge brick building which had been erected near St. Nicholas's Church, although a handsome building, out of place, character, and harmony with the ancient edifice. The corporation ought to give notice before they pass plans in which a building like St. Nicholas's Church is affected. The church had been handed down to us in trust, and we ought to be jealous of our old buildings and hand them down to posterity as a great trust. He moved that the best thanks of the meeting should be given to the President for his address, and for the way in which he had discharged his duties during his period of office.

The motion was seconded by Mr. E. D. Shewbrook, and carried unanimously.

The Secretary then read the annual report, which showed that the Society was in a satisfactory condition.

Mr. A. N. Dunn was elected president, Mr. S. Oswald vice-president, Mr. W. L. Newcombe treasurer, and Mr. W. H. Dunn, secretary.

CUMBERLAND AND WESTMORLAND ARCHÆOLOGICAL SOCIETY.

THE Cumberland and Westmorland Antiquarian and Archæological Society has just had its annual excursion, to which two days were devoted.

On the first day the party started in carriages from Egremont, under the guidance of Mr. Jackson, F.S.A., and proceeded by way of Calder Abbey, Gosforth, Seascale Hall, &c., back again to Egremont. At the head of Yeorton Brow, a halt of a minute or two was made, and Mr. Jackson pointed out a level field on the right-hand side as having been the site of Caernarvon Castle, described as "the original seat and still a possession of the family of Le Fleming." Nothing in the way of ruins, however, is to be seen. At Calder Abbey the party alighted, while the carriages drove back to Calderbridge, and a short paper descriptive of the abbey was read by the Rev. Canon Knowles. The ruins were then inspected, and Mr. Jackson and Canon Knowles made some remarks upon three mutilated stone effigies of mailed knights which lie against one of the walls; while Mr. Ferguson, F.S.A., Carlisle, directed attention to what is styled a cresset stone, a square block of red sandstone, having sixteen circular holes. These stones, several of which have been found about old abbeys, had long puzzled antiquaries; and Mr. Lees, of Wreay (a member of this society) claims the credit of discovering their use. It was the business of the cook in the monastery, it appears, to keep these holes filled with tallow or fat, into which a rush was set; and thus fitted up, the cresset stone was used to illuminate the dormitory. A walk along the romantic path by the Calder brought the party to St. Bridget's, Calderbridge, the attraction here being a curious portable or super altar, one of a number which had been blessed by the Archbishop of York about the middle of the fifteenth century, by permission of Pope Nicholas V. The altar, on which several small crosses are sculptured, was found at Calder Abbey, and the vicar of St. Bridget's, the Rev. A. G. Loftie, has had it secured in a frame in a corner of the chancel. The carriages were again put in requisition, and the party drove on to Gosforth Church. Here the curious old cross in the churchyard was inspected, and discussed. Canon Knowles thought the cross was of twelfth-century work, while Dr. Parker considered it much earlier, and narrated what local tradition said on the subject. This was to the effect that the cross had been erected by Danes who settled at Gosforth, and were converted to Christianity. Mr. Calverley thought that some of the figures on the stone indicated the binding to a rock with chains of Loki, the Scandinavian Beelzebub; and Canon Knowles agreed with Mr. Calverley that the carving was of a half secular and half religious character. The party next visited the church, and the Rev. Mr. Wordsworth, the rector, exhibited some quaint old communion-plate, some of it of pewter, and a black-letter copy of the Book of Homilies, folio, 1633. After some little delay, the carriages started again for Seascale Hall, the members gathering in a field adjoining the hall. Mr. Jackson pointed out that the field was surrounded on three sides by water, and was altogether exceedingly well adapted for a fortification; and as it must have been close to the Roman way to the various camps along the coast, he thought it not unlikely that it might have been the site of a camp. To test this supposition, Mr. Joseph Robinson, of Maryport, a member of the Council, and an enthusiastic explorer, had arrived at the field an hour or two before the party reached it, and with the permission of Mr. Walker, he had made a series of excavations on a small scale in various parts of the field; but his labours had met with no reward, no stoneware being discovered. Mr. Ferguson did not think it likely there ever was a camp here, as the field was commanded by rising ground, whence it could be rendered untenable by slings or arrows. The old church of St. Bridget was visited by some of the party, and on the return to Egremont in the evening the excursionists dined at the Globe. Subsequently the annual meeting was held, and papers were read by the Rev. W. S. Calverley on "Illustrations of Teutonic Mythology from Early Christian Monuments in Brigham and Dearham Parishes"; by Mr. Jackson on "The Mesne Manor of Thornflatt and its Owner, 1656-59"; and by Mr. Ferguson on "Church Plate in the Gosforth Deanery."

On the second day, after breakfast at Egremont, Mr. Ferguson read a paper, by Mr. G. T. Clark, F.S.A., on "The Mediæval Defences of the English Border." Mr. T. L. Banks, A.R.I.B.A., then read a paper on Egremont Church. The party afterwards proceeded by train to Ravenglass to inspect the excavations which, for some time, have been going on at Walls Castle, as the remains of a Roman villa, near Walls Farm (the property of Mr. Aaron Brown) are popularly called. Mr. Robinson has been lately excavating here, with most gratifying results, a hypocaust having been discovered, thus satisfactorily dispelling any little doubt that might remain as to the villa being indubitable Roman work. Walls Castle and the adjacent Roman camp were fully described in papers prepared by Mr. Jackson and Canon Knowles, and read at the Society's meeting at Wigton in September, 1876. Mr. Jackson referred to these papers, and described the nature of the excavations and the result of the discoveries made, and he warmly thanked the owner of the ruins, Mr. Brown, for having so kindly given them *carte blanche* to cut up the ground. Mr. Robinson and Mr. Ferguson also spoke, both gentlemen stating that the villa was unequalled by any remains of the kind either in England or France, there being no Roman villa elsewhere which stood over 12 ft. above the ground. Canon Knowles expressed a hope that the ivy with which the building was overgrown would be cut down, and it was stated that Mr. Brown intended to do this.

THE NEW NORTH DOCKS AT LIVERPOOL.

THE new North Docks at Liverpool, opened by the Prince and Princess of Wales on the 8th inst., as already mentioned, practically complete the great northern development of the Liverpool Docks, as authorised by the Act of 1873, which empowered the Dock Board to make an expenditure of 4,100,000*l*. The great northern basin, which, with its entrances, forms the most important feature of the work, has an area of about seven acres, and a depth of water at spring tide of 44 ft., while even at low water there are 12 ft. over the sill. The Alexandra Dock is not only the largest in Liverpool, but it has more quay and shed accommodation than any other in the world. The following is an official description of the new works:—

In 1873 the Mersey Docks and Harbour Board, the trustees appointed for the management of the docks at Liverpool and Birkenhead, having in view the necessity of providing additional dock accommodation to meet the increasing tonnage and size of the vessels trading to and from the port, instructed their engineer, Mr. George Fosbery Lyster, to prepare plans for carrying out that object, and these, after careful consideration by the dock authorities and the shipping as well as trading interest of the port, were approved, and the authority of Parliament obtained to borrow, on the security of the dock rates, the sum of 4,100,000*l*. for the purpose of carrying out the works. The works authorised to be constructed under the above powers consisted of extensive additions to the dock system at the north and south ends of the dock estate on the Liverpool or eastern shore of the river Mersey, and both sections have, during the last eight years, been pushed forward with all the speed that the varied nature of the operations involved in their construction would admit. The section of new docks opened by his Royal Highness the Prince of Wales are situated at the extreme north end of the city, a distance of three miles and a half from the Liverpool Exchange, and within the borough of Bootle. The entrance for shipping is through what is known as the Canada Basin, into which the tide of the Mersey ebbs and flows, and originally formed the vestibule of the most northerly approach to the then existing docks in this locality. This basin has been considerably enlarged and deepened, and its entrance widened from 250 ft. to 400 ft. On each side of its entrance piled timber jetties or piers projecting into the river are intended to be constructed, one being already completed, for facilitating the ingress and egress of shipping entering the docks at this point, as well as for assisting the sluicing operations for keeping the fairway and entrance clear of silty deposits. On the northern side of the basin are formed two docks or passages through which vessels enter the newly-constructed system, the first being the Langton Dock, having a water area of eighteen acres, with quay or berthing space

4,000 ft. in length. In connexion with and opening therefrom on its eastern margin are two graving-docks, each 951 ft. in length. These are so arranged that whenever required they can be subdivided into four docks, each capable of allowing the largest class of vessels to be overhauled or repaired. On the quay, between these graving-docks an important block of buildings has been erected, containing powerful engines and machinery, by Messrs. Hick, Hargreaves, & Co., of Bolton, for the purpose of pumping the graving-docks; also powerful engines for supplying the motive power for actuating the hydraulic machinery for opening and closing the dock-gates, bridges sluices, working cranes and other machinery throughout the system. The latter engines and the hydraulic appliances have been supplied by Messrs. Sir W. G. Armstrong & Co., of Newcastle-on-Tyne.

A number of dwellings have been erected on the "flat" system over this building for the accommodation of the foremen and enginemen. A lofty tower for the purpose of enclosing the accumulator has been built to a height of 120 ft. above the quay, also utilised as a clock-tower. The architecture of this group of buildings is Gothic in feeling.—somewhat freely treated to adapt it to a building of such an exceptional character. Northward of these graving-docks, and also leading out of the eastern side of the Langton Dock, is a branch dock having a water area of three acres, with 2,013 ft. of quay berthing space. Upon the south quay of this dock a hydraulic crane, capable of lifting 100 tons, is in course of construction for the purpose of dealing with heavy boilers and machinery. At the northern quay of the Langton Dock two passages are formed communicating with the dock, specially constructed to meet the requirements of the large and increasing size of steamers using the port, and named at the opening ceremony by her Royal Highness the Princess of Wales the "Alexandra Dock." This dock is 1,600 ft. in length from north to south, and has three branch docks, ranging from 1,100 ft. to 1,338 ft. in length, leading in shore from its eastern quay, and extending to within a short distance of Regent-road, the main thoroughfare flanking the dock at this point. This dock, with its branches, has a water area of 44½ acres, and 11,814 ft. in length of ships' berthing space. To the northward of the Alexandra Dock another dock is in course of construction, having a water area of sixteen acres and 4,000 ft. of quay berth. The quays surrounding these docks are provided with capacious and substantial lock-up sheds of from 80 ft. to 95 ft. in width, for the protection of cargo, and are in direct communication by road with the city, and by rail with the stations of the Lancashire and Yorkshire, the London and North-Western, the Midland, the Manchester, Sheffield, and Lincolnshire, and the Great Northern Railway Companies.

A most important feature in the design of these docks is that of laying the sills of the entrances at the level of 12 ft. below the old dock sill datum, thus giving a depth of water on an average neap tide of 23 ft. 7 in., and on an average spring tide of 30 ft. 10 in., and enabling the general class of vessels using the port to enter or leave the docks at all tides throughout the year, without the delay, expense, and risk of loading and discharging a part of their cargo in the river on low neaps, as has been the case hitherto. On the east side of the main entrance by which vessels enter this new group of docks, a large block of buildings is in course of erection, containing residences for the dockmaster, piermasters, and gatemen; also offices for the administrative staff. The general appearance of these erections is that of a solid block, the yards and drying-ground being arranged in a quadrangle approached by a covered archway. The architecture is a free adaptation of Domestic Gothic, red brick being used instead of stone to obtain the necessary relief. The dock walls are of a most substantial character, and are for the most part built of cement concrete, faced with the red sandstone of the district, the coping being of granite. The entrance walls are faced with granite. The graving-docks, with the exception of the steps and slips, which are granite, are built throughout of concrete. The whole of the dock-gates are constructed of greenheart timber, this being considered by the engineer as the most durable description of timber for this class of work. The additional accommodation for the trade of the port provided by the docks just opened by his Royal Highness, and those at the south end in course of construction, will amount to about 110 acres of water area, with over 6½ miles of quay berth.

It may be added that in carrying out this great work, Mr. Lyster has been assisted by Mr. Fielden Sutcliffe, assistant dock engineer, and latterly by Mr. Lyster, jun. The contractor for the excavations in connexion with these works was Mr. Chas. Tottenham. It is satisfactory to be able to add that the new works have so far been executed without any serious mishap or casualty.

THE LONDON AND ST. KATHARINE DOCKS.

SOME interesting statements were made at the half-yearly meeting of the London and St. Katharine Docks Company, which has just been held. The company may be said to be one of the largest corporations in London, its capital being about 10,000,000*l*. The company's revenue for the six months ending in June last was 555,446*l*. The expenses, however, were unusually heavy, amounting to no less than 409,179*l*., leaving a profit of 146,266*l*., of which 73,021*l*. was absorbed in interest charges, including 12,131*l*. on account of the Victoria Dock Extension. The dividend declared was at the rate of 2½ per cent. per annum only. Adverting to the large outlay which had been incurred in the Victoria Dock Extension, the chairman observed that to his mind the most satisfactory feature was that with regard to what was likely to be the future course of the commerce of the country they had adopted those means which would most likely be beneficial to the company. He remarked that steam and telegraphy had exercised such an influence that it was no longer necessary to hold in our ports those stocks of goods which were formerly held. They had imported something like 40,000 tons more goods than in the corresponding period of last year, in spite of which their stock of goods at the close of the half-year was about 4,000 tons less, and notwithstanding the larger quantity of import goods landed there had been an improvement in the receipts on that head, of only 8,000*l*. When, however, they came to the consideration that in future the trade of this country was more likely to be a transit trade, they would see that in every item which was likely to be important in the future they had had a very substantial increase. Their export rates showed an increase of over 8,000*l*., their tonnage rates on shipping an increase of over 10,000*l*., and their rates for discharging cargo an increase of 9,000*l*. Grain was likely to be one of the largest trades of this country in the future, and whereas in 1880, out of 496,000 quarters in the port, the company had only had 14,000 quarters at the end of the last half-year, out of 175,000 quarters no fewer than 76,500 quarters had been in their docks. Another feature of promise was that they had made an agreement which would bring a large coal traffic into their docks, particularly into their Royal Albert Dock.

THE NEW GRAMMAR SCHOOL AT CARLISLE.

ON the 6th inst. the foundation-stone of the new grammar school, which is to be built at the corner of Spring Gardens and Swifts-lane, Carlisle, in accordance with the provisions of the scheme of the Charity Commissioners, was laid by his Grace the Duke of Devonshire, K.G. The Governors having secured the site, at a cost of 3,250*l*. (towards which the Duke of Devonshire contributed 500*l*.), invited eight firms of architects to send in plans, and five responded to the invitation. Finally, the first premium was awarded to Mr. G. D. Oliver (of the firm of Messrs. Hetherington & Oliver, of Carlisle), Mr. E. R. Robson, of London, being second, and the successful competitor was instructed to prepare specifications and detailed drawings. Last month tenders were invited, and the successful contractors were Messrs. Beaty Bros., Carlisle, 4,591*l*., for the builder's work, and Messrs. H. & R. Court, Carlisle, 2,746*l*., for the joiner's work, making a total of 7,337*l*. To this must be added the cost of painting, slating, and furnishing, and it is thought that the total cost will be at least 10,500*l*.

The main building will (according to the *Carlisle Journal*) be in what is called the Domestic Tudor style of architecture, the materials used for facing the external front walls being red sandstone, the quoins and dressings being "skew chiselled." The main buildings will have a south-east aspect, facing Swifts-lane, and set back 70 ft. from the line of the road, so as to leave a good carriage drive in front. The western elevation is set back several feet from the Spring Gardens-lane. On approaching the new school from Albert-street, the most striking feature in the building will be the central tower, in which the main entrance will be placed, with an oriel window above the porch, and a conical roof. On the right of the central tower, on the ground-floor, are the assistant master's sitting-room, the dining-hall (36 ft. long by 18 ft. 6 in. wide and 14 ft. 6 in. high), with a large bay-window, capable of seating sixty to seventy boys; and further eastward stands the head master's house, with accommodation for about thirty boarders. On the left side of the central tower, on the ground-floor, are the Governors' board-room and a series of class-rooms, which extend northwards in what may be called an annexe of the main building, connecting it with the large schoolroom or prayer-hall, which will apparently occupy the position now taken up by the farm buildings at the corner of Spring Gardens-lane. This hall, which can either be approached by the main corridor which runs from the central tower past the doors of all the class-rooms, or by a covered way leading from the playground and the boarding-house, will be 87 ft. long by 28 ft. 6 in. wide, and runs east and west, with a large window at each end. It will seat about 300. At the south-west corner of the building a chemical laboratory is provided for. The entrance for day scholars will be in the west front, about midway between this laboratory and the large schoolroom or prayer-hall. In arranging the class-rooms special consideration has been given to the purposes for which they were intended; the drawing-class room, for example, being provided with suitable roof-lights.

THE NEW MARINE OBSERVATORY OF HAMBURG.

IN the year 1874, a central institution was established at Hamburg for marine meteorology and storm-signalling for the entire German Empire. The want, then and since felt, of a building specially designed for the scientific purposes in question, has now been met. A structure has been erected, which is described in the German press as not only expressly designed for the purpose required, but as also being an ornament to the city from an architectural point of view.

The site was a gift on the part of the senate and municipality of Hamburg. In the latter part of 1878, Messrs. Kirchenpauer & Philippi (architects of the chronometer-testing house) were entrusted with the preparation of designs for the work, and their plans and estimates were finally approved on July 30th, 1879. Various preparatory works (necessary for securing a ready access to the site) having been carried out, the tenders of August Maas as general contractor for earthwork, bricklaying, asphalte work, &c., was accepted, as also that of the Hanseatic Building Company for stone work; both contracts having been signed on October 3rd, 1879.

During the first half of the year 1880 the work progressed rapidly, and the building was roofed. For the laying-out of the gardens, &c., H. Ohlendorff contracted, and by June, 1880, the magnetic pavilion or compass-observatory was ready for use. The ceremonial of laying the foundation-stone took place on June 15, the stone being placed in a space reserved for it in the entrance.

The internal work has been since carried on with activity, and the opening by the Emperor in person was announced to take place on the 14th inst.

A New Substitute for Timber.—It is reported from America that Mr. S. W. Hamilton, of Lawrence, Kansas, has invented a process for producing what the Americans call "lumber," from straw, by a process which is kept secret. It can be made to any required length, and up to 32 in. wide, will hold nails as well as wood, is water-proof, and takes a high polish. It is about the colour of oak, with a specific gravity of one-fifth more than that of well-seasoned black walnut.

THE ROYAL COURT THEATRE, LIVERPOOL.

THIS new theatre, which stands upon the site of the old Amphitheatre, was opened on Saturday, the 10th inst. The rebuilding has been carried out from plans and drawings by Mr. Henry Sumners, F.R.I.B.A., of Liverpool, and under his supervision. Mr. Sumners found it necessary to sacrifice the whole of the interior of the old theatre, and consequently the gallery, circle, boxes, and stage had to be totally demolished and swept out of the place, leaving nothing but the four bare walls. It was found in clearing away the old timbers for the purpose of remodelling the theatre that there was not a faulty piece of wood in the whole of the place. The T beams spanning the wide building are as good as when first put in their places,—more than half a century ago,—the queen-posts being of African oak. The brick walls showed, in every instance where they had to be cut, that the old Liverpool hand-made bricks have never been excelled. The mortar, too, looked more like mountain limestone than the compound used nowadays. On the 1st of March last, Mr. Sumners entered upon the scene with a body of workmen, who began the work of demolishing the old building with great energy. The rebuilding, decorating, furnishing, and fitting up has proceeded with the same celerity, and in the short space of six months the building stands complete. The stage and all its complicated mechanism has been constructed by Mr. John Byrne. The rock under the stage has been taken out to a depth of 27 ft. This renders it possible to lower scenes through spaces in the stage with great rapidity. Moreover, what is technically called the "gridiron," upon which the blocks and drum winches are fixed, is now about 72 ft. above the stage. The facilities thus gained for raising part of the scenery and sending the remainder down into the sinking in the rock enable the stage to be cleared of all the scenery used in any piece in a very few seconds. The whole of the apparatus for lighting the stage and the other working parts of the theatre has been constructed by Mr. Watmough. The gas-meters are inclosed in brick chambers distinctly set apart from the stage and entirely clear from and not under any part of the auditorium. An ample main for the supply of water for scenic and other purposes has been laid on to the stage and other parts of the house by the city authorities. The auditorium is narrower by 10 ft. than it was before the rebuilding took place, being now between 60 ft. and 70 ft. But the distance from the footlights to the wall at the back of the stage is greater than before, the proscenium wall having been brought forward. Notwithstanding this, owing to the removal of some useless rooms at the Great Charlotte-street end, the auditorium is as large as before. The house will, it is thought, accommodate about 3,000 people. All the entrances are ample in width and easy of access,—that to the boxes, dress circle, and stall is from Queen's-square, and is approached by two folding doors, which are each 6 ft. wide. These doors lead into an entrance-hall about 21 ft. in width, the floor of which is inlaid with Burke's mosaic work. Iron is freely used in the construction of the galleries. The pit is entered, on a level from Great Charlotte-street, by a short passage of 7 ft. in width. The pit floor is raised at the back, and has an incline to the stage of 1 ft. in every 18 ft. The pit seats are of pitch pine, highly polished. The entrance to the gallery is also from Great Charlotte-street, up a well-lighted and capacious stone staircase. It has been the study of the architect to avoid putting a single seat in the theatre, from which the spectator cannot command a good view of the stage. The ceiling, proscenium, and front of the boxes, and also the fronts of the dress-circle and gallery, have been covered with Goodall's fibrous plaster, the materials of which is light, and can be moulded into the most elegant forms. The curtain is of crimson velvet, bearing the royal arms, woven in gold. The act drop, which is the work of Mr. T. P. Hall, of Manchester, represents Thespis reading his play to an assemblage of villagers. On the Queen-square front of the building there are five heads carved upon five medallions of Stourton stone. The middle one is Shakspeare, and he is supported on either side by two busts, one emblematical of tragedy the other of comedy. A bust of Mozart is at the west corner of the front, and of Handel at the east. The carving has been done by Messrs. Norbury, Upton, & Patterson, of Liverpool. Dressing-rooms are numerous and conveniently situated; they are supplied with hot and cold water throughout. The oxyhydrogen gas-holders, for producing limelight effects are the work of Mr. Henry Whitehead, Gaythorn, Manchester. The stage is separated from the auditorium by a brick wall running up to the roof of the building, and the auditorium is again separated in a similar manner from that part of the building containing the entrances and crush-room.

Subjoined are the dimensions of the house:—

	ft.	in.
From curtain line to dress-circle front	40	3
From curtain line to gallery front	42	0
From curtain line to wall at back of pit	70	8
From curtain line to back of stage	50	0
Width of stage	62	0
Height of stage to gridiron	50	0
Depth of stage to mezzanine floor	6	0
Depth of stage to well of stage	27	0
Height of ceiling from pit floor	40	0
Height from pit floor to dress-circle tier	13	2
Height from dress-circle tier to gallery tier	25	7
Height and width of proscenium opening, 28 ft. by 23 ft.		

The brick and rock work has been done by Messrs. Roberts & Robinson, of Liverpool; the woodwork by Mr. Thomas Urmson, of Liverpool; the slating and plastering by Messrs. Johnson & Son, Liverpool; and the ornamentation by Mr. Goodall, Liverpool.

THE "INNER CIRCLE" RAILWAY COMPLETION.

ON the 5th inst. the Lord Mayor of London "cut the first sod" of the works necessary for the completion of the "Inner Circle" of railways. The circle is incomplete by reason of the break between Aldgate and the Mansion House. The subject of the completion of this railway has, as is well known, been the source of much discussion and litigation, but it has at last been settled, chiefly by the advance in the contributions to be made by the public and City authorities to the Metropolitan and District Railway Companies. The Commissioners of Sewers at first offered to give 250,000*l.* towards the project, but finally consented to give 300,000*l.*, which, with the 500,000*l.* promised by the Metropolitan Board of Works, makes the subvention of 800,000*l.*, which will come out of the public pocket to assist the railways in their scheme. The result of carrying out this work of completion will be very advantageous to the public, as the underground communication between the different parts of London will not only be improved, but also the thoroughfares under which it will barrow. The cost of the public improvements to be effected along the line of route is estimated at 1,200,000*l.*, so that the companies will pay 400,000*l.* for their right of way, and 800,000*l.* for the widening of old streets and making of a new one. By this means a fine line of thoroughfare will be established from the Houses of Parliament to the Tower by way of the Embankment, Queen Victoria-street, Cannon-street, Eastcheap, and Tower-street. Starting from the Mansion House, the new line will be in a tunnel under the eastern portion of Cannon-street, going past the King William Statue and under Eastcheap, the houses for that purpose being pulled down, so as to gain a total width of 60 ft. The line will then pass on by way of Little and Great Tower streets as far as Mark-lane. At this point a new street will commence, passing round by a curve on the north side of Allhallows Church, and terminating in Trinity-square. The railway will, however, continue its underground course, curving round in a northerly direction so as to cross the Minories and run at the back of that thoroughfare up to Aldgate. Mr. Walker is the contractor, and it is anticipated by Sir Edward Watkin that the work will be completed in about eighteen months.

RAMSGATE.

THE Smack Boys' Home, lately erected in the Royal Harbour, Ramsgate, from the designs of Mr. Alfred R. Pite, of Bloomsbury-square, was opened last week by the Marchioness of Conyngham. The work has been carried out by Mr. W. Martin, contractor, of Ramsgate, at a cost of 2,000*l.* The accommodation provides for sixty boys, having, on the ground-floor, spacious messroom and offices; and on the upper floors, dormitories with double berths, work-room, washhouse, laundry, and locker-room. The institution, it is anticipated, will be self-supporting; but the present building has been erected by voluntary subscriptions.

USES OF FAURE'S ACCUMULATOR IN ELECTRIC LIGHTING.

AT a meeting of the Mathematical and Physical Science Section of the British Association, Sir W. Thomson read a paper on this subject. He observed that the first and most obvious use of Faure's accumulator was to produce the electric energy at a most convenient time, and keep it in store until it could be most conveniently used. It was obvious that great economy and important practical results were to be obtained by the use of such a system, provided the expense of the storing material, and the magnitude and bulkiness of the apparatus that it involved were not prohibitory,—were not such as to run away with whatever gain there might be in the principle. The subject was altogether in its infancy, and we must wait for greater information, both as to its practical and economic side. So far as estimating electric quantities was concerned, we must hold our hands until incandescent lamps were given us, with a statement that they would burn at so many candles power, approximately, when so many volts were applied to them, and for such and such a time. One use of the Faure accumulator, which was obviously of great value, was that of connecting the working machine with the dynamo-machine, in order to fulfil the first condition of giving greater regularity than could be attained, or was practically attained, without it; and, in the second place, of being ready to sustain the light for several hours after the driving machine was stopped.

Dr. C. W. Siemens said, if Faure's battery could be used as a store to be resorted to at any moment by means of an automatic arrangement, there could be no doubt that very valuable assistance would be given to the practical electrician in carrying out almost every application of electricity, not only to lighting, but to the transmission of the power. The only danger was that, if the sources of power failed, there was an interruption, and the effect of these interruptions was very trying, in the case of lighting especially. The arrangement shown by Sir Wm. Thomson seemed very efficacious and valuable.

Mr. Swan, of Newcastle, the inventor of the incandescent light, expressed satisfaction with the paper of Sir Wm. Thomson. He thought, however, there was some difficulty in the way of adopting his system. Under existing arrangements the accidental throwing off of a belt extinguished the lights when the dynamo-electric machine was exclusively depended upon for producing the current. It seemed that the addition of Faure's battery to this method of supply (especially when used as Sir Wm. Thomson proposed to use it, viz., as a store and a regulator, with the addition of his automatic circuit opener) was the very thing wanted to make electric lighting all that was needed. He had recently experimented as to the use of the Faure battery in connexion with his own lamps, and he found it to work admirably. He could not express the delight he felt in the prospect that lay before them of using the battery in connexion with our other means of producing electric currents.

RUINING STONEHENGE.

WE can scarcely believe what we hear from Stonehenge. According to the *Salisbury Journal*, "the only remaining outer trilithon on the north-eastern side of the rings has been bolstered up by means of a gallows-like wooden erection, very similar in construction to that which supported Temple Bar during the last months of its existence. This is placed transversely beneath the upper stone; and, as it is of a very substantial nature, it completely destroys the picturesque effect of that side of the ruin. The trilithon in question seems to us to be quite as erect and safe as any of the stones, and probably more so than the majority of them; and we cannot conceive why it should have been chosen as a *corpus vile* for the 'restorers' to begin their experiments upon. The huge pillar which inclines inwards on the south-western side will, presumably, be next taken in hand, for, since the work has been commenced, it is but natural to suppose that it will be completed, and that all the stones will ere long be safely buttressed by a number of unsightly props and scaffoldings." This unnecessary disfigurement of a national monument of extreme value and interest should at once be protested against by all who have any influence likely to weigh against its perpetration. Who is responsible for it? It seems almost like a piece of spite in reply to those antiquaries who

have recently been urging the necessity of setting upright some few of the stones that are obviously slipping. No individual should have it in his power to damage such a monument as Stonehenge, even under the guise of protecting.

VERGERS AND CATHEDRALS.

SIR,—In your number of the 13th ult., under the heading "A few Modest Suggestions," for the approaching meeting of the British Association at York, your correspondent, "F.S.A.", suggests *inter alia* an intercession with the Dean to allow the cathedral to be seen without the intervention of an "illiterate verger," and he follows with an account of an infliction he underwent from one of those custodians whom it seems to be the peculiar province of Deans and Chapters to appoint. It is devoutly to be hoped that the authorities, acting on this seasonable suggestion, mercifully spared the members of the Association who were gathered together in that grand old city a repetition of the infliction to which "F.S.A." refers, and have permitted the Minster to be seen without the irritating accompaniment of a string of mild jokes.

When will Deans and Chapters recognise the fact that they are only the trustees of these glorious buildings, reared by our pious forefathers to the glory of God, and handed down to us as a precious possession, to be held and preserved with loving care, for generations yet to come? Let us for a moment consider the feelings of one of our educated Transatlantic cousins, who, on visiting the "old country," as some still affectionately term it, enter for the first time one of these grand temples and experience the (to them) new sensation of its strange and weird magnificence bursting on their view with all its grand effects of light, form, and colour, and then, sir, like a spider from his web watching a fly, pounce comes the aforesaid custodian, and with what "F.S.A." calls his "miserable twaddle," leads them like a flock of sheep the accustomed round. What, indeed, can the enlightened foreigner think of us? I, too, have just undergone a similar infliction, when, a few days since, I visited one of the finest of our cathedrals,—the only example, I believe, conceived, planned, and carried to completion in one style of architecture. Would that I and my friends had been left alone to the quiet enjoyment of the feast; but no, the moment the choir-gates were entered down comes the verger, "This way, please, I am just going round; that's the organ divided into two parts, the pedal pipes and the 'bellus' is in the transept"; and thus through the show like the keeper at a menagerie. "That's a wonderful brass; notice the hares and rabbits; that screen was removed from another part of the cathedral; they employed an 'architec' at the end of the last century: he did everything all wrong, and they have been undoing everything he did. That's a cope-chest; they used to wear copes of velvet, embroidered with gold, and that's where they were kept. Notice the 'cullums,' they are all of Purbeck marble; they can't get any of this size now. That's a splendid monument; it cost 600*l.* to restore; you see the figure of the lady is placed over her husband, because she was higher in rank." But the climax was reached in the chapter-house when beginning the description of the quaint sculptured groups at the creation, we were told, "That's Eve, with the apple in her hand, a-giving it to her husband. That's Joseph, being put in the pit, head downward." But, enough of this. The description was continued in a kind of nasal chant until the door was again reached. "You will find it all in the Guide-book, price one shilling." I was taken to a table, and told to enter my name in the book, and to put 6*d.* in the bag for each of the party. To this fee I make no demur. Few would object to contribute towards the maintenance of this glorious pile. I must, moreover, acknowledge the politeness and attention of our guide; on this ground no complaint could be made. I asked to see the library, but was told that the key was kept by the librarian, and that it was only shown on certain days. Why only on certain days? Is it too much to expect that every part should be open without restriction?

In conclusion, may I venture on a suggestion that the Dean or some one of the cathedral dignitaries should disguise himself, and, like the "Amateur Casual," undergo the infliction in person? But, if this be declined as quite too painful, send a shorthand writer, and let him take down *verbatim et literatim* this miserable stuff, from which the unfortunate visitor is unable to escape. Lay this before the Chapter at their next meeting, when, if they will be at the trouble to read it, perhaps it might be "reformed altogether," and at my next visit I may find some more intelligent guide, or, failing this, be permitted to wander in contemplation and peace. C. T. H.

SIR,—I was surprised to see the letter by "F.S.A.," complaining of want of attention, &c., at York Minster. Permit me to say that three months ago I was shown over by one I thought a model of politeness and intelligence. My visit was a long one. I made several notes, and spent an hour in the crypt,—in fact, gave an unfair amount of trouble, I thought, for a stranger. I should like some of your readers, particularly "F.S.A.," to visit the Abbey at St. Denis, and experience what rudeness really is. I do not think they will find it in any abbey in England,—certainly not at York Minster.

SYDNEY SMIRKE.

*** This may be quite correct, doubtless is so, but it does not at all affect the correctness of "F.S.A.'s" complaint, which has since been confirmed by other correspondents. "F.S.A." said nothing of "rudeness," he simply objected to the illiterate twaddle that was talked.

THE BRITISH ASSOCIATION AT YORK, SEPTEMBER, 1881.

"A Picture in Little."

A's the Association of far-spreading fame,
B stands for British, who gave it its name.
C's Correspondence enormously great;
D's for the Dinners the visitors ate.
E's for the Engines which didn't explode;
F is the Fun travellers had on the road.
G stands for Gossip, so tripping and light
H Howard Castle, sightseers' delight.
I Indian presents by our Prince sent down,
J for the Jubilee held in the town.
K for the Kindness evinced everywhere
L Local secretaries with patience rare.
M for the Minster, so stately and grand
N for the Noodles who won't understand.
O is the Ouse, which enriches the town;
P is the President, of wide renown.
Q stands for Queries, excuse for much talk;
R for the Railway which took folks to York.
S is for Science, the real *raison d'être*,
T for Tea-table talk, and *tête-à-tête*.
U's for the Units too late for each outing;
V is the Voice which grew hoarse with much shouting.
W is for Whitby, renown'd for its jet;
X the policeman whom nothing could fret.
Y is for York and its int'resting "questions,"
Z is for Zoology, one of the "sections."

R. F. H.

THE ANCIENT LAND LAWS OF INDIA.

SIR,—Students of Sanscrit are unanimous that the ancient land laws of India are the oldest established on the globe. The royatwar, or individual settlement, by which the royatwar, or cultivator, pays rent for the farms he himself cultivates, and should they prove unproductive owing to a dry season he is entitled to an abatement, is a judicious mode by which the industrious are not made to support in indolence an idle portion of the community. A permanent royatwar is a fixed sum paid in all seasons for the farms the cultivator occupies. The landlord, accompanied by the taseldars, makes a personal inspection of the uncut crops, which enables him to judge where remissions should be afforded. That the Irish members, with all their eloquence and capacity for obstruction, should have omitted an uncut clause in the Irish Land Bill completely overwhelms me. It will be a good day for England when the students at Oxford, Cambridge, and the boys of St. Stephen's will learn more Sanscrit and less Greek. PIERSE ARTHUR.

CEMENT AND VEGETATION.

SIR,—I am about to plaster with Portland cement a house in Devon, surrounded by trees, many of which are close to it. I wish to throw sand against the cement before it has set, to give it colour and a rough appearance, but I am advised to finish off the cement smooth, lest the sand should promote the growth of vegetation in this damp climate. Others tell me that nothing ever grows on Portland cement.

The house stands on the top of a hill, above all damp from valleys, and in a dry situation apart from trees. My desire is to use the sand for the sake of appearance, but I shall be glad to hear what others say.

DEVON.

DEVELOPMENT OF THE COLOUR SENSE.

SIR,—The discussion upon this subject at the meeting of the British Association, I must confess, somewhat surprised me. The general conclusions of modern science are sometimes lost sight of in special studies. Thus colour in the paper referred to is regarded as an entity external to sense, which the eye either spontaneously perceives, or has to be developed to perceive; whereas, according to the received theory, colour, as colour, has no existence whatever, save and except as a mechanical vibration. Colour is a condition of the optic sense, coeval in all probability with the existence of an eye. We might as reasonably talk of the development of the sense of heat. From one simple point of view, indeed, namely, in the sensitiveness of nervous organisation to appreciate delicate variations in the modes of force, there may have probably been progressive development. The characteristics of what we term "culture," "refinement," are indications of a change towards higher nerve sensitiveness. Fondness for violent contrasts in sensation belongs to the barbaric state. There are eyes in animate being which possibly exceed the human in sensitiveness. Nerve development has probably a human limit, beyond which it can no farther go. To this goal is progression, and from it decadence. It would appear as if human nature itself, as all cosmical phenomena, were amenable to the eternal tidal action of ebb and flow.

METER.

SMOKY CHIMNEYS.

SIR,—In reply to a last week's correspondent, I beg to tell your readers that they may cure a great many smoky chimneys by the use of fine wire gauze in front of the fire-place, and that the success depends entirely on the gauze curtain approaching very nearly to the character of a "blower." The finer the mesh and the nearer the gauze-curtain is brought to the fire-bars, the more violent is the draught you get; but though in some or many cases a smoky chimney may be cured, a certain price has to be inexorably demanded for it and paid. The air which has passed away must and will be replaced. If it cannot be replaced by pure air, it will be replaced by foul.

EDDK. EDWARDS, JUN

Sir,—In lieu of a sheet iron blower, use fine wire gauge (that used for meat-safes), iron or brass, to suit the room, strained over an iron wire frame, and suspend by pins from the centre of the grate. The writer has used blowers of this description for the past thirty years, and there is nothing better. I think the *Builder* gave me the idea. EDW. COBFIELD.

A VIKING SHIP.

SIR,—Allow me to thank you for the excellent *resumé* you give, in your number of September 10th, of the paper I read before the British Association on the Viking ship. I trust it proves of interest to your readers. Though generally most correct, there are one or two errors, doubtless stenographic in origin, which I should not like perpetuated, and, therefore, may I ask you to kindly insert these lines?

Bow and stern are similar in shape and are *pointed*, not *painted*. This is an important fact, because the shields show signs of paint, but the timbers of the boat none. Then again, "In the Frithiof Saga, however, the 'ball of copper' was spoken of." This should of course be "keel of copper." Also "Starboard was a corruption of the word 'starboard,' which, no doubt, owed its origin to the ancient position of the rudder, as in this galley." *Starboard* should be *steerboard*. The vessel was excavated at Golestad.

The sepulchral chamber was tent-like in shape, made of logs placed side by side, leaning and meeting on a ridge-pole running parallel with the main axis of the ship. There is nothing about "the side running." The treaty made, at the end of the Vikings' descents on Scotland, was between Malcolm and King Sweno of Denmark.

J. HARRIS STONE, M.A.

TREATMENT OF CANDIDATES.

MIDDLESBROUGH AND STOCKTON BOARD.

AT the last ordinary meeting the Board proceeded to appoint a general manager for the waterworks, at a salary of 500*l.* a year. One hundred and nineteen applications had been received in reply to the Board's advertisement, many of the applicants having had extended experience in connexion with waterworks. Alderman Williams proposed Mr. D. D. Wilson, of Middlesbrough, a recently retired member of the Water Board, Mr. W. Jones seconding.

Mr. John Dunning proposed that the Board should choose out of the list of applicants three or four for consideration. He trusted they were not going to make a farce of the business in getting gentlemen to send in applications for the vacancy, if the applications were not entertained. Mr. D. D. Wilson had criticised the expenditure of the Board, but the members would now be able to see what he meant at.

Mr. Knowles (Stockton) seconded the amendment, saying he would be no party to a foregone conclusion.

Mr. Smith (Mayor of Stockton) thought they were acting dishonestly in the case of the gentlemen who had applied; some had even said that the appointment had been arranged beforehand.

Eventually, upon voting, Mr. D. D. Wilson was appointed by seven votes to two.

It was arranged to meet in a fortnight to draw up an agreement with Mr. Wilson.

IZAAK WALTON'S HOUSE.

THE block of houses between Bell-yard and Chancery-lane, facing Fleet-street, will shortly be demolished in order to widen the roadway in front. It is claimed that one of these houses was once the residence of the author of "The Compleat Angler, or Contemplative Man's Recreation." Peter Cunningham, in his "Handbook for London," vol. i., writes,—"Isaac Walton's house was about the seventh on the left-hand side as you walk from Fleet-street into Holborn. He lived here from 1627 to 1644." Thornbury, in "Old and New London," is more precise as regards the locality:—"Izaak Walton, that amiable old angler, lived for some years (1627 to 1644) of his happy and contented life in a house (No. 120) on the west side of Chancery-lane (Fleet-street end)." Certsin it is that, at two periods during his residence in London, Walton occupied a house in Fleet-street. A deed, bearing date 1624, in which year Walton was married, expressly describes Walton's abode to have been "on the north side of Fleet-street, in a house two doors west of the end of Chancery-lane, and abutting on a messuage known by the sign of the Harrow. The second period at which Walton was a resident in Fleet-street is shown by the parish register of St. Dunstan, Fleet-street,—"1633-4—March 21. Henry, son of Isaac Walton, was baptized, out of Fleet-street." The same register shows that in the previous year Walton resided in Chancery-lane:—"1632. —October 17. Henry, sonne of Isaak Walton, was buried, out of Chancery-lane." These entries refer, of course, to two different children, both of whom died in early infancy. It is well to preserve, as far as improvement will permit, any visible record that will recall "meek Walton's heavenly memory," as Wordsworth sings; but none such exist in Chancery-lane or Fleet-street. Walton's residence in the latter was pulled down in May, 1799, to widen the entrance in Chancery-lane, in which no vestige of what might have been the residence of the hosier-angler now exists,—even its position is a matter of doubt. Had either of the above houses existed in 1805-7 it would certainly have been noticed by "An Architect" who, during these years, contributed a long series of elaborate papers to the *Gentleman's Magazine* on the old houses of London, more especially those in Fleet-street and its neighbourhood.

STRATFORD-ON-AVON CHURCH.

THE LATE MR. HARVEY EGINTON.

SIR,—Your inquiry as to the drawings of Stratford-on-Avon Church restoration has just now reached me, as I am the only remaining relative of the late Mr. Harvey Eginton,—I am his sister. All drawings, &c., relative to Stratford and elsewhere became the property of his head clerk (Mr. Field), who shortly after went to Australia, and in about two years' time died suddenly in a street there. I do not know any of his relations or friends, so I fear you will fail to trace the information you require.

EMILY AUDLEY EGINTON.

CHURCH-BUILDING NEWS.

Micheldever.—The parish church of Micheldever, Hants, has been re-opened, after having undergone extensive alterations and restorations at the expense of the lay rector, the Right Hon. the Earl of Northbrook. It is reported that about the year 1806 the church was destroyed by fire, but nothing has been found during the progress of the work to corroborate this; at any rate, a few years afterwards the church was rebuilt by Sir Francis Baring, this being completed in the year 1810. It then remained without alteration (with the exception of a new east window to the memory of the late Lord Northbrook) up to the commencement of the present restoration. Up to this time the church consisted of a western tower (sixteenth century) massive and embattled; a nave in the form of an octagon, with two quasi-transepts (1810) built of red brick and covered with slate, and having heavy plaster arches and mouldings in its inside. The old chancel was covered with cement on the outside, and encumbered with very heavy plaster mouldings and arches inside. The seating was of oak, narrow and uncomfortable, and placed on a stone floor. The improvements consist of the entire restoration of the chancel; the insertion of a panelled and moulded wooden ceiling, richly coloured and gilt; a new chancel arch, with marble columns: a glass mosaic pavement; oak stalls, altar-table and prayer-desk; brass altar-railing and standards, marble credence; carved stone pulpit and new oak seating. A fine old stone arch of Early Perpendicular work has been brought to light and restored. The west window has been filled with stained glass, the gift of Mr. W. Gale, of Micheldever. The total cost, exclusive of its lectern and west window, is about 2,600*l.* which has been borne by the Earl of Northbrook. The work has been carried out under the superintendence of Messrs. John Colson & Son, architects, Winchester. The chancel contains many beautiful monuments to various members of the Baring family, by Flaxman, to which Lord Northbrook has added a marble monument by J. E. Boehm, A.R.A., to the memory of the late Mr. Thos. Baring, of Norman Court. During the progress of the work several fragments of earlier work were brought to light, viz., the remains of two marble fonts of Norman workmanship, pieces of Early English, Decorated, and Perpendicular work, being the remains of a large vaulted ceiling, and a stone screen or reredos of large dimensions. The latter had been decorated with colour and gold, showing that there existed at some time a church of more than ordinary pretensions on the spot.

Taunton.—The new Church of St. Andrew, Taunton, has been consecrated by the Bishop of Bath and Wells. It is erected at Rowbarton to supply the wants of a rapidly-increasing district, near the Great Western Railway Station. It is built of Westleigh stone, with Doulting stone dressings, the walls being lined internally with ornamental brickwork. It consists of a nave, 73 ft. by 18 ft.; north and south aisles, 73 ft. by 9 ft.; chancel, 27 ft. by 18 ft; north transept, 16 ft. by 9 ft.; entrance porch; and vestry. The tower forms the south transept, and is surmounted with a wooden spire covered with Westmorland slate, and is 100 ft. high to the weathercock. The nave arcade is carried on octagon brick piers, the arches being also of brick in colours. The roofs are open-timbered, covered with plain tiles and plastered between the rafters, except the chancel roof, which is boarded and decorated. The benches are open and of pitch pine, with moulded and framed ends. The passages and chancel are laid with Minton's tiles. The pulpit and font are of Beer stone. The east and south windows of the chancel, also the ten quatrefoil windows of the clearstory are filled with stained glass by Hardman. The church will seat about 500 persons, and the cost has been about 3,000*l.* It has been erected from the designs of Mr. J. Houghton Spencer, of Taunton; the builder being Mr. H. J. Spiller, also of Taunton.

Brynamman.—The Bishop of St. David's has consecrated the new church which has been erected at Brynamman for the accommodation of the 200 persons who, some two or more years back, severed themselves from the Welsh Congregationalists' communion in order to join the church of their forefathers. The building will accommodate 300 persons. It consists of nave, 55 ft. long by 25 ft. wide; and chancel, 26 ft. long by 16 ft. wide. The latter has a small aisle on the south side, and the former a baptistery against the west wall next to a double porch, while on the north side of the chancel a commodious vestry with fuel chamber beneath is provided. The walls are substantially built in courses with dark grey local stone, relieved by windows and dressings of Westwood stone, and the roofs are covered with light grey slates from the Whitland Abbey quarry. The interior, which is well lighted by twelve tracery-headed windows and ten lancets, has lofty side walls and high-pitched roofs, giving a total height of 36 ft. in the nave. The chancel has a boarded ceiling. The pulpit, lectern, stalls, and seats generally are all of pitch pine, the latter fixed upon raised wooden platforms, while the pavements consist of a mixture of stone flagging and Webb's (Worcester) encaustic tiles in patterns. The altar standards were made by Mr. T. Brawn, of Birmingham, in wrought iron and brass work, and the stone carving has been well executed by Mr. Clark, of Hereford. Ample means both for warming and ventilating have been provided, one of Porritt's underground stoves, with flue running the whole length of the nave, being introduced for the former purpose. The whole outlay has not exceeded the original estimate of 1,500*l.* The contractors were Messrs. Balcombe & Price, of Pembroke Dock. Mr. Hay, of Brynamman, acted as clerk of works, under the general direction of the architect, Mr. E. H. Lingen Barker, of Hereford.

St. Breock (Cornwall).—After undergoing restoration, the parish church of St. Breock, near Wadebridge, has been re-opened. The church, which consists of a nave, chancel, south aisle, two little transepts, and a tower, was erected in the sixteenth century. Some time since, owing to the dilapidated state of the church, consequent on the dampness of the situation, it was found necessary to have the building restored. It was resolved, after a while, to have the church renovated, and Mr. J. Piers St. Aubyn was appointed the architect, and the contract was let to Mr. Searle, of St. Austell. The walls, although they have not been rebuilt, have had to be thoroughly renewed,—pointed outside and plastered inside. The church has been thoroughly drained and reseated, open benches of pitch-pine taking the place of the old square pews, and the floor-spaces in the chancel have been covered with tiles, supplied by Mr. Godwin, of Lugwardine, Hereford. The stonework of the arcade has been cleaned, and a stone archway has been made to the two transepts. The roof has been thoroughly repaired, the old wagon-headed shape being retained, with carved bosses by Mr. Webber, of Bodmin. The windows have been reglazed by Messrs. Fouracre & Watson, of Stonehouse. The cost of the restoration is estimated to be 1,400*l.*, and the work has been carried out under the superintendence of Mr. Collins, of Wadebridge, the clerk of the works.

Liverpool.—The foundation-stone of the new church of St. Stephen the Martyr, Liverpool, has been laid by the bishop of the diocese. The church, which originally stood in Crown-street, was taken down owing to the opening up of the tunnel from Lime-street to Edge-hill, and is now being rebuilt, stone for stone as before, on a new and eligible site at the angle formed by the juncture of Crown-street and Grove-street. Great pains have been taken to find the original foundation-stone, of which no information could be obtained, and it was not until the whole church had been taken down that the stone was discovered. On this account the building has been considerably advanced without any attempt at a stone-laying. The long-sought stone having been found, it was decided by the incumbent, the Rev. E. P. Hodgins, D.D., to have it re-laid. The church has been taken down owing to the opening up of the tunnel by the London and North-Western Railway Company, and is being rebuilt on the lines of the original church, as designed by the late Sir Gilbert Scott, under the direction of Messrs. Thomas D. Barry & Son, architects, Liverpool. Mr. John Miller, of Liverpool, is the builder, Mr. Peter Thomas being the clerk of the works.

SCHOOL BUILDING NEWS.

York.—The memorial stone of a new wing to the Industrial Boys' Schools, Mary-gate, York, was laid on the 6th inst. by the Dean of York. The wing will cost 800*l.* The architect is Mr. De Maine, the contractor being Mr. Dennison.

Glossop.—A new school in connexion with Littlemoor Chapel, Glossop, has been opened. The structure now completed is a portion only of a larger scheme, which includes a range of class-room two stories in height, to be built hereafter in the rear of, and connected with, the present school-room. When that extension is added, the partitions now enclosing the two stories of six class-rooms at the east end of the school-room or assembly-hall will be removed. The height of the hall is 34 ft.; viz., 24 ft. to the wall-plate, and 9 ft. in the roof with sloping sides. The floor area of the hall, including the eastern class-rooms, will accommodate 550 adults seated at a lecture or concert. The gallery, which extends along each side, and at the western end of the hall, and is two seats in depth, will accommodate 200 adults, also seated. The three western class-rooms have fixed seats on raised platforms, which are practically a continuation of the gallery. These will accommodate 150 adults. The total capacity of the hall is thus for 900 adults comfortably seated, besides the occupants of a speaker's platform or orchestra. The principal elevation, or front of the building, is towards Victoria-street, which is on the high road from Glossop to Hayfield. This street rises considerably, and the site also rises still more rapidly from front to rear. At the south-west angle of the front a turret, nearly 12 ft. square, is placed, which rises to a height of 75 ft. from the ground to the top of the vane. Turning to the left, after

passing through the porch, a spacious lecture-room is entered. This apartment is 36 ft. long, 20 ft. wide, and 15 ft. high, and is well lighted by front and end windows. In the north-west corner is a lift from the basement chamber, where the tea-boiler is fixed; and immediately opposite are steps up to a service doorway which opens into the assembly-hall. (The floor of the hall is 5 ft. above the lecture-room floor.) There is also a gallery for 100 infants, which is so constructed as to be readily taken apart and put together again. The steps are also movable, and these and the infants' gallery can be stowed away in a chamber provided for the purpose underneath the assembly-hall floor. Native rubble stone has been used for the walls throughout; those towards Victoria-street and the chapel burial-ground (north) being faced with pitch-faced wall-stones from local quarries. All the block stone for the dressings is also from local quarries, and some red stone from Runcorn has been introduced. The roofs are covered with slate, and all the internal woodwork is of pitch-pine, varnished. For warming the building throughout Gibbs's system of hot-water pipes has been adopted. The style is Italian Gothic. A contract was entered into with Mr. Aaron Haughton, of Godley, for the whole of the work, at 2,570*l.*, his manager and foreman on the building being Mr. F. Wilson. The architects of the building were Messrs. Paull & Bonella. The total cost, inclusive of movable fittings or furniture, and play-ground and fences, architects' commission, and payment to clerk of works, is about 2,880*l.*

Rhyl.—Christ Church British Schools, Rhyl, have been completed and opened. They occupy a site at the corner of Crescent-road and Vaughan-street, including altogether some 1,200 yards of land, and are arranged as follows:—The ground-floor is prepared for the use of girls and infants, with entrance from Vaughan-street; the upper floor for boys, or mixed school, as may be determined upon, there being a total accommodation for at least 800 children, should the whole premises be used for teaching purposes. The infants' school is 32 ft. by 25 ft., with a large bay window in one side, and an open-timbered roof. A special room for babies is provided, 18 ft. by 15 ft. The girls' schoolroom is 90 ft. long and 22 ft. wide, and has large windows all down one side, kept well up from the floor, and going close up to the ceiling. A class-room, 27 ft. by 22 ft., is entered from the side of this room, and two others from the end, respectively 24 ft. by 22 ft. and 22 ft. by 16 ft.; stairs for communication with the mixed schoolroom over, and closets for books, &c., being provided between these class-rooms. The boys (or mixed) schoolrooms, &c., are on the first-floor, with entrance from the play-ground at the back, and private communication as before with the girls' rooms below. The large schoolroom is 60 ft. by 22 ft., with lofty open-timber roof, windows all down one side and one end, the other end having two large class-rooms, respectively 24 ft. by 22 ft. and 22 ft. by 16 ft., separated from the large room by sliding screens of pitch pine and glass, so as to be thrown into the large schoolroom or used separately as may be desired. Three other class-rooms are also provided, of somewhat similar dimensions to those named, with book-rooms, &c. The exterior is in brick and terra-cotta work. The architect is Mr. C. O. Ellison, of Liverpool. Messrs. Collin & Son, Warrington, were the general contractors, and Mr. Hammond has been clerk of works.

The Royal Polytechnic Institution finally closed its doors as a place of scientific amusement, if we may so term it, on Saturday last, having had a career of more than forty years. It had for some time ceased to be a remunerative concern to the shareholders. When it had been in existence ten or twelve years a rival to it, known as the "Royal Panopticon," Leicester-square, was projected and started, but the career of this latter venture was very short, the building (specially erected for it from designs by Mr. T. Hayter Lewis) having been for the last twenty years and more known as the "Alhambra." The Polytechnic was established before the days of Crystal Palaces and Great Exhibitions, and has fulfilled a useful function. Now its career is closed its promoters may congratulate themselves in remembering that many of its best features have been imitated by other institutions. There is no denying that it had become very dull and very dusty.

Miscellanea.

Burning of the Park Theatre, Camden Town.—The Park Theatre at Camden-town was totally destroyed by fire early on Sunday morning last. The theatre, which was originally known as "The Alexandra," and was erected some nine or ten years ago from designs by the late Mr. H. C. Robinson, who held the appointment of Architect to the Department of the Lord Chamberlain, was situated at the eastern end of Park street, Camden-town. The performances on Saturday night terminated about a quarter past eleven o'clock, when it was supposed that the gas had been properly turned off, that the theatre was closed, and that all the *employés* had left the premises. A few minutes before twelve a police constable observed smoke issued from the stage end of the building. He at once raised an alarm, and, in company with another constable, rushed into the stage entrance. To their astonishment they found a number of the actors and actresses, who had been engaged in the performance, packing up their dresses and properties in the lower part of the building. They had observed a smell of smoke, but were not aware that the place was on fire. The fire seems to have originated in the upper portion of the stage, probably in or near one of the dressing-rooms. Scarcely had the discovery of the smoke been made when flames burst out. The firemen directed their efforts to confining the fire within the building, and, in consequence of good outer walls and of the body of water thrown on the fire, by about one o'clock it was felt that this object had been attained, but it was not until between four and five o'clock on Sunday morning that it was finally got under, by which time the entire theatre was gutted. The old story; and yet in this case the existence of the fire appears to have been discovered even before the appearance of flames.

Manchester Royal Institution. — The negotiations for the transfer of this institution of the fine arts to the Manchester Corporation have been concluded on the eve of the opening of the annual autumn exhibition of pictures. The proposal of the governors or proprietors of the institution, about 350 in number, was to hand over their land and building in Mosley-street, with its pictures and statuary, to the municipal body, free of all cost but the payment of chief rent (about 100*l.* a year), and a guaranteed endowment from the city rates of 2,000*l.* a year for the purchase of pictures to enrich the permanent collection. This offer was agreed to by a committee of the corporation on the understanding that the endowment should be limited to the next twenty years, anything contributed after that to depend upon the public opinion of the time. The proprietors will hold one-third of the seats on the future committee of management, and their individual privileges of admission to exhibitions or lectures will be preserved. The art-gallery will be open free to the public on such days of the week as the committee shall determine. All proceedings of the governing body are to be submitted to the civic council for confirmation, as provided by the Municipal Acts. The building thus acquired by the public was erected from the designs of the late Sir C. Barry.

The New Town Hall at Staines has been opened. It has been erected from the designs of Mr. J. Johnson, architect, London, whose plans were chosen out of forty-five sets submitted in competition. The contract price for the hall was 4,797*l.* The building contains two assembly-rooms, one capable of containing 500 seats, and another about 250, whilst there are offices for clerk, surveyor, &c. At the top of the building are five rooms for the hall-keeper, and two kitchens in the rear. There are also ante-rooms, cellarage, lavatories, &c. At the rear of the building will be an ornamental garden with river-wall and promenade, an access from the Themes by a set of steps being also contemplated.

Mr. D'Oyly Carte's New "Savoy" Theatre will be opened at the end of the month, with "Patience," for which new scenery has been painted. The whole of the interior fittings, plastic work, upholstery, &c., have been designed and carried out by Messrs. Collinson & Lock.

Oxford High School for Boys.—The new High School for boys, erected in George-street, from the plans of Mr. T. G. Jackson, M.A., architect, the foundation-stone of which was laid by Prince Leopold some time since, was opened by the Earl of Jersey on Thursday, the 15th inst.

Sanitary Dwellings.—A meeting was held on Saturday, under the auspices of the Local Rights Association, in the hall of the club, Rose-street, Soho, to consider the question of unsanitary dwellings, and hear a statement of the objects of the association. Mr. Alfred Byrnes presided. Mr. Edwin Dunn explained that the association had its origin in an attempt by a few working men to do something to prevent their fellow-beings growing up in the wretched condition in which they were constantly found in the quarters inhabited by the working classes. They found the Artisans and Labourers' Dwellings Acts almost a dead letter or worse, because their working caused increased miseries to the parties they were meant to benefit. They had set about exposing some of the worst cases, and pointing out what they considered a remedy, viz, that the authorities should themselves build houses for the people, and let them to the labouring classes only at the lowest rental consistent with a fair return for money expended. Exorbitant rents were the curse of the working classes, and it drove working people into the lowest slums. The association also sought the abolition of distraint for rent, with a substitution of the County Court process. Those objects, he believed, entitled them to support. Mr. Beattie, Mr. Tranmere, and Mr. Lords, also addressed the meeting, and a resolution expressing approval of its objects was unanimously carried.

Dr. George C. M. Birdwood, C.S.I., of the Indian Museum, upon whom it is stated her Majesty has been graciously pleased to confer the honour of knighthood, is the second son of General Christopher Birdwood, of the Bombay Army, and was born in 1832. After serving for many years on the Bombay Medical Staff, he was appointed special assistant in the Revenue, Statistics, and Commercial Department of the India Office, where he has had special charge of the Indian Museum, and has rendered valuable assistance in examining and reporting upon the stores of Indian curiosities and works of art contained therein. He has also written a hand-book on Indian industries, and has commented largely upon Indian literature and philology.

Proposed International Exhibition at Manchester in 1882.—A proposition for the holding of an international exhibition at Manchester in 1882 has been mooted. It is suggested that the interval of twenty years since the last great exhibition of arts and industry in London is long enough for such changes and progress to have been made as must justify an exposition of them in England, and that Manchester might fairly be the place for it, as being the centre of a more populous district than any other,—a district with greater variety of productions and manufactures than any other, and easy of access by way of Liverpool to the most distant parts of the world.

Statistics of Wesleyan Chapel Building. The minutes of the 138th annual conference of the British Wesleyan Church, recently held in Liverpool, have been issued. From them we learn that erections have been sanctioned as under:—94 churches, at an estimated cost of 161,963*l.*; 9 manses, at 7,695*l.*; 10 school-rooms, at 4,531*l.*; 83 alterations and enlargements, at 41,563*l.*; 99 modifications, at 35,975*l.*; 26 organs, at 7,549*l.* The following erections have been completed during the year:—141 churches, costing 229,912*l.*; 13 manses, 13,205*l.*; 26 school-rooms, 12,324*l.*; 89 alterations and enlargements, 55,687*l.*; 14 organs, 5,326*l.*

Kendal.—It is proposed to reseat and decorate the Unitarian Chapel, Kendal. The ceiling will be panelled and ornamented in plaster, the seats will be of pitch-pine. There is also to be a new organ. The cost of the works, including organ, will be about 1,000*l.* Mr. Eli Cox is the architect.

Liquid Chinese Ink.—We have received a bottle of Wolff & Son's Liquid Chinese Ink. It appears to work well, and does not wash up when once dry. Whether it would retain this quality when stale would have to be seen. For pen-and-ink drawing the liquid ink is obviously convenient.

Readle's Glazing.—By some unaccountable accident in the composing-room, the Citadel Station at Carlisle, represented in Messrs. Readle & Co.'s advertisement last week, and which is glazed on Readle's Patent System, is described as at Glasgow. It is rightly allocated in the paragraph we gave in the same number announcing the lamented death of the patentee, but we think it right to point out the slip. The work is an important one.

Unsafe Letter-Boxes.—The *Northampton Herald* records a bank robbery by children at Wellingborough. It seems that on a recent Sunday morning, two little boys named Walter Weaver and Frank Blunt, both under seven years of age, were playing against the Union Bank, in Market-street. One of them put his arm down the Bank letter-box, and reached out a letter containing 1,400*l.* in cheques, which had been paid in at Northampton on Saturday, and were of no value to anybody except the Banking Company. The young urchins then proceeded to give away the cheques, putting some under shop-doors, and otherwise distributing them. Sometime on the Monday the matter came to the ears of the police, and the delinquents were questioned, and inquiries made about the missing cheques, and most of them were speedily recovered. The building has been erected about a year. Unless we are mistaken, Messrs. Hart, Son, Peard, & Co., a few years since introduced a patent letter-box ("Shove's patent," we think it was called) intended to prevent the abstraction of letters. The incident mentioned by the Northampton paper shows the importance of attending to what is apparently a small detail in a building. Where it is necessary to make the slit or entrance to the letter-box large and wide, for the admission of newspapers and book-packets, the box should be made sufficiently large and deep as to place its contents beyond the reach of pilfering fingers.

"Dover Priory Gateway."—With reference to the paragraph in our last, thus headed, we have received a letter from a solicitor, on the part of the gentleman who has, it is said, hitherto acted as architect for the college, stating that it "reflects upon him in his profession," and demanding an apology for its insertion. Having committed no fault we can scarcely apologise, but we shall be very sorry indeed if the paragraph be misunderstood. There was no intention to "reflect," in the slightest degree, upon any one. The sole intention of the paragraph, hastily written at the last moment, was to decline entering into a discussion, concerning the merits of which we know literally nothing. Expediency, mere personal preference, in fact any one of half a dozen reasons, none of them reflecting on the professional character of the local architect, might be quoted by the Council as sufficient to justify them in changing, and it was to such as these we referred. At the same time, for anything we know, the Council may be utterly in the wrong.

What might have been expected.—The *Times* of the 9th inst. describes an accident which occurred on the previous day at Yarmouth to a youth named Sidney Plucknett, in the employment of Mr. Salter, contractor. The head of the smith department was cleaning an ordinary iron oil-drum, and placed it, containing some water tightly corked down with a wooden plug, on the forge fire, with instructions to Plucknett to make it boil. The generated steam having no escape, a terrific explosion resulted, which wrecked the shop and threw the boiling water over the youth's chest and face, inflicting severe injuries, from which he died in three hours.

Bunhill-row.—Great changes are taking place in this locality. Nearly all the dwellings on the right hand side as far as the church of St. Paul are being demolished, the leases having fallen in. The ground has been let upon a building lease to Mr. Walker, of Bunhill-row, by the Hon. Artillery Company.

At the Royal Manchester and Liverpool Agricultural Society's Show, held at Blackburn on the 1st, 2nd, and 3rd of September, Messrs. W. H. Bailey & Co., of the Albion Works, Salford, exhibited their slow-combustion hot-air engine, and obtained the first-class silver medal for its excellence.

Glasgow Institute of Fine Arts.—The galleries of this Institute in Sauchiehall-street are now open with an exhibition of works in Black and White (1,127 in number), in addition to the works exhibited by the Scottish Society of Painters in Water-Colours. Both departments of the exhibition are well worth visiting.

Cost of the National Museum, Amsterdam.—The amount of the various contracts given in our account of this building (p. 295, *ante*), was in guilders (1*s.* 8*d.*), not francs, as we were informed and stated.

An Exhibition of Irish Industries is proposed to be held in Dublin next year. The promoters feel assured of success, and the guarantee fund is assuming large dimensions.

Scarborough.—New "Barracks" (by which they mean a chapel or meeting-house) are being erected here for the body known as the "Salvation Army," and the foundation-stones were laid on the 30th of August. The "barracks" will occupy a site at the junction of Almaparade and Victoria-road, and are intended to accommodate 2,000 "soldiers," in other words, a congregation of 2,000 persons, men, women, and children.

Margate.—The Roman Catholic Church of St. Vincent, in the Victoria-road, Margate, was recently reopened. From the designs of Messrs. Pugin a new pitch-pine roof has been added to the church by Messrs. Brown & Son, and the sanctuary,—indeed, the whole church,—has been re-decorated, the cost being 300*l.*

The Arts' Association Exhibition, Newcastle.—Of the 774 pictures and drawings exhibited this year, nearly 200 are by local artists. Taking into account that no one can send more than three works, this represents a large number of exhibitors.

Trade Unions Congress.—The Congress of Delegates was opened on Monday last in St. Andrew's Hall, Newman-street, Oxford-street. Many topics have been dealt with, and shall have our attention next week.

Wandsworth Public Hall.—The right title of the firm who supplied and fixed the heating apparatus here is "The Thames Bank Iron Company."

TENDERS

For the erection of shops and premises, North Cross-street, Gosport, for Mr. Bishop. Mr. Jas. W. Stroud, architect. Quantities by Mr. C. M. Houghton:—

F. Harding	£1,671	0	0
T. B. Hayter	1,650	0	0
J. Burt	1,620	0	0
C. M. Dash	1,564	0	0
G. J. Cole	1,499	0	0
W. Rapley	1,435	0	0
R. Taylor (accepted)	1,233	0	0

For new counter, &c., at the Prince's Head, York-road, Battersea, for Mr. Ewington. Mr. H. J. Newton, architect:—

Davidson	£287	19	6
Warne	283	10	0
Kemble	278	15	0
Helmigs	268	0	0
Heath	253	0	0
Matthews (accepted)	205	6	0
New Cabinet and Bar Fittings.			
Beale	£483	10	0
Lascelles	579	0	0
Taylor	498	0	0
Gill	487	0	0
Simpson (accepted)	430	0	0

For Industrial Dwellings, Alsop's-place, Old Gravel-lane. Mr. E. Hoole, architect:—

Jackson & Todd	£824	0	0
Holloway	795	0	0
Kirby	783	0	0
W. Smith	781	0	0
Lathey, Bros. (accepted)	707	0	0

For additions and alterations to St. Andrew's House, Regent's Park. Mr. Arthur Vernon, architect. Quantities by Mr. Walter L. Vernon:—

Bird	£5,498	0	0
Wagstaff & Son	5,121	0	0
Holland & Hannen (accepted)	4,976	0	0
Perkins	4,690	0	0

For pulling down and re-building Nos. 37 and 38, Margaret-street. Mr. A. E. Hughes, architect. Quantities by Messrs. Sandell & Corderay:—

		Time.
Downs	£6,310	9 months.
Higgs	6,294	9 ,,
Williams & Sons	6,174	9 ,,
Hewitt	6,173	—
Higgs & Hill	6,150	—
Simpson	6,000	12 ,,
McLachlan & Sons	5,880	9 ,,
Manley	5,677	12 ,,

For alterations and additions to "Redland Bank," Bristol, for Mr. Alfred Ball. Mr. Herbert J. Jones, architect:—

Contract No. 1.			
Lewis & Sons	£937	0	0
E. & T. Hatherley	893	0	0
Humphreys	879	0	0
Church	649	0	0
Supplementary Contracts.			
Church	348	10	0
Decorations.			
Edkins & Sons	250	0	0

For a pair of semi-detached residences, Randall-road, Clifton, for Mr. J. S. Strong. Mr. Herbert J. Jones, architect:—

Hannam & Wilkinson	£1,030	0	0

For erecting a new tun-room for Messrs. Mackison & Co., at their Brewery, Hythe, Kent. Messrs. Scamell & Colyer, architects. Quantities by Messrs. Curtis & Sons:

Contract No. 1.			
W. Tongue, Plumstead	£1,729	0	0
Morter, Stratford	1,710	0	0
Kirk & Randle, Woolwich	1,695	0	0
J. Brown, London	1,662	0	0
W. J. Adcock, Dover	1,488	0	0

For Carlisle Grammar School. Messrs. Hetherington & Oliver, architects:—

Excavator, Mason, and Bricklayer's Work.			
John Hutton	£5,982	0	0
Jos. Irving	5,863	1	0
J. & R. Laing	5,700	0	0
C. & J. Armstrong	4,800	0	0
Jas. Metcalfe	4,800	0	0
Beaty, Bros. (accepted)	4,591	13	4
Carpenter and Joiner's Work.			
Batey & Forster	£3,448	0	0
G. Black	3,303	0	0
W. & H. Davidson	3,200	11	0
Wm. Court	2,998	0	0
Jas. Wright	2,875	0	0
Court, Bros. (accepted)	2,748	12	3
John Reed	2,694	17	0

For rebuilding portions of Yoroshi House, Woolwich, for the trustees of Captain Skinner, R.A. Mr. Walter Graves, architect:—

Ward & Lamble (accepted)	£333	0	0

For pair of semi-detached dwellings, exclusive of foundation work, Finchley-road, N.W., for Mr. David Tildesley. Mr. Walter Graves, architect. Quantities by Mr. Barnett:—

C. Kellond (accepted)	£2,900	0	0

For alterations and new pitch pine seats for the Committee of the Welsh Baptist Chapel, at the Frankland Hall, Castle-street, Oxford-street. Mr. Owen Lewis architect:—

W. J. Beales	£297	0	0
Galsey	294	0	0
Lawrence	288	12	0
Bowden	233	10	0
Blandford & Co.	220	0	0
Lewis	209	10	0
Norris	179	10	0

For the erection of a residence, &c., Ascot, Berkshire, for Mr. G. Cawston. Mr. Arthur Cawston, architect:—

J. & C. Bowyer	£4,241	0	0
Patrick & Son	4,158	0	0
Rider & Son (accepted conditionally)	3,998	0	0
Colls & Co.* (withdrawn)	3,498	0	0

* Offered again at £3,899, but refused.

For building public-house, Trafalgar-road, Gorleston, Great Yarmouth, for Messrs. Steward, Patterson, Finch, & Co. Mr. J. Wm. Cockrill, architect:—

Springall, Great Yarmouth	£712	0	0
T. Howes, Great Yarmouth	709	0	0
Norfor, Southtown	674	0	0
Bray, Great Yarmouth	647	0	0
Want, Great Yarmouth	639	0	0
Rans & Cooper, Great Yarmouth	630	0	0
Poxon, Great Yarmouth	626	0	0
Fuller, Gorleston	626	0	0
Beech & Cork, Great Yarmouth	624	0	0

For building three cottages, at Belton, Great Yarmouth, for Mr. Jas. Guyton. Mr. Jas Wm Cockrill, architect:—

Newman, Southtown	£394	10	0
Burgess, Burgh Castle	390	0	0
Bray, Yarmouth	386	0	0
Fuller, Gorleston	330	0	0
Poxon, Yarmouth	325	0	0

For new road and sewers on the Fulham No. 2 Estate, for Mr. G. E. Holland:—

Dunmore	£445	0	0
Jackson	444	0	0
Pizzey	424	0	0
Wilson	413	0	0
Keeble	369	0	0
Harris (accepted)	320	0	0

For additions and reparations to school buildings and master's house, Shalford, Surrey, for the Shalford School Board. Messrs. Peak, Lunn, & Peak, architects. Quantities supplied:—

	School.			Master's House.		
G. Strudwick, Guildford	£924	10	0	£36	10	0
Martin, Wells, & Co., Aldershot	904	10	0	62	0	0
R. Pink, Milford	887	17	0	44	15	0
Whitburn, Shalford	879	12	2	39	9	6
S. Fowler, Woking	807	0	0	29	0	0
R. Peat, Redhill	754	10	0	32	0	0
W. Smith & Sons, Guildford	718	14	0	29	5	0
Mitchell, Bros., Shalford	650	0	0	22	19	0
Unsigned Tender	530	0	0	40	0	0

* Accepted subject to approval of Education Department.

For re-making, draining, and widening, &c., the Jenner-road, Guildford. Mr. H. Peak, surveyor:—

Martin, Wells, & Co.,* Aldershot	£502	3	0

* Accepted.

For the erection of a gatekeeper's lodge, at Eton, Witley, Surrey, for Mr. F. E. Eastwood, J.P. Messrs. Peak, Lunn, & Peak, architects. Quantities supplied:—

Martin Wells & Co.,* Aldershot and London	£325	7	8

* Accepted.

For proposed tavern and restaurant, Temple-street, Whitefriars, for Mr. John Finley. Mr. F. Adams Smith, architect. Quantities by Mr. S. B. Wilson:—

		If Box-ground stone, allow
Higgs & Hill	£6,200	£136
G. S. S. Williams & Son	6,100	250
Wm. Brass	5,979	195
Hall, Beddall, & Co.	5,847	197
Mark Patrick & Son	5,672	200
Ashby, Bros	5,621	195
Richard Conder	5,229	232
Thos. Rider & Son (too late)	5,821	198

For forming roads and paths, and laying in drains, on the Southend-on-Sea Estate, for the National Liberal Land Company (Limited). Mr. George Pooley, surveyor:—

W. Steward	£635	14	9
Wm. Speakslow	615	14	6
Jas. Bloomfield (accepted)	£11	0	0

For storage reservoir, Tunbridge Wells:—

General Works.

W. Webster, London	£7,074	13	4
W. J. Botterill, London	26,231	0	0
T. B. Hayter, Portsmouth	24,177	9	10
Ball & Gammon, Gillingham	23,874	12	10
Paramor & Sons, Margate	23,774	3	6
W. Hill & Co., Gosport	21,329	3	0
G. Punnett & Sons, Tonbridge	20,539	18	9
G. Smith & Co., Southport	19,877	17	11
J. Dickson, Sevenoaks	19,681	4	11
Chamberlain, Littlehampton	19,354	10	1
C. Dickenson, London	19,049	4	11
F. Nowell, London	18,293	11	6
G. Stevenson, Eckington	17,553	5	9
E. J. Strange & Sons, Tunbridge Wells	17,277	2	10
Fawkes, Bros., Southport	17,031	0	1½
H. Potter (accepted), London	16,925	14	5!

Asphalte Lining.

Claridge's Patent Asphalte Co., London	£10,704	17	8
L. Stiebel, London	8,865	8	0
F. Nowell, London	8,302	15	0
The Limmer Co., London	7,921	17	0
Val de Travers Co., London	7,428	15	9
H. Lockwood, Manchester	6,564	1	9
S. Davis, Manchester	6,120	8	6
Société Française, London	5,920	18	0
H. Meison, Birmingham	5,417	2	0
Green & Co., Portsmouth	5,376	12	6
Fawkes, Bros., Southport	5,347	14	9
L. M. Lowe, Farnworth	5,208	2	6
Bradshaw & Co. (accepted), London	5,018	9	7
J. Harrison & Co., London	4,207	2	6

For Local Board Offices, residence, and stables, Sevenoaks, Kent. Mr. G. W. Brumell, architect. Quantities by Mr. T. Potter:—

Tomsett, Tunbridge Wells	£2,143	19	5
John Boase, Greatness, Sevenoaks	1,925	8	0
W. J. Botterill, London	1,865	0	0
Bottoms, Bros., Battersea	1,861	0	0
Enoch Julian & Co., London	1,730	0	0
J. Adcock, Dover	1,698	19	6
H. Owen, Sevenoaks	1,694	0	0
Jones & Co., Gloucester	1,644	0	0
T. Higgs, Loughborough Junction	1,677	0	0
R. Durtnall, Brasted	1,665	0	0
J. Bingham, Headcorn	1,658	0	0
W. Wright, Chelsfield	1,650	0	0
W. Wiltshire, Sevenoaks	1,650	0	0
W. J. Basle, Battersea	1,614	10	0
Williombe & Oakley, Tunbridge Wells	1,600	0	0
Jno. Morris, East Grinstead	1,588	0	0
C. King, Sevenoaks	1,570	0	0
F. Warr, Croydon	1,124	0	0

For the erection of a new school for 160 children, at Wenhaston, near Halesworth; boundary-wall, &c. Messrs. N. Peels & Son, architects. Quantities supplied:—

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Holsworth & Son, Bungay	1,450	0	0
Hindes, Beccles	1,438	0	0
A. Coe, Ipswich	1,429	0	0
Smyth & Son, Aldeborough	1,398	0	0
Marsden, Bramfield	1,367	7	0
Allen, Southwold	1,340	0	0
Ludkin & Son, Banham	1,325	0	0
Watson, Bungay	1,323	0	0
Calver, Rungli-ld	1,289	0	0
Carter & Son, Saxmundham	1,271	12	8
Dunn, Beccles	1,265	0	0
Gibbs & Son, Yoxford	1,245	0	0
Gladwell (accepted), Ipswich	1,199	10	0

For the decoration of St. Margaret's Church, Tyler's-green, Penn, Bucks, for Sir Philip Rose, bart. Mr. Henry G. Liley, architect:—

Liley & Wood (accepted).

For alterations, additions, and decoration, to 1, Cromwell-road, South Kensington, for Sir Philip Rose, bart. Mr. Henry G. Liley, architect:—

Liley & Wood (accepted).

For warming and ventilating, by their new hydro-caloric apparatus, the new Congregational Schools and Lecture-hall, East-hill, Wandsworth. Mr. E. W. Mountford, architect:—

J. Weekes & Co., Chelsea	£102	0	0

For road-making and laying of sewers, Enfield. Mr. Ernest Howard, surveyor:—

T. Rowley	£2,420	0	0!
W. Harris	2,300	0	0
Beadle & Co.	2,280	0	0
Ford & Everett	2,240	0	0
G. Aldred	2,229	0	0
G. Pound	2,048	0	0
Taylor	1,992	0	0
Taylor & Co. (accepted)	1,855	0	0
Pugh & Co.	1,648	0	0
H. Woodham	1,599	0	0
J. Ball	1,410	0	0!

For the erection of house, &c., at Hatton-garden, for Messrs. Reid & Co. Mr. Ansell, architect:—

Patman & Fotheringham	£2,750	0	0
Laurence	2,477	0	0
Anley	2,320	0	0
Godden	2,310	0	0
Macey & Son	2,253	0	0
Cox	2,248	0	0
Jay	2,150	0	0
Langmead & Way (accepted)	2,150	0	0

For rebuilding 36 and 37, Brewer-street, Soho, for Mr. Rentoul. Mr. W. Cubitt Nichols, architect. Mr. H. P. Foster, surveyor:—

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Bywater	2,050	0	0
Ansell	1,999	0	0
Couder	1,881	0	0
Langmead & Way	1,812	0	0

For taking off old and constructing new roof, and other alterations, at Wesleyan Chapel, Mansfield-road, Nottingham. Messrs. S. Dutton Walker & Howitt, architects:—

Contract No. 1.

Lynam (accepted)	£1,300	0	0

Contract No. 2.

For new entrances, porch, &c., to the same building:			
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Clarke	444	0	0
Lynam	434	0	0
Scott	433	0	0
Bell & Son (accepted), Nottingham	415	0	0

TO CORRESPONDENTS.

Constant Reader (we cannot give addresses).—H. G. L. (should have sent list of names and sum total).—J. D. (we cannot speak of scheme of which we know nothing).—C. R. (no; the Hungerford Bridge was erected without any reference to Clifton, and was taken there afterwards).—G. P.—B. & Co.—J. E. L.—P. A.—E. H.—W. C. T.—G. F. B.—H. J. N.—A. V.—W. C.—P. H. J. J. D.—B. L.—L. & W.—H. & Co.—C. M. H.—W. H. P.—W. P. B.—J. D.—O. W. B.—J. O.—W. F. S.—P. Bros.—C. M.—E. C.—W. H. P.—W. M.—W. G.—F. & F. A. S.—H. & O.—O. L.—H. H.—J.—A. E.—C. & son.—H. P.—T. R.—H. B. M.—D. W.—E. C.—H. J. J.—E. O.—J. H. S.—J. S. H.—O. K. (no).—J. B. shall have attention!

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The Word "Nature" in Reference to Art.

CORRESPONDENT recently drew attention in our columns, not without reason, to the confusion of thought arising from the varying senses in which the word "nature" was used in art-criticism. Another correspondent, Mr. J. K. Colling, in a letter printed in a previous number, took some exception to our criticism of his introduction to a book on design, in which we suggested that he had pushed too far the statement that all ornament must be founded on geometrical forms. In his letter Mr. Colling said that such forms were based upon nature, and that "all mathematics and geometry are closely allied to laws which exist in nature."

It was to this sentence especially that our second correspondent, Mr. Cave Thomas, took exception, and thereupon demanded that people should settle what they mean by "nature" when they refer to it as the basis of art. Without going so far as to say that no discussion on any artistic topic is of any value until people have settled what they mean by "nature," we must at least say that the word has been used with great laxity and vagueness as to its meaning, and that our correspondent did usefully in calling attention to the point, even though, as it appears to us, he showed that he himself was under a certain confusion, if not of perception, at least of expression, in regard to it, though by no means so much so as the first correspondent whose expression he criticised. To say that mathematics and geometry "are closely allied to laws which exist in nature," is, in fact, a most extraordinary confusion of terms; Mr. Colling may pardon us for saying so, since it has been his business to express himself with the pencil rather than with the pen, and we do not take his laxity of literary expression as in any way invalidating the value of his artistic taste, feeling, and draughtsmanship. Taking the word "nature" in the widest sense, mathematical and geometrical facts are not merely "allied to" nature, they are the expressions of laws which exist in nature. But Mr. Colling did not mean to use the word "nature" in its widest sense. What his sentence evidently meant, if it had been less vaguely expressed, was that the relations between lines and surfaces which exist in geometry and are demonstrable by mathematics, are frequently illustrated in the facts of external nature; the word "nature" being here used as expressing the aggregate of the external forms of nature, organic and inorganic.

The confusion of idea, and it is one which we admit is constantly recurring, is between outward forms of natural production, and what are regarded as principles or laws governing everything in nature, and among other things governing, more or less, the formation of vegetable growths, which are the basis of a large proportion of ornamental design. In fact, if we closely examine the point, we shall see that the one word "nature" is used in three different meanings when nature is spoken of as the basis of art. We may say that the disposition of lines and spaces is pleasing in proportion as they adhere to certain geometrical forms which have their basis in natural law. That is one use of the term, and that refers entirely to abstract laws which are capable of demonstration by pure theory and apart from any artistic representation at all. We may say, again, it is a law of nature that trees and plants should give forth branches at nearly regular intervals and at different sides of the central stem in succession; that is a fact referring to the mechanism of the plant, and also capable of statement without artistic illustration, but it is not, like the previous class, a law affecting all our conceptions of spaces and proportions in whatever material; it is a fact habitual to a certain class of natural growths. Then the third sense is when we see a drawing, say of a leaf, supposed to represent a specified leaf in nature, and we say "that is not correct, not according to nature, the natural shape is this," and then comes in the aid of the pencil, without which in this case we cannot make ourselves intelligible. This third use of the word refers to isolated facts and forms in nature, which we are supposed to be imitating, so that here the connexion between "nature" and "art" is the most obvious and immediate of all.

Now it is hardly possible in this case to settle what we mean by "nature," that is, to attach the word to one only of those meanings, unless we are willing to leave the other meanings without a word to express them, or else to agree to the use of some modifying expression which will indicate in what sense we mean to refer to nature. Now it appears to us that this modifying expression may be supplied by two words, one of which has got a rather bad name through being constantly used in reference to what are supposed to be vague and dreamy speculations; but which are in reality perfectly logical and intelligible expressions, calculated, when rightly used, to save a great many words and a great deal of misunderstanding (we mean "misunderstanding" in the direct, not in the secondary sense). These are the expressions "physical" and "metaphysical," of which the former of course is nearly the Greek equivalent of "natural," — entirely the equivalent in its accepted meaning; and the latter is one of those convenient combinations which the pliant Greek language was so well able to frame to express a complicated meaning in one word. If we were to invent a corresponding expression to go with our word "nature," we should say that "natural" and "sub-natural" would be the equivalents; but we do not think that good fortune attends upon attempts deliberately made to invent new words. Going back to the old Greek compounds, therefore, which have long been adopted into our language, we know that the simple word "φύσις" is the equivalent of "nature," external nature, the garment of the world; physical is "natural," physical facts are facts in nature, physical laws are laws of nature, —outward visible nature, be it observed. Then that which is metaphysical is—what? That which is behind nature, that which we come to when we endeavour to penetrate below the physical facts to any laws or what we may call in one sense facts which are not physical, but are capable of demonstration quite apart from external nature. To give one illustration, it is a physical fact that bees make their cells hexagon shape; it is a metaphysical fact that the hexagon shape allows of contact on all sides without any loss of space; *meta*physical, because that property or capability of hexagons would be the same in any material and under any circumstances, and would equally exist if all external nature were swept away, and would be capable of demonstration in figures without any reference to external nature at all.

Let us see how this applies to the subject in hand. It is asserted by the advocates of symmetrical and geometrical arrangement in ornamental design, that such arrangement largely, if not entirely, pervades "nature," by which term some of them mean apparently that geometrical symmetry is based on natural laws, and that, therefore, geometrical ornament is "founded on nature"; others assert that a minute inspection of nature will reveal a constant or almost universal presence of geometrical and symmetrical forms. Among the upholders of this latter view was Owen Jones, who, to our thinking, greatly overstated his position. Nor can we accept Mr. Cave Thomas's way of putting it in his letter in the *Builder* of the 3rd inst., that "regularity and irregularity are two extremes, between which nature, art included, is always striving to steer a middle course." That is a very empirical way of stating the case. Our belief is that all symmetry in the organic forms of nature is mechanical in its origin; that it occurs or originates at least where there is some advantage to the organism to be gained by it. Take the spiral growth of trees and plants, which put out their shoots at opposite sides alternately. A tree which put out all its branches at one side would be under the double disadvantage of being liable to be pulled over on that side by its weight, and of breathing the air from one quarter only instead of from all sides. Animals are bi-symmetrical because this formation is necessary to their balance and to the alternate

movement required for progression, and in their case a considerable exactitude of symmetrical arrangement is necessary to their comfortable existence. Leaves are bi-symmetrical mostly, apparently, because this is the best way of securing equal radiation of sap from the central stalk; but their symmetry has much more latitude than in the case of animals, as has that of the whole plant also, in the great majority of species. Anything like absolutely geometrical symmetry is, in fact, the exception in the forms of the vegetable kingdom, and in the animal kingdom even is only to be found in the main disposition, not in the details. The hands are symmetrically disposed; but the hand itself is quite unsymmetrical. Almost the only instances of absolute geometrical symmetry in nature are in some inorganic products, such as snow crystals, and these are in quite a different category. These do not, as far as we understand them, arise from any such "survival of the fittest," as that which we may suppose to have developed the symmetrical growth of plants on either side of a centre; they are simply the results of all-pervading laws of arrangement and balance of matter, acting upon very impressible and fragile materials, and kneading them into shapes accordingly. They are the effect of a law of nature, in the same sense that the circular ripples from the splash of a stone in water are the effect of a law, with the difference that the latter effect, in a fluid material, is evanescent; the former is durable.

Those, then, who defend symmetry in ornament on the ground of the existence of symmetry in physical organic forms, rest on a false footing. Such symmetry as we exhibit in designing symmetrical ornament has very little existence in nature. The true meaning of symmetrical ornament, exhibiting or founded on natural forms, more or less conventionalised, is that, in designing it, we take details from physical forms, and combine them in subordination to broader metaphysical laws, or perhaps only to a broader and more typical reading of the physical law. The physical law that plants should sprout on alternate sides of the stem, for example, may be generalised into a form representing the completely symmetrical giving off of lines on either side of a centre, expressing the general idea of the plant growth, although the same mathematical symmetry would not be found in any individual plant. In this case, from the physical fact, we generalise metaphysically to an artistic expression of the principle.

When we come, therefore, to the question whether ornament ought to be symmetrical or not, it is not so much a question of what is according to nature or not, as of the way in which you choose to use nature, and the view which you take as to the object of your design. Taking the question which gave rise to the letters that suggested these remarks, as to how far we should recognise or approve the unsymmetrical ornament of the Japanese, we have no hesitation in saying that much of the more symmetrical ornament of Classic, Arabian, and Mediæval times, is a higher stamp of work, because more thought goes to the production of it, —that it is a treatment of forms based on physical facts in accordance with the application of metaphysical laws or ideas; whereas the Japanese is simply the imitation of the natural facts without the application to their treatment of any higher law. We suspect the fact is that to the Japanese artist, what we call his ornamental design is not, in his mind, ornament at all, in the sense in which we use the word, but painting from nature; an art which, it is needless to say, stands on quite a different ground from ornamental design. In some other forms of ornamental design, which have by one writer been called "abstract ornament," such as the Greek fret, and the Arabic interlacing patterns, the basis of the design is purely metaphysical, that is, it is a kind of playing with geometrical laws and proportions, which are quite apart from external nature, and weaving a kind of physical growth of our own designing on the basis of them. Just as there are three ways of regarding nature as the basis of ornamental design, so there may be said to be three methods of producing ornamental design; that in which we follow laws of pure geometric proportion, and illustrate them in a more or less playful way; that in which we adopt physical forms, but subject them to metaphysical laws in grouping and arrangement; and that in which we simply reproduce physical forms. Of this latter, of which, of course, the greater part of Japanese ornament is an illustration, it is an open question, strictly speaking, whether it ought to be called ornament at all, and whether it was ever intended so, in one sense, by its producers: but it is at present called so.

When, therefore, to conclude, any one raises the question whether ornament should be an imitation of nature or not, or whether such-and-such features in it are in accordance with nature or not, what we have to do, before it is any use arguing further with him, is to elicit from him whether he means according to *metaphysical laws* of nature, or *physical laws*, or *physical facts*. That is the essence of the question he has to answer. If any one can suggest a better nomenclature to put it in we shall be very glad to hear it.

A TIDAL PORT FOR LONDON.

IT was a not unusual remark, some thirty or forty years ago, that the Thames was the finest dock in England. Indeed, a strong, if blind, patriotism often went so far as to call it the finest dock in the world. The remark showed, indeed, that the man who made it had never seen Milford Haven, Falmouth, or Cork Harbour. But the fact that the shelter and facility which the Thames affords for shipping have been the making of London is beyond doubt. And if the words "the most frequented port" were substituted for those which we have quoted, there could be no ground to quarrel with their exactitude.

With the immense growth of the steam navy of the world, a growth not only in the numbers but in the size of the vessels, the disadvantages of berthing in a tide way, instead of steaming into a tidal dock, are becoming year by year more apparent. And, notwithstanding the growth of those noble docks that already line the banks of the Thames, there is still much to be desired in the way of providing a port into which vessels may enter, and from which they may depart, at any hour of the day, or at all events at each flood tide. Even the most capacious of the docks now existing alongside of the Thames are inadequate for the reception of the largest steamers now afloat. There is no dock, it is stated, into which the *Orient*, the *City of Rome*, or other steamers of the same class, can at present enter. And even vessels of somewhat less draught cannot be docked in a single tide; as by the time the ship comes up from the sea in the twelve hours for which the tide serves, the water has sunk to too low a level to float the vessel over the cill of the dock. Thus twelve or even twenty-four hours are lost, as great ships invariably anchor off Gravesend for twelve hours to await the following tide.

On entering the river Thames, the broad open channel called Sea Reach runs for ten miles nearly due west, after passing Yantlet Creek. It then bends to the south, the bend forming Lower Hope Reach, which is about four miles long, or from three to three and a half in the fair way of the channel; and then again runs westward for about five miles, through Gravesend Reach. About the middle of this reach lies the town of Gravesend on the south, and Tilbury Fort on the north of the river. It is here that the principal ocean-carrying companies now for the most part embark and disembark their passengers, communication with London being kept up by the North Kent Railway on the right bank of the river, and by the London, Tilbury, and Southend Railway on the left bank. From Yantlet Creek to London Bridge is forty-one miles by the river; and it is forty-eight miles from the Great Nore, below the junction of the Medway, to the Bridge. Gravesend is by river twenty-seven miles from London Bridge, through which distance the course of the river is tortuous, with lessening depth and narrowing width. And such is the peculiar character of the river, and such the force of the winds, tides, and currents, that low water in London is sometimes actually lower than low water at Sheerness. On the 24th December, 1877, it is stated by Mr. Redman, C.E., to whom the Thames has long been a subject of attentive study, the low water at London was 4 ft. 4 in. lower than at Sheerness. The depth of water between Tilbury and Gravesend is from 40 ft. to 50 ft. at low water. The range of the tide is from 16 ft. 10 in. to 17 ft. 6 in. at Sheerness, and from 20 ft. to 22 ft. at London.

The directors of the East and West India Docks have now purchased an area of 450 acres on the left bank of the river Thames at Tilbury End, opposite Gravesend, with the purpose of there constructing great docks, capable of receiving the largest vessels now built at any time of the tide. A tidal basin of sixteen acres in extent, and 40 ft. deep, will open by an entrance 200 ft. wide into the river. From this basin access will be given to the docks by a lock of 700 ft. long, with a depth of 40 ft. water on the cill. The floating docks are to have a quayage of 15,000 ft., allowing working berths to thirty steamers of 400 ft. each in length. There is to be a dry dock of 825 ft. in length, as well as others of less colossal proportions. All modern appliances (in which the Americans are probably far ahead of ourselves), in the way of elevators, coaling lifts, and the like, will be provided, with hydraulic power, such as we recently mentioned as applied to the new docks at Liverpool. Landing stages will be provided for the embarkation and disembarkation of passengers at any time of the tide. Pilotage, tugging, risk of fogs, risk of collisions, delay in warping up twenty miles of winding channel, will all be avoided by this opening of a new front door for the maritime commerce of London.

The one point which strikes us with wonder on comparing the outline of this project with the chart of the River Thames is,—"How is it that this scheme has not long ago been taken in hand?" Floating or wet docks were first introduced at Liverpool about the year 1716. They have since that time been introduced into almost all the principal ports of the kingdom. In the Thames the East and West India Docks were constructed by Jessop, Rennie, and Ralph Walker; the London Docks, by Rennie; the St. Katharine's Docks, by Telford. Much has been spent in providing the accommodation that now exists. Mr. Robert Stephenson and Mr. Bidder, when they commenced, almost at their own risk, the railway to Tilbury, must have had some not indistinct idea of the manner in which railway communication would react upon river communication, as regards the position of a sea-going station. The whole line of river shore from Stanford-le-Marsh to Coal House Point, and thence to Tilburyness, seems as if it had been especially provided by nature for the construction of floating docks. From any part of London it may be made as easy to get to Tilbury as it is now to get to Blackwall. The addition of some sixteen miles to the railway journey is as nothing when compared to the saving of from twelve to twenty-four hours in clearing the Thames after embarkation, and when we regard what is even more important than gain of time, namely, certain punctuality of departure, and, to an increased extent as compared with previous conditions, punctuality in arrival. The estimate which is mentioned of 1,100,000*l.* seems to us very inadequate to such an enterprise as is now foreshadowed, especially when we recall the sums expended on the docks at Liverpool. We trust that no false idea of economy may be allowed to mar the execution of a scheme which we take to be one of the most important, as well as one of the most promising, of which we have recently heard.

In saying this, however, we confine ourselves to the approval of the principle of the design, as far as concerns the construction of docks at Tilbury. As to the details, we are as yet unaware of more than we have previously stated. We should not feel called on even to make this reservation were it not for what seems to us the small sum named as the cost. Of course, if land enough be in the first place secured, it is possible to commence on a portion of a well-designed plan, which may be afterwards enlarged from time to time. And if we compare such few details as those given us with those which we published last week with regard to the new Alexandra Dock at Liverpool, it would seem as if the engineer of the Tilbury Docks was resolved that the Mersey shall not continue to beat the Thames in the facilities which it offers for commerce. The *avant-port*, or tidal basin, in the Liverpool system, has an area of 7 acres; that at Tilbury is to have 14 acres of water-surface. The depth of the former is to be 44 ft. at high-water; that of the latter, 40 ft. at low-water. The entrance of the Liverpool basin is 400 ft. wide, as compared with one of 200 ft. in the Thames. This, however, is a matter for the hydrographer to determine. The most appropriate width is a question that depends on many conditions, on position with reference to the river, on direction of winds, tides, and currents, and the like. The Mersey is a far more difficult river to enter

safely than the Thames, and we see no reason to doubt that a proper width for the entrance of the *avant-port* has been adopted in each case.

From a tidal basin the entrance into a system of docks is practicable in more ways than one. The point which the engineer has to keep in view is how to obtain the greatest length of berthage or quay wall with a given floating area, due provision being made for the passage of any vessel to or from its berth at any time without interfering with any other vessel. This problem, when netly put, is not one of extraordinary difficulty. In the Liverpool case there is an approach to its solution by what we may call a gridiron arrangement,—that is to say, by the construction of branch docks at right angles to the main dock. This arrangement possesses the advantage of greater concentration. The length of quay wall and of accompanying railway will be much the same, however it is disposed. But to go from a vessel in one dock to one in another will generally be far more easy when docks are arranged in parallel lines than when one great line of quay extends for a long distance. That, however, is a matter of detail. There is land enough at Tilbury, water enough in the Thames at that spot, money enough, and engineering skill enough, at the disposal of the great dock company. We do not doubt that the new Thames port will be a credit to its promoters and a great benefit to the trade of London.

SOME ASPECTS OF THE TRADE UNIONS CONGRESS.

THE first Congress of the Trade Unions held in London took place, as every one now knows, last week, and has naturally excited a good deal of public interest, even on the part of those who have no special reason for following with interest the progress and ideas of those who are called the working classes. The contrast between the position now held by Trade Unionism in public importance and in public estimation, and the cloud of indignation under which the movement first struggled into existence, is certainly very remarkable. So far has the movement been able to mould public opinion, that one journal, in commenting upon its present aspect, observed that to revive old stories of trade-union outrages would now seem as unjust and inappropriate as to remind people of the barbarous practices of their ancestors. There certainly is a remarkable elevation of tone observable in the actions and utterances of the trades unions,—or, as we prefer to phrase it, "trade unions,"—within a remarkably short space of time; though, recalling one or two of the flagrant instances of narrowmindedness and injustice to employers which we had occasion to comment very strongly upon not so very long since, we are hardly prepared to see things quite so favourably in this respect as our contemporary seemed able to see them. Still, we fully believe that the idea of violent measures, such as amount to what the French call *voies de fait*, is quite discountenanced by all who take a leading part in the action of trade unions at the present moment.

The ugly facts which characterised the birth of trade unionism were, indeed, attributable to the same kind of causes as those which have often led to cruelties and violence being committed in connexion with the assertion of liberty. The working-men in the principal trades had long been at the mercy of the capitalists, and had been treated in a great number of cases with a most arbitrary indifference to the good of any one but the capitalist, under whose power they practically lay; for if one workman or shopful of men refused the terms of the capitalist, he could always count on getting others who would accept them, and to be the first to rebel was to commit suicide. The movement in the direction of combination as a means of organised resistance to this oppression by capital arose therefore out of bitter feelings of revolt against injustice and oppression, and exhibited naturally the violence which might be expected when a body of men, including among their numbers not a few ill-educated and morose spirits, found themselves in possession of a new and formidable weapon with which to repay their former masters in kind. While holding still the opinion that much of the early history of trade unionism, in some quarters of England more especially, was marked by proceedings that were perfectly disgraceful, and concerning which there ought to be no two opinions, we entirely concur in the feeling that this unhappy phase of the movement should now no more be recalled on the one hand than it should be justified on the other. Whatever faults or shortcomings the trade unionism of to-day may have, whatever mistakes it may make, it is thoroughly respectable and respected, and appears desirous not only to do what is right, but even to appear as the promulgator of social theories and aims in advance of the average social morality of the day.

In this latter respect, however, we must be allowed to suggest that the attitude and tone of the trade unions, as represented at this recent Congress, are a little too magnificent. Putting together a number of expressions and sentiments which were uttered by various speakers, it would really seem as if the trade unions considered themselves as the salt of the earth, and as the only body of people in the country who were actuated by the loftiest and purest political and social motives. This tone of what may be called corporate self-congratulation on all the good that "we" have done and intend to do runs through the whole of the proceedings, from the condemnation of the whole bench of magistrates, paid and unpaid, and the suggestions for their wholesale amelioration, down to the superb tone of injured virtue in which some delegates supposed to represent Protectionist or "Fair-trade" interests were alluded to as those who had come there to do "the dirty despicable work of those who were opposed to the interests of trade unions," and "to bring disgrace upon the trade unions of the country," apparently by holding and expressing opinions about trade different from those held by the Congress. The obnoxious delegates, or some of them, appear to have been technically in the wrong as to their standing-ground in the Congress; but, beyond this, we do not gather that they evinced any crime except that of being Protectionists; and though we believe the revival of the Protection idea to be in the main a mistake, the matter is not by any means so simple a one as the trade unions appear to think, and it might in any case have been useful, if such questions are to be discussed by trade unions, to listen to what those on the opposite side have to say. At any rate, the use of such overcharged expressions as we have quoted is very undignified; and as far as we can judge by the reports in the newspapers, it would seem that the obnoxious and finally ejected delegates had the advantage of the virtuous majority in point of temper and forbearance; but we admit that it is difficult to form a just impression on such points from mere newspaper reports. With regard to the unwise and sweeping charges against the magistracy of the country, we observe that one delegate had the courage and common sense to say that he entirely differed from the majority, and to point out, moreover, that, even granting the charges made were well founded, the resolution proposed suggested no remedy.

There is another criticism which is unavoidably suggested by the prevalent tone of the Congress, and which the leaders of the trade unions should consider seriously. It is impossible to blink the fact that they are recommending for themselves some of the very methods which they condemn in other classes of society, and that while they complain of and make war on the evils of class feeling and class legislation on the part of others, they are continually and strongly asserting their own class feeling. They boast, one speaker did at least, that they had a power in their hands which would enable them to] break down any monopoly and any class interest existing. They may or may not overrate their power in this respect; but, putting that aside, how are they seeking to establish and consolidate this formidable power of which they boast? Simply by endeavouring to establish a monopoly of their own, a monopoly of labour. We do not say there is anything immoral in doing so; we may go farther and say that their form of monopoly is of a more honest and healthy type than some of those against which they contend, certainly far more so than such a monopoly as that which the ring of cotton speculators in Liverpool have been seeking to establish for their own benefit, and which was referred to at the Trade Unions Congress in terms which were not at all too strong, and with which we quite concur. But it is really absurd for people to assume this high and mighty tone against monopolies of every kind and in favour of free trade, when they are actually working in opposition to free trade in labour. Are they entirely blind to the fact, which is certainly patent to most people of understanding, that by their own action in forcing up wages and forcing down hours of labour, and curtailing the private advantages to be derived from individual superiority of talent among themselves, they have to some extent checked the outlay of capital in building operations, and sent some branches of labour largely into foreign hands? Again, the trade unions are eloquent against class privileges, yet the assertion of the rights and privileges of their own class, as a class, runs through the whole proceedings of this Congress, and almost its very last business was the reading, with evident approval, of a letter from a "committee of invitation" in Zurich urging their co-operation at an International Working Men's Conference, among the objects of which was "to arouse class feeling." Now, class feeling is one of the very evils which, in regard to all the rest of the world, they profess to desire to break down, and one which we on our part consider to be a very great obstacle to general progress and general good understanding between man and man. The abolition of the idea that working men are a separate class is one of the very objects which the wisest friends of the "working class" have in view, and which we really supposed was an object with the most intelligent and best educated of the working men themselves. And even if it were otherwise, where is the logical definition of the "working class"? Where does it begin and end, and what are its boundaries? No one can say. Among the members of a single trade or profession there may be legitimately and logically a kind of class feeling, which is better and more pleasantly expressed as *esprit de corps*, and is in most senses a natural and healthy spirit. But there is no real line of demarcation between "working classes" and the rest of the world, except the line which certainly may be drawn between those who do some work and those who do none at all, but live only for indolent pleasure. Apart from these, all of us belong to the "working classes," and the work of handicraftsmen is not more important to the world than many other forms of work, and if the craftsmen are told that it is, by injudicious and one-sided friends, they will do wisely not to believe such a gospel. The workman of one day becomes a "master" the next, and any capable and instructed artisan should feel that he carries in his basket the brass plate of the employer. What is curious in connexion with the subject, as considered in regard to this particular Congress, is that by a singular unconscious irony, the working men were commended, in a leading article in the *Times* in reference to the Congress, for having shown the world that they did not consider themselves a class apart; while the daily reports of the proceedings of the Congress, in the columns of the same journal, went directly to show the contrary.

We make these remarks in an entirely friendly spirit, and in what we believe to be the best interests of the trade unions, who would do wisely to consider carefully the ground which they are taking, and to content themselves with a more cosmopolitan, and, in some respects, less ambitious programme. At the outset of the movement the peculiarly class attitude which they adopted may have been necessary to break down the opposite interests of the capitalists, the relations between the two being at that time abnormal and unfair. But the ultimate object should be, not to set up one class against another, but to obliterate the idea of class, and to recognise the fact that all workers have equal interest in the general good, and that class demarcations and class feeling are entirely conventional and injurious to the general welfare of the community, and to the best mutual understanding and mutual help. Nor are the trade unions entirely justified in the very large claims they make to be heard on subjects involving the widest political and social interests. There are no doubt many secondary subjects more or less directly connected with their trades, which they may most profitably handle; nor is there any very obvious reason why the trade unions should not discuss political questions and make recommendations upon such questions with the degree of weight their numbers and influence can give them. But this, again, is no reason why they should claim to adopt the tone, as they certainly have done, of paramount arbiters and advisers on such questions. Education is needed for useful discussion of such subjects. To read the way in which some of the speakers expressed themselves,—the working

classes would not "tolerate" this, that, and the other,—it might be supposed that they were, or had a right to be, the governing body of the policy of the nation at large. What would they say if a congress of representatives of professions, or representatives of the landed interest, used the same tone? What an outcry the trade unions would then raise against class arrogance and class self-assertion. The trade unions are entitled to their share in influencing public opinion, and to no more than their share, and the sooner they recognise this the better. We willingly and cordially say that their tone on public questions is in the main a high one, and that much that is valuable and suggestive on important questions may be gathered from the debates of the congress which has just closed, from among a good deal which was one-sided and sometimes intemperate; but the didactic tone which pervades their expression of opinion, sometimes on topics which really have no connexion with the professed objects of a trade-unions congress, is to be deprecated as both unwise and out of place, and not calculated to increase their influence with the more thoughtful of the outstanding portion of the community.

Some of the special points touched upon in connexion with the working of the building trades we should have been glad to consider more in detail, but must defer doing so, at any rate, for the present.

THE COMMERCIAL VALUE OF ART.

WE hear a great deal in the present day about art, and in some quarters there has even been the expression, generally misunderstood, of positive nausea at the constant discussion of the question. But while there exists this feeling, prompted, doubtless, by the large quantity of "irresponsible chatter," the echoes of which reach us through the press from every quarter of the kingdom, the importance of art in all its bearings, social, moral, and commercial, is never lost sight of by the more thoughtful; they are, indeed, every day reminded of this fact, which, of course, to a great extent, is the suggestive cause of so much that we hear now said and written concerning art.

Theoretically, the subject of art and its influence has been for a century and more discussed, and ably, often exquisitely, discoursed upon by the favourite authors of Europe and America, and it is on the basis of these theories that so much has already been done to test their practical value; for it has at length come to be generally conceded that art has other bearings than its connexion with the painter. The sculptor or architect is still, however, in many sections of our strange society, scarcely recognised as an artist,—a word carrying with it to many only the idea of connexion with the palette. Happily, among the more influential members of the community such views are rare, though unfortunate stories are current in professional circles regarding the treatment of eminent artists even by members of our Legislature.

The importance of art as an essential commercial factor in our wealth as a nation, is daily becoming better understood in our practically-minded community, so much so, indeed, that it is gratifying to find that we are admitted by rival nations to be seriously menacing them on their own ground by our products,—countries whose commercial renown has long depended on their superior reputation for artistic skill.

In the present day the custom is much in vogue of reducing matters to plain figures. Now art, though essentially entering among the theoretical amenities of our existence, is capable of having its value reduced to the crude logic of statistics, and to those matter-of-fact seekers into the details of trade returns, as also to those who may be somewhat sceptical as to the commercial value of art, we beg to submit some facts, relating, it is true, to a foreign country, but that country one which has long justly held a world-wide reputation for the artistic superiority of its products,—France.

In a recent number of the *Révue des Arts Décoratifs*,—the joint publication of the Paris Museum of Decorative Art and the excellent institution of the Union Centrale, to which reference has more than once in these pages been made,—appeared an admirable article drawing the attention of the French manufacturing world to the ever-increasing tide of artistic products imported from abroad. France has long borne undisputed in the commercial world the palm in this respect, but within a few years foreign nations, aided by excellent systems of art-education, have succeeded in commencing a formidable rivalry to France and French products. France, satisfied with the reputation it has borne, has neglected to keep pace with the movement, and the more thoughtful members of the community foresee the possibility of a near future in which France may be beaten out of the markets of the world, and on the very point for which her products once held the foremost place. Such is the cry of alarm the writer of the article to which we refer has thrown out. His view he supports by figures.

In the first rank of art in the ordinary acceptation of the word, application is made to the statistics of the annual exhibitions. It would appear that of the exhibitors in this year's *Salon*, 1,439 were French, and no fewer than 416 were foreigners. On such facts, of course, no great stress can be laid. France in such a field can well afford, and in no way grudge, to spread abroad pupils who possess the mastery of their art which it would seem French institutions so successfully teach.

In a more practical direction the menace of foreign competition is evident. Comparing the statistics of 1880 with those of 1859, some definite results may be obtained. In 1859, France imported 61,650,000 francs worth (say two and a half millions sterling) of objects made abroad, a figure totally exclusive of all raw material or food-stuffs. In this total, half a million sterling was for objects acquiring value by their artistic worth. In 1880 the importations were 448,347,000 of francs (some eighteen millions sterling), a total in which enter some six millions of artistic products, the difference of four millions in the twenty years showing clearly the extent of foreign competition.*

Against the statistics of imports, let us now place those of the exports in the same year. Here, taking certain items (decorated cotton tissues, works in copper gilt, porcelain, playing cards, and cut coral) there will be found in the two columns ranged side by side a great diminution for the year 1880 as against 1859, but ample compensation is to be found in the characteristic items of millinery, books and engravings, bronzes, *objets de collection*, fashions, flowers, furniture, and jewelry,† almost each item of which, as reference to the details in the note will show, represents millions sterling. In all these instances it is to art and its application that is due the chief value of the products. It will be seen, we hope, that the commercial importance of a proper consideration of art and its practical application is worthy the attention of those unsympathetic with the more theoretical and æsthetic interests believed to be associated with art and artists. Such views are now, happily for the world at large, steadily gaining ground, with the direct result of causing France to look inquiringly into the boasted supremacy on which she has so far trusted and still continues too confidently to trust.

Statistics show that the exports of French products owing their commercial value to their artistic qualities amounted in 1859 to 665 millions of francs (some 26 millions sterling) and only 766 millions (30 millions sterling) in 1880, in twenty years an increase of only 15 per cent. In the former of these years one million sterling worth of artistic products was imported into France from abroad, and in 1880 no less than six millions, an increase of 488 per cent. We do not wonder that, in the face of such figures, there appears to the thoughtful Frenchman necessity for a cry of alarm at the danger signal ahead.

On our side a moral can also be drawn. England stands foremost among the rivals of France; within a generation England has made rapid strides in the direction of its art manufactures, as they are understood, and we owe this advance in great measure, not alone to our increased attention to art education, but to the wise foresight of many large employers of labour. Much, however, remains yet to be done: many efforts have to be made and results achieved in this direction. The commercial supremacy which France has so long owed to its artistic superiority,—a superiority it held almost undisputed as long as other nations remained in this respect behind-hand,—England may take, if not in totality, in great part at least. To the reputation we bear for the solidity and honesty of our products,—those chiefest elements of all truly artistic work,*—let us but add the grace, the elegance, and the due consideration to adaptability to use, qualities which are more generally understood to constitute art, and we may, as we already do in a great measure, hold a high position in the world for the artistic excellence of our products. It remains in the hands of our manufacturers, of our great employers of labour, of their numerous workmen and their directors, of the younger generation who are growing up under the teachings of daily-improving and increasingly-wealthy and endowed institutions. With the extension of the system of technical training, with the innumerable means now afforded of increasing, not alone our power, but our happiness, by the acquisition of knowledge, by the funds of originality suggested by a proper study of the contents of the storehouses of the art and industry of the past, our museums, we have it at our disposition to make an effort in a direction the attainment of success in which has at all periods of history formed the noblest aim of nations. To do this, and, in doing it, to raise our existence from the clinging horrors of sordid pursuits, to shed on the lives of those about us, in due proportion, the blessings of cultivation and refinement, would justify a large expenditure: it would be worth no small sacrifice to obtain in the commercial markets of the world as envied a place for the artistic value of our products as they long have held for their sterling worth and well-trusted honesty.

* Furniture in 1859, 1 million of francs; in 1880, 4½ millions; *objets de collection*, 2 millions against 10½ millions; arms 1 million against 2½ millions; cut coral, a quarter of a million against 2½ millions; wall-papers, 598 francs (!) against 1½ million; porcelain and faience a quarter of a million against 4½ millions; glass, enamel, &c., 1½ million against nearly 3 millions; books, 2½ millions against 4½ millions; jewelry, a quarter of a million against 5½ millions; engravings and lithographs, less than half a million against nearly 7 millions.

† Exports: jewelry, in 1859, 15 millions against, in 1880 52 millions of francs (a million of francs is 40,000*l.*); fine mercery, 58½ millions against 85 millions; fashions, flowers, &c., 10½ millions against 32½ millions; furniture, 7½ against 15 millions; *objets de collection*, 2 millions against 14 millions; books, engravings, 18 against 28 millions; wall-papers, 5 against 6½ millions; bronzes, 5½ against 9 millions; sculptured marble, half a million against 1½ million; sculptured stone, half a million against 730,000 francs; false stones, &c., 8 millions against 11 millions.

THE MEMORIAL WINDOW TO MARY TUDOR.

IT has been announced that the Queen has just presented to the Church of St. Mary at Bury St. Edmunds a stained-glass window, in memory of Mary Tudor, the daughter of Henry VII., known in English history as "Mary the French Queen," from her marriage with Louis XII., but to our neighbours more familiar as "La Reine Blanche," the incidents of whose life suggest the decorative motive of the window.

The story of Mary Tudor forms one of the many links that exist between the history of our own country and that of France. The young "Marie d'Angleterre," if scarcely as familiar to the French as is with us the French queen of Charles I., Henrietta Maria, has left in France a remembrance more than is attached to one merely of the many figures in the history of the country. Among the most widely spread of these associations is perhaps the connexion of Henry VII.'s daughter with the Mediæval building in Paris, now known to the public as the Musée de Cluny. Every visitor to Paris will remember the peculiar character of the Cluny Museum lodged in the quaint hôtel in which M. du Sommerard (the father of the present excellent director) had gathered the collection which was purchased from him by the French Government in 1843. The rooms of the former dwelling-house, now the museum, have to a great extent been left in their original condition, or, like the architecture of the rest of the building, have been restored. Of these rooms, that next the chapel,—the beauty of the architectural remains of which is familiar to every professional student,—bears the name of the Chambre de la Reine Blanche, a memory of the stay made at the Hôtel Cluny, in January, 1515, by the young widow of Louis XII., Mary Tudor, during the days of her mourning. An air of romance seems to linger round the room, which,

* When the Carlyles, as we see by the recently-published "Reminiscences of Carlyle," were about to leave Scotland for London, Mrs. Carlyle wisely determined to bring with her the family furniture, on the score of its solidity and honest workmanship. "Respect what is truly made to its purpose, detest what is fal-lal, and have no e-uvers with it." "My own heart," remarks Carlyle to bi-se f, "could not have been more emphatic on that subject . . . . My writing-table, solid mahogany, well-devised, always handy, yet steady as the rocks, is the best I ever saw. No book could be too good for being written here, it has often mutely told me."—See "Reminiscences of Carlyle," vol. ii., p. 189.

we cannot doubt, affects even many of the English and American visitors who pass through the museum without a thought of its historic memories, and still less its connexion with "home." The Chambre de la Reine Blanche is familiar to every artist who knows Paris, and often has served as a suggestive background for some *Salon* "hit," for the room retains much of its old decoration, which, when the hôtel was put in order, was discovered under the more modern paperhangings. The paintings, characteristic Renaissance works of the reign of Henri Deux, and representing groups of Italian ruins, with accompanying garlands and medallions, were in a sufficiently good condition to bear restoration, and they still exist to show to the present generation an excellent specimen of the domestic decorative art of a period which is now much in favour.

The residence of the young English queen at the Hôtel Cluny appears on historical evidence to have been at the invitation of Francis I., who had succeeded his father Louis XII. "The king gave order, we learn from the secretary of Cardinal Duprat, that the Queen Marie, widow of the late King Louis, should be honourably entertained, and the queen came to lodge at the Hostel de Cluny; the king coming often to visit her, and paying her every attention in his power." The chamber occupied by the princess has retained to this day, as we have already remarked, the name of the Reine Blanche, it having been the custom for the French queens to wear white during their days of mourning. Mary Tudor's mourning was not of long duration; she, indeed, regretted but little the royal husband who had been forced upon her, and who, on his sick bed, had, as he told her with much courtliness, given her as his New Year's gift her freedom by his death, and but a few weeks passed before the young widow, who had been warmly aided in the affair by Francis I., married an old flame, the handsome Charles Brandon, Duke of Suffolk, the original of one of the extraordinary series of portraits we owe to the patient exactitude of Holbein, and which was exhibited, it will be remembered, some years since at South Kensington. At the same exhibition there were two portraits of the duke and his wife, one by Holbein, the other by Mabuse, both bearing the famous and familiar lines:—

> "Cloath of Gold, doe not despise,
> Tho' thou art matcht to Cloath of Frize;
> Cloath of Frize, be not too bold,
> Tho' thou art matcht to Cloath of Gold."

As a fact which still further shows the many links existing between our own country and France, the daughter of Henry VII. had been married to the French king in the then royal palace of the Tournelles, the home since the Middle Ages of the French court, and occupied during the fifteen years' possession of Paris by our English troops at the commencement of the fifteenth century, by the Duke of Bedford, the regent in France of Henry V. of Agincourt fame, the father of the young Henry VI. who was so pomposly crowned King of France in the Cathedral of Notre Dame. The home of the Regent Bedford disappeared when the court moved to the Louvre, built by palace-loving Italian-bred Catherine de Medici, and on the site of the Mediœval palace of the Tournelles, with its pepper-castor shaped towers, now stands the seventeenth-century red brick Place Royale, better known to Republican France as the Place des Vosges.

A word more on an incident connecting additionally the past of the Cluny Museum with the history of England. Not many years after Mary Tudor had left behind her the tradition of her residence in the old hôtel, was celebrated within its walls the marriage of James V. of Scotland with Madeleine, the daughter of Francis I. It was from this union that was to spring the unfortunate queen, whose sad story is one of the most familiar of the romances of history,—Mary Queen of Scots.

Highbury Vale, London. — St. John's Church, which has been erected from the designs of Mr. Wm. Bassett-Smith, has been consecrated by the Bishop of London. It has a spacious and lofty nave, five bays in length, with north and south aisles; a chancel the same width as the nave, with a five-sided apse and aisles on each side. It provides accommodation for 820 adults, and the cost of the building has been about 7,000*l.* The works have been carried out by Mr. M. Manley, of St. George's-road, Regent's Park, under the direction of the architect.

THE DUST-HOLE.

NOTWITHSTANDING the modern love of luxury,—and especially the luxury that consists in a high degree of comfort and cleanliness,—we are not quite aware whether modern ingenuity has devised a perfect means of successfully housing, until its removal, the accumulation that we erroneously call "dust," but which actually consists mostly of decomposing and decomposed matter, with the peculiar nature of which most householders are familiar. The care, the labour, and sometimes, for their own sakes, the thrift of our domestics, contrive often to keep the offensive dust-hole at a sufficient distance from the eyes and nose of the owners of large houses to make a few of us, perhaps, unacquainted with the horror of this portion of the lower regions of our dwelling-places, but there are few of that numerous class in whose careers we are all so much interested,—the servant-class, as they are called,—who have not to endure every day of their lives the inconvenience and the actual danger arising from the dust-hole.

Here and there we find the situation of the dust-hole in the lower regions, ingeniously contrived so as not to be altogether unsightly, but it has an unfortunate way of asserting its presence; under any circumstances it occupies a space of ground, and pays ground-rent sufficiently important to call for some thought as to whether its room is not of more value than its company. But how, it will be asked, is the dust-hole in our houses to be got rid of? The contents of the dust-hole were once considered of value. Contractors were glad to take upon themselves the task of removing the dust from our houses; but things seem to have changed in this respect, and the business appears too large for the ordinary mind to grapple with, and complaints are now constantly made of the parish authorities whose duty it is to clear out the contents of our dust-holes whenever the accumulation requires. Some steps, it is evident, therefore must be taken in this direction.

Why should we not have recourse to the Parisian principle of doing away altogether with the dust-hole in our houses, and adopt the plan so successfully pursued by our neighbours of removing the accumulation of twenty-four hours, placing at the door of each house a movable receptacle containing the dust, and the contents of which are taken away before a certain hour in the morning by properly and strictly controlled contractors? In Paris the contractors are the municipal authorities, who, with the assistance of the police,—who have a certain control in the matter,—secure for the smallest apartment or the largest house a freedom from that horrible offensiveness that a dust-hole possesses after a few days' neglect, and from which, indeed, it is never entirely free from the imperfect manner in which, from its shape and the nature of its contents, it is emptied. The dustman and the *chiffonnier*, or rag and paper gatherer, in Paris, are the industrious removers and utilisers of the refuse of the town; they serve, indeed, as the human insects, the scavengers of nature whose use Sir John Lubbock could doubtless tell us so much about, and without whose action the world would be seriously inconvenienced.

The dust-question is one which would seem to puzzle not a few communities in the present day. Our practical cousins in New York have long allowed themselves to suffer serious inconvenience from the management of their dust-barrels which so unpicturesquely litter the "side-walk" of their streets, every puff of wind scattering in the air the varied contents of these neglected and unremoved dust-bins. But American ingenuity, although unable apparently to combat the glaring mismanagement (to say the least of it) of the municipal funds supposed to be devoted to the cleansing of the streets, has, we learn, devised a method which promises, to some extent, to reduce the evil of the storing of the decomposing matter,—which forms, in reality, the chief difficulty of the unemptied dust-hole.

A paragraph in the current issue of *Scribner's Monthly*,—a magazine whose practical treatment of social questions is by no means allowed to decline in favour of its exceptional artistic qualities,—describes a small and inexpensive crematory stove for the consumption of household rubbish. It has long been a custom, and a very objectionable custom, known to the cook and housewife, to throw on the fire much of the kitchen refuse, with the result, arising from the imperfect combustion of a mass of damp material, of producing an intolerable stench. The new American crematory stove is described as consisting of a zinc pail fitting on to the hole in the top of the ordinary kitchen stove or range, and by a simple system of double interior forming into a desiccating machine. The rubbish, when fully dried, passes into the fire from the pail by a false and movable bottom, and is, of course, rapidly consumed. As a means at the disposition of every householder of utilising his refuse, the new crematory stove promises something; it is, however, but a half remedy for the unsightly, unsanitary, and needless infliction of the regulation dust-hole, whose contents in a well-organised community should without fail be removed every day.

THE "LIVADIA" AT HER LAST MOORINGS.

WE confess that we entertain a horrible suspicion of a certain class of asserted scientific discoveries. We refer to such as drive, like a thunderstorm, in the teeth of the fair winds of either ancient learning or of modern progress. Not but that there are ebbs and flows in the great tide of science, or that that which was but yesterday thought to be a gain may by the experience of to-day be shown to be a loss. Of that we have abundant example. But we rather refer to what we take to be a special characteristic of the present day,—the discovery *ab ignorantiâ*. It consists in neglecting two or three of the essential elements of a compound question, and then finding it very easy of solution. It is as if, in an equation in which x and y are both unknown quantities, you assume that x *must* equal ten, and then proceed to solve the equation. It is like the reform in painting which consists in omitting aërial perspective, and paying scant heed to accuracy of drawing. It is like that pseudo-science which affects to predict the course of human affairs, leaving out of view the peculiarities of human nature. It is the improved version of "Hamlet," with the part of *Hamlet* omitted.

Such seemed to us to be the character of the blast of trumpets, penny and other, which welcomed the launch of the *Livadia*. Great names stood as godfathers to the vessel. An Imperial Admiral had adopted the ugly babe. Special correspondents baptised its first trip with champagne; and a gentleman considered to be a high authority on the construction of ships threw all the weight of that authority into the scale of praise.

We were members of but a small minority. We are not aware whether any other members of the Press ventured to hint a doubt, or hesitate dislike. From the first we were of opinion that to revert to the primitive form of the tub, even more ancient for flotation purposes than the square coracle of the ancient Britons, still to be seen on the Towy, and not unknown to boating men at Oxford, could be nothing but a blunder. We waited for details of the first voyage of the *Livadia*. It was not made at the speed promised, but such excellent reasons were given, as to prudence in steaming slow, for fear of meeting a fog, or something to that effect, that we thought the apologies more suspicious than the delay. Then some floating wreck knocked a hole in her bottom. One or two trifling accidents kept the vessel from proceeding on her cruise. She was a great success,—every one knew that. Great authorities proved that; and the present of 40,000*l.* to the builders completed the overwhelming proofs. Still, in spite of all, the *Livadia* lingered at Ferrol, and the demonstration of the great success was postponed to a more convenient season.

A more convenient season, at least for the opponents of the *Livadia*, has now arrived. A commission has sat in judgment on the famous yacht, has tried the *Livadia*, and found her wanting. "She is slow, she rolls heavily, she is too weak, and she is made of bad materials!" We cannot but suspect that here the pendulum has swung too far in the opposite direction. That such a cross section was utterly inconsistent with speed or with economy of steam power, we stated in the first instance. No one familiar with the result of Mr. Froude's beautiful experiments on the forms proper for ships can doubt that. Whether she rolls heavily we cannot say. The very aim and object of her being was,—not to roll; the fair-weather description of her one voyage dilated on her steadiness. Here, then, we should like some more reliable evidence than that of the Imperial Commission, which has

discovered that the unfortunate ship is built of bad materials. As to that, we shall probably have a word or two from the builders, who received so substantial an acknowledgment of the excellence of their work. That the vessel was not strong enough is a natural vice of her design; and we are inclined to suspect that the three distinct propellers may have so acted as actually to tend to tear the vessel asunder. We think that the report of the Commission bears more sign of political bias than of engineering investigation. But as to the condemnation, and the necessary condemnation, of the *Livadia*, there is no doubt, although the Commission have done their best to render ridiculous their own report by recommending that a smaller *Livadia*, on the lines of the turtle ship, should be constructed out of the materials of the demolished monster, not of the deep, but of the shores.

BUILDING AND ENGINEERING CONGRESS IN DANTZIC.

The tenth assembly of delegates from the associations of architects and engineers in different parts of the German Empire, has recently been held at Dantzic under the direction of the Central Union of these societies. The proceedings are interesting to English members of the two professions represented, as in addition to dealing with the official and technical subjects which naturally were discussed, the delegates gave much attention to matters affecting the relations between their societies and the respective Governments to which they are subject, as well as to economical and other topics which refer to the connexions of professional men with the community at large.

The total number of societies represented at the Congress was seventeen, and the number of delegates thirty-two; the total votes were fifty-six. Of the twenty-six societies which compose the Union, nine were absent, but the composition of the assembly was such as to make it represent with fitness the two professions as they now stand. The societies belonging to certain provinces or districts were those of Bavaria, Saxony, Middle Rhine, Lower Rhine and Westphalia, Schleswig-Holstein, West Prussia, East Prussia, Brunswick, and Thuringia; while the societies attached to particular cities were those of Berlin, Hanover, Hamburg, Breslau, Dresden, Lübeck, Bremen, and Aix-la-Chapelle. The central authority was represented by Herr Professor Köhler and Herr Schwering, the former being president of the assembly; the vice-president and secretaries being selected from amongst the delegates.

The proceedings commenced on Monday, the 29th ult., but the bulk of the delegates and visitors had arrived by the preceding day, and had had an opportunity of meeting in a social manner, so that old friendships could be renewed and new acquaintances formed before the official inauguration of the Congress, which took place with due formality on the morning of the 29th, in the Council Building of the Municipality. The financial statement showed an expenditure of about 100*l.* by the Union during 1880, leaving a balance of about 70*l.* in hand. During the Congress resolutions expressing the thanks of the delegates for the reception accorded them by the civic authorities were cordially approved, and its duration was marked by several gatherings of a social character, which were fully appreciated as agreeable variations from the technical and economical discussions of which the proceedings of the Congress in a great measure consisted.

Proceeding now to record a few of the leading subjects of discussion, we note that the important subject of uniformity in technical nomenclature has met with a full share of attention. It is proposed to continue the special committee charged with the question of the uniform designation of mathematical and technical dimensions, the labours of which are progressing satisfactorily. The suggestion made at last year's meeting by the Leipsic society as to the nomenclature of the different floors of buildings, has been since then approved by many of the other societies. In this system, the floor wholly or partly underground, is called the cellar-story, the next the ground-floor, and the higher ones, first, second, and third stories. Intermediate stories of a subordinate character are called half-stories or mezzanine floors. It is stated that in Prussia certain official regulations stand in the way of the general introduction of this system.

The results of experiments as to concrete building, it was stated, will be published very shortly in one of the German technical papers, and therefore the question was not discussed.

The value of accurate details of a technical nature as to buildings and engineering works has long been recognised by the Central Union, and eight societies have collected in tabular form a variety of information as to 736 architectural and other works. An obstacle has been placed to the completion of this valuable work in its original extensive form, by the refusal of the Prussian authorities to furnish details of the State buildings under their charge. The Government has been for some time preparing for publication details of the same character as to all Government works executed since 1870, and therefore the authorities decline to help the Union in the matter. The information collected is, however, of such a valuable character that the Congress resolved to entrust the executive committee with the task of utilising the materials in their hands in the most suitable manner, either by publishing them separately, or by joining with the Government, in order that the work on which the State is engaged should be as complete as possible, and should serve as a standard book of reference for the building and engineering professions.

At last year's Wiesbaden meeting the invitation of the central body for members of the profession to exhibit plans of dwelling-houses had been amply responded to, but the collection was not typical of the domestic architecture of all parts of Germany. The assembly then approved a proposal made to publish the plans sent in, and to obtain such additional elements as would give the work a thoroughly representative character. The labours of the Mid-Rhenish Society in this direction have been successful, and the publication of this work seems assured, although more exact details cannot at present be announced.

Another work, prepared under the auspices of the Union, and which is nearer publication than those to which we have alluded, is the illustrated volume on wood-architecture now being brought out by the publishing firm of Ernst Wasmuth, of Berlin. Some proofs of the earlier parts of the volume were submitted to the meeting, and after a discussion of some length as to whether the illustrations should be photographic delineations or merely ground-plans and elevations, the meeting resolved to forward in every possible way the production of this useful work, and contributions were invited from those societies whose districts were not represented in the information now before the compilers of the book. It is expected that the volume will appear at latest within a year, and the fact that the publishers are undertaking all risks in connexion with it would seem to indicate their high appreciation of its technical merits.

Other matters of a professional nature were discussed which had been the subject of debate at previous meetings. In addition to these many new topics were introduced on which further information is looked for by the time of the next assembly. Amongst these we may notice the subject of the situation of young architects, and the question whether there is any means of improving the general position of the junior members of the profession in Germany. The improvement of the instruction at the practical schools was also touched upon, with a view to more complete discussion on a future occasion. Amongst the strictly technical points which were dealt with in a similar way, we notice questions as to the preparation of stones for building, and the use of glazed tiles for roofing purposes. These matters will be again treated at next year's meeting, when the experience of the various societies will be brought to bear on their discussion and ultimate elucidation, for the benefit of the building interest in general.

The questions of a more public character which occupied the attention of the Congress are such as to claim particular notice, as they deal with points affecting the relations of the professions with the different Governments and with private individuals.

The codification of the German civil law has been kept in view by the Union, and will still remain before it, although there is no immediate occasion for action. The publication of the work dealing with legal precedents affecting the responsibilities of architects and engineers towards the persons employing their services, is to be proceeded with on the basis of the materials which are collected by the end of this year, and the work is expected to appear in April, 1882. It has for some time engaged the attention of the Hamburg Society, and will include models of contracts and other information of value as to legal matters.

A most important subject of discussion, affecting the external relations of the Union, was the question of statistics as to building matters, which has for ten years been receiving the attention of the central body. The Bavarian society first suggested the collection of statistical information in such tabular form as would be valuable for purposes of reference to those interested in national economy, hygiene, and other sciences of a practical nature, while serving as a text-book for architectural students. The result of its experience has, however, led the Union to the conclusion that, as a central body, it is not in a position to bring the work to a successful termination, and that the intervention of the State can alone accomplish that end. It was, therefore, resolved that the Berlin Society (in conjunction with those of Bavaria and Hamburg) should prepare a memorial setting forth, with all possible lucidity and conciseness, the different points which require the attention of any public body undertaking the work. This memorial will be presented to the respective Governments interested, and, as it will summarise the work already done, it will, no doubt, facilitate the acceptance by the different authorities of the responsibilities which the Union invites them to undertake; in the carrying out of which, however, it promises to assist in every possible way.

An equally important subject of discussion was the altered position of the Union towards the International Patent Congress, in consequence of the absence of Germany from active participation in that assembly, and by the adoption of certain projects opposed to the wishes and interests of the German nation. The committee which had been engaged in watching the interests of Germany, being thus deprived of the means of action, did not, however, consider its mission ended, but set about the formation of a new organisation for the protection of German patent interests. The question before the Congress was whether the Union should as a body support this proposal, and although the presiding committee was in favour of the continued participation of Germany in this international question (with a view of preventing the country occupying possibly an isolated position), the decision of the assembly was for an opposite course, and such will therefore be adopted by the Union.

Amongst the subjects on which discussions were commenced (with a view to their more thorough ventilation next year) was the important question of the diffusion through the press of information as to building and engineering matters. One speaker attributed the general absence of such topics from the newspapers of the day to the apathy shown in many technical circles as to this subject. A resolution was adopted inviting the co-operation of the different societies forming the Union, in the work of diffusing through the daily press accurate information as to the transactions of the Congress, and thus enabling the general public to follow the development of building and engineering science. The technical press also received its share of attention during the Congress. The details published during the year as to technical societies in other countries by the Union were briefly considered.

The programme of the Congress included visits to some of the most interesting architectural and engineering works in the neighbourhood. Under the former head may be classed the Rathhaus (built in 1350), the Marienkirche (built in the fifteenth century), and the Franciscan cloister, which dates from the same period.

The water supply and drainage systems of Dantzic attracted the special attention of many professional visitors. Within the last twelve years these have witnessed the execution of improvements which tend to place Dantzic in a favourable sanitary position.

The harbour was also an object of interest, and an agreeable diversion from the fatigues of theoretical discussions was afforded by a trip in a steamer to the neighbouring harbour of Zoppot.

While thus giving a general idea of the scope of the Congress, we have had to pass over in silence many matters which might have proved interesting. Those mentioned by us will, however,

give some idea of the present position of technical matters in Germany, and if we take into account the attention which has been called to the practical parts of the sciences of building and engineering by this year's exhibitions at Brunswick, Frankfürt, and other places, it cannot be considered that a more fitting climax could be arrived at than that afforded by the theoretical congress at Dantzic, a report of whose deliberations we have endeavoured to present (though necessarily in an imperfect shape) to our readers.

KEIGHLEY AND ITS TRADE.

THE towns in the West Riding of Yorkshire are usually more distinguished for industry than for architectural beauty or for their historical associations; but one of the most notable,—Keighley,—is of great interest from its antiquarian associations, has had of recent years a marked and rapid growth, and has become a centre of one of our great trades. In the deep valley, at the junction of the little rivers Worth and Laycock,—if they may be called more than rivulets,—is the town which gave name to, and long sheltered, a knightly family, from which the dukes of Devonshire trace their descent. In the stormy days of civil war, Keighley was occupied by the Parliamentarians, and in 1645 there was a sharp attack and recovery. If, however, we leave the era of battles and bloodshed, and come down to the present century, we may find, in the comparison of the town as it is and as it was, one of the indications of growth of industries and of towns, of which Yorkshire affords many examples.

The irregularly-built little town had about half a century ago its full supply of water, and its gas supply; it had a neat court-house; the Leeds and Lancaster Canal gave it ample facilities for water conveyance; but the era of the railway was not. Its ancient church had been rebuilt at the beginning of the century; and that handsome structure, with its fine steeple and its "exquisite" clock, was one of the few ornaments of the town. There were seven or eight Dissenting chapels, and a free grammar school; and a mechanics' institute was in course of formation. About the town was an oasis of beauty,—blue heath on rugged hills contrasting with the fertile valleys, whilst the Aire was not then so much the reservoir of mills as it now is. The trade of the town in those days was largely in stuffs, worsted yarns, and cotton; the population, which had been 5,745 for the parish in 1801, had risen by 1831 to 11,176; and there were all the indications of further growth. There were in the town three cotton-spinning firms; there were curriers and leather-dressers; one or two hat manufacturers; three reed and heald-makers; and the like number of spindle, roller, and flyer-makers; whilst of worsted spinners and stuff manufacturers there were some thirty or so, but many of them were on a small scale. To Bradford, Leeds, Preston, Skipton, and Halifax, coaches went daily; there was the conveyance by water that has been hinted at; and there were half a dozen carriers. Finally, the state of the trade of the town is indicated by the fact that there was one postal arrival and despatch daily.

"Railways," said Carlyle, "have set all the towns of Britain a-dancing," and they have had their effect on Keighley since the opening of the Worth Valley Railway. The two great cotton-mills of Sir Richard Arkwright still lift up their tall heads; and worsted and cotton spinning, but in its wider form, constitute the chief trade of the town still, though there has of late been the introduction of the machine trade in one of its branches on a scale of some magnitude. Not so much a rapid as a steady growth has been known by the trade of the town, because the tendency has been in the textile trades generally to keep in the villages and to increase them as a whole, and hence it is that the growth of the West Riding, apart from the very hilly part, has been so general. But at the present time the tendency is becoming a little more marked to concentration in different localities, and it is to this that we have to trace the growth of the population of Keighley from 11,000 half a century ago to over 24,000 in 1871, with that growth since which the recent census has just shown. Except in the way of addition or extension, and in the smoothing down of some of the parts that showed its irregular character, the chief feature of Keighley has been its filling up and its attainment of some of the characteristics of towns. Its church and chapel accommodation has been increased, and it is possible that, though it cannot compete with its great neighbours yet, Keighley may show in time an order and an arrangement that will be creditable to it in its once-straggling buildings. It has for over fifty years been one of the centres of mechanics' union effort, and the work done by its institute is far above that accomplished in some towns of greater pretensions. In a recent year, that institute reported that the total number taught by its classes exceeded 900; that in that year, as the result of steady honest hard work in competition with other youth, a Keighley lad, taught at the trade-school, had gained scholarships of 210*l*. That trade-school is one of the features of Keighley, and this is due, in a very large degree, to the patronage that the Duke of Devonshire has accorded it; whilst various scholarships, maintenance grants, &c., sustain the connexion between it and the elementary schools of the town. About 140 usually attend the trade-school, and the work done, especially in the machine construction and practical chemistry classes, has long been noted as excellent. In the schools of art attached to the institute some scores of students yearly derive benefit; whilst in other branches of study the institute of Keighley is in a very considerable degree performing the work that its early promoters had in view. Its membership is usually from 2,100 to 2,400, or more than a twelfth part of the population; its annual income is from 1,500*l*. to 1,700*l*.; its library is of 6,000 volumes; in the penny bank there is yearly deposited about 1,300*l*.; and there are other indications of its value to the town, and of the after-results that must be expected to flow from the inculcation of the principles it teaches.

In this district there is that sturdy dogged type of character that Miss Brontë loved to picture in her little home three miles away. From the busy streets of the noisy town of Keighley, brawling ever and anon at its guardians' meetings, the mind turns to that pretty walk up the Worth valley to Haworth, where "Jane Eyre's" writer lived and loved her stern but beautiful moorland, and the people who dwelt there who merited the description "frosty but kindly." This is the phrase that may be said best to depict the town of Keighley, for a hard, shrewd, money-making race dwell therein, and the trade of the town is safe in their keeping. The want of minerals gives not that promise of rapid growth that the north-east of Durham and Yorkshire shows, but there is a steadiness in the trade, and a solidity in its growth, from decade to decade, that is not always associated with rapidity. And with a continued increase of that town feeling which produces public-spirited citizens, and provides for the people all the essentials of town life, there should be a still greater and higher future for the town, and a still more rapid increase of its trade. It has capital, enterprise, and technical skill; it is likely to enlarge its trade facilities; and it is giving to the growing generation that practical knowledge which will lead to the better use of the former advantages, so that the future success of the town and trade of Keighley should be assured.

ENGLISH AND ITALIAN ART WORKMEN.

It is interesting to contemplate the difference between the art of the past and that of the present, and the difference between the modes of art production in past days and the art action of those who brought it into being, and of those who now bring art into existence. We know well enough, for it is sufficiently familiar, how a work of art, speaking generally, of to-day, is more or less rapidly, though by degrees, brought into being, and how many there are at times engaged in its production, *e.g.*, a painted glass window, or a group of statuary, not to speak of the decoration of a building. But there is a question of modern art action which, at the present moment, would seem to be of more than usual and passing interest, and it is that of the desirability of employing foreign art help; in other words, Is it possible, and if possible, desirable, to employ foreign workmen, with a distinct and individualised art and fine art of their own, to assist and even to lead in the production of an art, or architecture, with its ever-present sculpture and other decoration, foreign as art to such workmen, be the status of such workmen what it may? A recent letter bearing on this subject, by a student and workman who has sought out work in classic Italy and failed to obtain it, is suggestive, and points to matters artistic not a little curious.

In the first place, there is not, and can hardly be, an art-subject more curious and suggestive than that of the entire isolation of the nationalities and the fine arts of them of the distant past. If we go to antique Athens and try, as best we may, to realise the aspect of that famous city, so full of art, every street of it a museum, nothing probably would be found to be more striking than the isolation, and the sameness, so to put it, of its art, all about, and everywhere, and in all objects,—from its public buildings, its temples, and its monuments, down to the very commonest and most familiar articles of domestic use, its houses, and the furniture in them. All is Greek, and Greek only, and all is done by Greek hands, and the "handwriting" of such workmen is Greek, and Greek is as visibly written on it, and is as evident to the eye and mind, as is the nature of the material out of which it is wrought. There is no sign of foreign workmanship anywhere, or evidence of the existence of bodies of workers drawn from a distant and strange nationality. All and everything is Greek, and Greek alone. Free trade in art certainly did not exist in antique Athens, and the very isolation of the place, and its working for and exclusively by itself, whatever the disadvantages of such a course of action otherwise might be, had, there can be no doubt, this one advantage,—that it fostered a distinct and isolated nationality and language, and with them, a distinct and isolated art character of architecture and sculpture.

It was the same with Egypt and Assyria, for what can there be more isolated and fuller of individuality than the art and the architecture of old Egypt? To have borrowed anything, no matter where from, would have been to the Egyptian an all but impossible act,—he could not have done it. To have added anything foreign, any strange form or element, to his own special work, would have destroyed his art-faculty and instinct, and would have extinguished his very nationality. Indeed, may we not go yet further, and affirm that his architecture, great as it was, and as it yet is in its ruins, growing up, as it seems to have done, out of the necessary plans of his huge temples and temple arrangements and ritual requirements, could not have been at all, had he borrowed anything, or had he left his Nile river-banks for a foreign idea or for a foreign workman? And may not the same be said of the Assyrian, on another continent, for he was alike isolated, and with an art instinct and idea of his own, and certainly with an *architecture* peculiar to himself, so well fitted for the purposes and special uses to which he put it? The Assyrian, be it borne in mind, was on a level, as near as might be, with the Egyptian, and in the same stage of "civilisation," to use that somewhat ambiguous phrase, and, with the Egyptian, made up no small part of the world of that now so-far-off day.

We have thus but just glanced at the past of art, and at its mode of production, for the purpose of calling a moment's attention to the difference between it, and our modern and of to-day modes of doing the same work, and in the main, and speaking generally, for the like purposes; for, after all, human nature is the same all the world over, and through all recorded time. In the past, then, we see a number of distinct and isolated centres of art action and power; but in the present how different is everything! All is simply reversed. Art isolation, in the antique sense, has all but vanished, and art is day by day growing less and less distinctive, and more and more general, and art objects everywhere, in Europe at least, are all but alike. Nay, is it not a fact, and a right notable one, that there are what may be well termed "art centres,"—centres of art manufacture, which have been established for the express purpose of supplying generally the whole of Europe,—the world, indeed,—and its individual and separate nationalities, with art objects, and with things of every-day requirement, so decorated and ornamented as to suit, as it is thought, the special requirements, and art taste, and aspirations of those for whom the objects are manufactured? And, together with this, there is what may well be termed an all but universal idea and system of art teaching, thus compelling those who learn to imbibe like art-ideas and methods of work, all tending to the production of like "results."

And not only are the art-productions of each European centre, with each its separate nationality and language, getting to be more and more alike, and not at times to be distinguished the one from the other, but, what is more startling, there is the fact of the employment, by each nationality, more or less, of workmen foreign to it, from other and diverse nationalities, and it is beginning to be thought, by not a few, that this is a positive gain, and that the art-power of the time is increased by such method of work, and that, through it, a sort of general, and, so to phrase it, universal art-power, applicable generally and everywhere, must eventually and in time be created and become available. And no doubt this is so, as our schools of art prove, and as our periodical exhibitions of art products show. But whatever the advantage and the gain by such universal methods may be, and however systematised, and however perfect the results, of one thing we may be sure, that these results must needs be more or less alike and similar, and all but duplicates of each other, and that before such powerful and effective teaching, and uniformity of teaching, all "nationality" and almost individuality, must needs in time disappear. There may, as we say, be gain in all this, but there must be loss too, and a very great loss.

In the note to which we have referred, it is stated that a most determined resistance on the part of the Italian workmen was made to any interference with them, or to any attempt to add even but one more to their numbers. It would be not a little interesting to know whether this resistance to any addition being made to their numbers arose solely from this simple cause, or whether, in addition to this cause of alarm, there was not that of a desire to keep their nationality intact, and a determination not to admit a foreign art element or influence. The art they produced was Italian wholly, and must needs, as we may suppose, interest them as such, and the introduction of another style of art-handwriting may have been resented. Was this so? The English workman and artist may be, as he says, as good to the full as an artist-workman as those with whom he sought to ally himself, and this they may have been conscious of but it might have been curious to learn as to how far, if at all, they resented this intrusion of a foreign art element into their purely Italian art, and amidst their national way and method of producing it. That this would and must have been felt at divers periods of art history, there can be no doubt; and the interesting question hence here arises, does the Italian art workman of this present day feel this?

CASTLES OF THE EARLY ENGLISH PERIOD.

THE transition from the Norman to the Early English style, which in ecclesiastical architecture constitutes a period of great interest, is by no means, at least in England, so strongly marked in buildings of the military type. The rectangular and circular or polygonal keeps, with their Norman features, retained their hold upon English castle-builders through the reigns of Stephen and that of Henry II., 1135-1189, or for a century and a quarter from the Conquest, or even later. At Dover, the dog-tooth ornament and a bead moulding, combined with very decidedly Norman features, mark the transition period, as do the ornamental details of the rectangular keep of Helmsley, and the particulars of the shell-keeps of Tamworth and York. The later keeps are known by the increased depth of the pilasters, which become buttresses, as at Dover and Clun, and in the twelfth-century keep of Chambois (Orne); sometimes by their improved and fine-jointed ashlar, as at Hedingham; by a more frequent use of the stone of the district instead of that brought from Caen; by the presence of ribs upon the groins of the hip-vaulting of the galleries and mural chambers; by the use of nook-shafts at the exterior angles, as at Scarborough and Castle-Rising; and by the greater tendency to ornament about the rib bosses, door-cases, window recesses, and fire-places, and by the more or less Early English character of such ornamentation. The portcullis is perhaps less rare in the later keeps. There was, however, little change in the internal arrangement so long as the Norman outline was retained, and but little tendency, so far as the keep was concerned, towards flanking defences. Passive strength is still relied upon.

Little is known of the *castra adulterina*, of which so many score were constructed during the reign of Stephen, and destroyed by his successor. They could scarcely have been of the solidity of the Norman keeps, else their demolition would have been a more difficult task. They were probably either of timber, or mere walled inclosures of no great strength. Few, if any of them, represented the chief seats of large estates, and being built for the most part on new sites, the earthworks were inconsiderable, and where the works above ground were destroyed there was little left to show where was their site. Among the latest rectangular keeps should be mentioned the tower at Penhow, Monmouthshire, the cradle of the house of Seymour; and that of Fonmon, in Glamorgan, still inhabited. They are small, without pilasters, and with scarcely any Norman features, and belong to the Early English period, as, judging from its foundations laid open, and from some fragments dug up, several years ago, did the castle of Sully, near Cardiff, and probably that of Dunraven, in the same county, the remains of which are built into a later house.

By degrees, as the Norman towers and shell-keeps fell out of fashion, they were succeeded by towers of a cylindrical form, known as Donjons, and this change corresponds to the middle period of the Early English style in ecclesiastical architecture. Scientifically, in a military point of view, this was scarcely an advance, for the defenders of an isolated round tower could not concentrate their fire, and could only protect the foot of the wall by exposing themselves at its summit. On the other hand, with equal material, the round-tower was stronger, and more difficult to breach or to bring down by a mine. Also, it admitted of being vaulted in every story, and was thus more compact and less exposed than the rectangular keep to being set on fire, either from within or by balls projected upon its conical roof. Usually, however, in England, only the basement was vaulted, as at Bruuless. At Pembroke the great round tower is vaulted at its summit, as are some of the cylindrical towers in the *enceinte*; but it is possible that these elevated vaults may be additions. At Coningsborough the basement alone is vaulted, and the vault is entered by a ladder from an aperture in the centre of the dome, under which is the well; the basement, as in Norman and Early English towers generally, being used as a store-chamber, and seldom, if ever, as a prison. In fact, in a single tower, whether rectangular or cylindrical, intended by its passive strength to defy attacks and to wear out the patience of a blockading force, an ample store of provisions was of the first consequence, and to their storage all the spare space was necessarily devoted. In those days, when the keep was the citadel, and not unfrequently used as such, prisoners were not kept within its walls. Dungeons there were none, save in a very few exceptional cases, and the basement or ground-floor was invariably occupied as a magazine.

These donjons were usually entered at the first-floor level, either by an exterior stone stair, or by one of timber; or sometimes, as at Pembroke, by a drawbridge, which dropped upon a detached pier, whence an inclined plane or a flight of steps descended to the ground level. In their elevated entrance, and in some other respects, these donjons recall the isolated towers erected during the decline of the Roman Empire, of which a good example, but square, remains at Autun. There are only two instances in England of the application of a forebuilding to cover the entrance of these towers, but these, Chilham near Canterbury, and Orford in Norfolk, are late Norman, not Early English. Dolbadarn in North Wales, a rather later tower, but cylindrical, has an exterior stair of stone, which, however, may be an addition.

There were commonly three floors. The basement was for stores. The central floor contained the principal apartment, usually with a fire-place, and sometimes with mural chambers, one of which is almost always a garderobe. The flues of the fire-places and the shafts of the garderobes are often vertical, and contained within the wall. The upper floor, was either for the soldiery or for a bedroom for the lord. The walls are ordinarily 10 ft. to 12 ft. thick, and there is often a well stair, as at Skenfrith in Monmouthshire, from the first floor, leading to the upper chamber and the battlements. In some of the ruder towers, as in that near the church of Aghadoe, near Killarney, the ascent from the first floor is by narrow steps projecting from the interior face of the wall into the chamber. In the larger towers, as at Coucy, there is often a small chamber in the wall, over the main entrance, for the working of a portcullis. Now and then the staircase begins at the ground-level, ends at the first floor, and begins again at the opposite side, as in the rectangular keeps. Thus no one could leave his post on the battlements without the knowledge of the captain, who lived in the main chamber.

Where the cylindrical tower formed the donjon or keep, it was commonly placed within the area, as at Bruuless and Skenfrith. At Coningsborough it stands upon the outer wall, at Pembroke on the wall of the inner ward; but in neither case is there any communication between the tower and the rampart of the wall. At Coucy the tower stands on an inner wall, but is girt about with a low concentric wall covering the foundations. At Launceston the annular space thus created between the tower and the girdling wall was roofed over, and there is something similar round the tower of Penrice in Gower. At Tretower a round tower has been built within an older rectangular keep, and the space between roofed over. In these cases the outer wall was about half the height of the tower. At Lillebonne and Coucy the tower has its proper ditch, as at Caldecot in Monmouthshire.

Coningsborough on the Don is the most complete English example of the Early English or Transition Norman cylindrical keep. Pembroke, though rather later, and of far inferior workmanship, is also, in its proportions and dimensions, a very fine building. Launceston, Tretower, Penrice, Skenfrith, Bruuless, and Dolbadarn, are good examples, as are the Danes' tower at Waterford, and the small and rude, but very curious, tower at Aghadoe. At Nenagh also is a very fine tower, apparently of the Early English type. The round keep of Barnard Castle, though of nearly similar pattern, is of later date. At Whitchurch, near Cardiff, are, or recently were, the foundations of a detached round tower of considerable diameter, the base mouldings of which showed it to be of Early English date. At Caldecot, a fine old Bohun Castle, admirably described by Mr. Octavius Morgan, is a round tower, probably Early English, having a ditch of its own. This tower crowns a small and evidently artificial mound. It is now a mural tower upon the line of the outer wall, but it seems to have been cased, and the core is probably, or possibly, the keep of an earlier castle.

These English towers, though curious, are far inferior to those of the same period remaining in France, whether keeps such as Étampes, 1160, the plan of which is a quatrefoil; or Roche-Guyon, where one-half of the cylinder is absorbed in a triangular spur; or mural towers, as the King's Tower at Rouen, that at Carcassonne, and a specially fine one, lately restored, at Pierrefonds. The keep at Nuremberg is also a good example. The tower of the Louvre has long been destroyed, but its base was recently laid open, and found to contain two shafts, a well and a sewer.

Probably the round towers, or keeps, are the oldest examples of the form, but very soon afterwards they came into use in England and France as mural towers, flanking and strengthening the *enceinte* wall. They were especially used to cap an angle or to flank a gateway. There is an example of a round tower capping an angle, of this date, in the Tower of London, known as Bell Tower. Marten's Tower at Chepstow is a good example of a mural tower of the Early English period, having a fine oratory attached. Its interior is a complete cylinder, but the exterior, or gorge wall, seen within the court, is flat. At Rochester, the angle of the ward next the keep has a circular tower, or rather a buttress tower, as it is not higher than the curtain. In such positions their passive strength was a great advantage.

In the latter part of the twelfth and the beginning of the thirteenth centuries much was done to introduce domestic comfort into castles. Fireplaces, which in the Norman keeps are but recesses in the wall, often with a mere lateral orifice for a smoke-vent, as at Colchester and Rochester, are now adorned with hoods, often of stone, sometimes of wood and plaster, and the flues are capacious and calculated to carry off the smoke. The stone hoods are usually of excellent masonry, and, even when plain, of much elegance of design, resting upon

brackets, and these on clustered columns flanking the hearth. The vent or flue is often capped by a chimney-shaft and smoke lanthorn, such as may be seen at Grosmont and St. Briavels castles, or in the remains of the Priory at Abingdon. Where the hood was of wood or plaster, with a shaft of the same, or where there was an opening or louvre in the roof, all traces are, of course, gone, and thus is explained the absence of fireplaces in rooms evidently intended for ladies and persons of rank.

In the Norman keeps boarded floors were a necessity, and very ill-jointed and cold they no doubt were, but with the vault the floors were composed of beaten lime and sand. Garderobes continued to be frequent, both in mural chambers and on the battlements, and the shafts were usually vertical, and descended within the wall, having an outlet at the foot of it. The hall, chapel, and other buildings, placed usually in the inner ward, were more ornate than in the Norman period.

In addition to the flanking defence afforded by towers upon the line of the *enceinte* wall, there was in general use a contrivance called a "Brétasche." This was a gallery of timber running round the walls outside the battlements, and at their level, supported by struts resting upon corbels, and covered in with a sloping roof. Sometimes, in large towers, there were two tiers of these galleries, the upper projecting beyond the lower, and thus affording a very formidable defence. As these galleries concealed the top of the wall, this part was often left in a rude state, and now that the *brétasche* is gone, such towers, as at Caerphilly, have a very unfinished appearance. The *brétasche* was only put up when a siege was expected, and examples of it are very rare indeed, although it is evident in numerous instances that it was formerly in use. There remains a fragment of the actual *brétasche* over the Soissons gate of Coucy; and at Ledes, over the outer gate, is the place of its main beam. The tower of the Palazzo Vecchio at Florence shows by its lines of corbels that it was intended to carry a *brétasche*, and a door is seen, as at Norham, in the wall, which could only have opened upon a timber gallery. Château Gaillard, the work of Richard I., has what is not unlike a *brétasche*, executed in stone.

The best example in England of the kind of tower which succeeded to the rectangular and shell-keep of the Norman period is the keep of Coningsborough, which, though containing certain Norman ornaments and details, belongs to the Transition period. It stands on the summit of a natural hill, and forms a part of an earlier *enceinte* wall, which has been clumsily broken to admit it. The tower, about 70 ft. high, is cylindrical, about 50 ft. diameter at the base, and 40 ft. at the summit, but the cylinder is supported exteriorly by six buttresses of great breadth and bold projection. There is a basement domed over with a central hole above the well. The only entrance is in the first floor, about 12 ft. from the ground. The upper floors and the roof were of timber. The staircases are in the wall, winding with it. There are two garderobes, two fireplaces, no portcullis, and in the upper part of one of the buttresses is an oratory. The roof was a cone, but sprang from a ring wall, about 3 ft. within the battlement wall and the rampart walk. By this means the tower could be defended without a *brétasche*, which would not have been the case had the roof rested on the outer wall. A similar arrangement may be seen at Marten's Tower at Chepstow, and at Pembroke.

It is not, however, in England that the best examples of these Early English or Transition keeps are to be found. In rectangular and shell keeps England has some fine remains, but in France Philip Augustus carried the new style of building much further, and even now there remain keep towers of that time which have defied time and the madness of the Revolution, and still remain tolerably perfect. The greatest triumph of the period, in this case early in the thirteenth century, is the tower of Coucy, probably the finest military tower in Europe. It is the keep of a castle which is itself the citadel of a town, also strongly fortified. This wonderful work, a cylinder of fine masonry about 98 ft. in diameter, and rising clear and unbroken to 180 ft., was the work of Engerrand III., Sieur de Coucy, and the most powerful Baron of his age. The walls are of great thickness, and the basement and upper floors, three in number, were vaulted, each in twelve deep and pointed cells. A fosse, paved and walled, 20 ft. broad and 12 ft. deep, the counterscarp of which is raised as the wall of a *chemise*, surrounds the base, and protects it from the operations of the miner. A drawbridge, crossing this fosse, leads to the first floor of the tower by its only entrance, which is protected by a portcullis, an interior *meurtrière*, and a stout door. From the entrance passage a staircase ascends in the wall, at first direct, and afterwards as a turnpike, and supplies each floor, reaching finally the ramparts. The basement was the store, and above are state and other chambers. The well, of large size, is in the basement, and each floor has its fireplace and garderobe. The roof was conical, and rested upon an internal wall, outside of which was the rampart walk, protected by an unusually lofty parapet, surmounted by a heavy bold coping, and pierced by twenty-four doorways, intended to open into the timber *brétasche*, while between the doorways are twenty-four loops, intended to be used when the *brétasche* was not fixed. A curious evidence remains of the manner in which this tower was scaffolded. A double row of putlog holes are seen to wind round the tower spirally, in two parallel lines, showing that as the wall rose it was surrounded by a sloping roadway of timber, of which the main beams were thrust into the wall, and supported by struts, the lower ends of which rested upon blocks in the lower holes. A similar arrangement may be seen in the north-west tower of Harlech Castle, commencing at the top of the curtain-wall. So strong was Coucy keep that when, at the command of Mazarin, powder was exploded in its basement-chamber, and the vaultings throughout, thus lifted, fell, the cylinder, though cracked, was not thrown down. This noble example of a thirteenth-century tower has been successfully repaired by Viollet-le-Duc, who closed the fissure, and made the tower apparently as sound as ever.

Nor does Coucy, though the chief of the towers of the thirteenth century, stand alone in its magnificence. Issoudun, known as La Blanche Tour, is remarkable for the position of its entrance-door, and for its well-stair contained in the projecting spur; Tournebut, Cosson, Verneuil, Chinon, Villeneuve-le-Roi, Semur, Alluye, Bourbon-l'Archambault, and Châteaudun, are a few only of the round towers or donjons, scattered over France, and dating from the latter half of the twelfth and from the thirteenth century.

There is a peculiarity in these French towers unknown in England. Where, as at Château-Gaillard, they are exposed on one side to be battered, they are constructed with a projection forming a right-angled salient from the cylinder, which thus becomes keel or boat shaped in plan. This spur has a fine effect, and being usually solid, adds much to the strength of the tower. This projection, of which Roche-Guyon is a fine example, and which ascends the whole height of the tower, is very different from the spur-buttress, by which a round tower rises from a square base. This is especially common in Wales, and may be seen producing a good effect both at Chepstow and Goderich.

Of cylindrical keeps, either of early English or late Norman date, in England, may be mentioned Brunless, near Brecon; probably Caldecot, Monmouthshire; Coningsborough; Dolbadarn, in North Wales; Launceston; Pembroke; Penrice, Glamorganshire; Skenfrith, Monmouthshire; and Tretower, county Brecon. The round tower at Barnard-Castle, a very fine one, already mentioned, is later.

The reign of Henry III., 1216-1272, was long, and that prince was a munificent patron of art, and especially of architecture; nevertheless, and notwithstanding the internal dissensions of the period, the reign produced (excepting perhaps in South Wales) but few original castles, and those not remarkable for grandeur. The cause of this was that the country was already rather overfurnished with castles, so active had the Norman lords been during a century and a half, and the positions of the existing castles being well chosen, and their keeps of a substantial character, it was found better to add to them, when space was needed, rather than construct new ones in new positions. The itinerary of John shows that almost all the great castles of the country were even then built, and the use to which they were so frequently put may well have made the successors of that sovereign anxious rather to destroy than to build. Thus Bedford, a very early and very strong castle, was held by Hugh de Brèanté against the king in person, and was only taken by assault after a vigorous siege of two months, after which it was not only dismantled, but destroyed, its ditches filled up, and the materials of its walls and towers used for other constructions. Sometimes, however, where it was desirable, as in London or at Porchester, or Winchester, or Richmond, to retain the existing castle, either *enceinte* walls or more extended outworks were added, affording more accommodation for troops or for live stock for the garrison. Palisades gave place to walls, and mural towers and gatehouses, of large size and great strength, were added. Sometimes, as at the Tower of London, an outer ward, encircling the older building, was added; in other cases, as at Corfe, Chepstow, and Barnard Castle, the new ward was applied on one side, or at one end. In these augmented castles the keep was still treated as an interior citadel, a last resource or refuge, and was protected by one or two lines of wall, with mural towers, usually round or half round, and by gatehouses, composed of two round towers with the entrance between them, the new area within being proportioned to the importance of the place.

These composite structures are the earliest to which the term concentric is properly applicable. Where the keep is central, and the *enceinte* double, as at the Tower and Dover, the result is a very perfect example of the concentric type of castle, though of course the parts are of different dates. Of Kenilworth, and probably of Bridgnorth, the original arrangement was concentric, although the central part is a ward or walled enclosure, not a single isolated keep tower, which in these is worked into the line of the inner ward wall. As the outline of most castles was materially affected by the disposition of the ground, it is obvious that no classification as regards chronology can be based altogether upon the ground plan. At Alnwick, for example, the outline of which is probably Norman, and to some extent governed by the ground, the keep stands between two wards, and is the connecting part between them, and so at Chepstow and at Pickering; while at Richmond, also Norman, the arrangement is wholly different, as it is at Porchester, where Roman walls have been turned to account.

South Wales contains some castles which appear to have been altogether built, though possibly on old sites, in the reign of Henry III., as Cilgerran, Manorbeer, Grosmont, and Whitecastle. These, especially Whitecastle, are mere enclosures of irregular plan, within a strong curtain wall, supported by mural towers almost always round, and entered between two such towers as a gatehouse. The domestic buildings or lodgings, as the hall, sleeping-rooms, kitchen, offices, and stables, which in a regular English castle were of masonry, in these Border structures, such as Whitechurch, were partly of timber, with flat or moderately-sloping roofs, built against the walls of the area.

In the royal castles, and others the "capita" of estates and seats of the greater barons, great attention was paid to domestic comfort and splendour. The records contain many sheriffs' accounts for additions or repairs for domestic buildings within the castles, for painting the walls in fresco, or filling the windows with stained glass, all showing a vast growth in taste and luxury. More attention, indeed, was paid to these matters than to the military defences, for the castles in time of peace were allowed to fall into disrepair, and scarcely any garrisons were kept up. When a rebellion broke out, and the castles of a district were threatened, the patent and close rolls are filled with orders to the sheriffs, constables, and castellans, to supply timber, nails, lead, cordage, barrels of arrow-heads and cross-bow bolts, calthrops, bow-staves, and now and then military engines, which were collected from all quarters. All, however, was done hastily, and any masonry work erected under such circumstances is generally found to be of inferior quality, and in marked contrast to the masonry of churches and ecclesiastical buildings of the same period.

In the reign of Henry also began to be constructed fortified dwelling-houses, embattled and usually moated, but not regular castles. The invasion of the prerogative, under Stephen, led to its enforcement with strictness in the subsequent reigns, but as there were few new castles, it was chiefly in favour of fortified houses that the *licentia kernellare* was applied for and granted. The earliest extant licence of this character dates from this reign, and about a score altogether appear to have been issued by Henry. Of these, six only were applied for by considerable barons, and in only two cases for castles of consequence, namely, Dudley and Belvoir.

G. T. C.

ENTRENCHMENTS OF THE YORKSHIRE WOLDS.

IN the Anthropological Department, British Association meeting at York, General Pitt-Rivers, F.R.S., read a paper on "The Entrenchments of the Yorkshire Wolds and the Excavations in the Earthwork called Danes' Dyke at Flamborough." The district consists of four patches of high ground separated from each other, and bounded by five principal valleys. Assuming most of the low ground to have been occupied in prehistoric times by marsh and jungle, there would remain only the plateau lands on the hills for the inhabitants to live upon, and here, as might be expected, we find the ground covered with their remains. Flamborough Head and promontory must, of course, have formed the base of operations for warlike purposes in any case, whether of an invading or retreating force. In the former case it would be the first, and in the latter the last, point occupied by any people at war with the inhabitants of the interior. The high cliffs precluding all possibility of an attack by the sea, and leaving only the land side to be attended to, they would naturally expect to find an entrenchment facing westward, and occupying the first suitable position westward. Such an entrenchment they found in what was commonly known as Danes' Dyke, a misnomer, as he would show. The Dyke runs north and south a distance of two miles and a half from sea cliff to sea cliff, and at a distance of three miles from the centre of it to the point of the promontory. It has a ditch on the west or inland side, showing that the enemy was expected from that quarter. It is judiciously chosen, and on the whole commands an extensive view of the country for some distance to the westward. There are twelve gaps through it, some of which are no doubt modern. A small stream coming from the north runs through the entrenchment, affording a supply of water to the defenders. The entrenchment is of nearly uniform height all along, being about 18 ft. above the level of the ground, and having a ditch 60 ft. wide at the outside. Of the defensive character of the entrenchment there could not be the slightest doubt, and it was a work of great strength, probably surmounted originally by a palisade, and implying a large and well-disciplined force for the construction and defence of it. With the exception of two entrenchments between the north end of Danes' Dyke and Speeton, which run from the edge of the cliff southward, and the ends of what have been ploughed out of cultivation, nothing of any consequence occurs in the way of military defence until the great position at the ancient village of Argam. On the north wold an entrenchment runs along the top of the escarpment of the Derwent valley. It originally extended from Hunmanly on the east to above Heslerton on the west, and guarded the north wold hills from an attack from the Derwent valley. A branch from the dyke defends the wold hills from any attack by the north-west up the valley at Wintringham. Behind and parallel to this, two miles in the rear, are double dykes running between Kirby-Grydalythe and Butterwick, also occupying a strong position on the hills toward the north-west. Behind this again, a mile and a half in the rear, are other dykes parallel to the last, running between Sledmere and the hill west of Hewing, also occupying a position for defence against the north-west. Besides these the north wolds are covered with numerous smaller entrenchments. After describing what he considered as the most instructive portion of the whole district, the oolite range to the north of the Derwent valley, which included a system of defence persistently adopted in all prehistoric works in this country, whether camps or dykes, the author described how, with the kind permission of Messrs. Dormer, to whom the ground belongs, he commenced an excavation at the Danes' Dyke, on October 13th, 1879. A number of flints and flint flakes were found, affording evidence that the defenders of the earthwork used flint, and consequently that the work itself was not later than the bronze period, and was, in fact, of the same age as the tumuli of the Yorkshire wolds. They were narrowed to the opinion that the invaders of Flamborough, if invaders they were, were the same people who landed on the south and south-east coast of England, or else that these dykes belonged to the people of the country, who, having imported the bronze culture from elsewhere, were driven to the coast by another and more powerful race who occupied the interior, and that these defences were associated with their last occupation of the soil of Yorkshire. Further than that he did not venture to particularise. He trusted it would be admitted that the excavations and observations he had made landed them somewhat further on the road to knowledge than they were before. Notwithstanding the traditions which connected the place with the Danes, and the prevalence of a Danish element in the population of this country, the traces of which had been so well brought out by Mr. Atkinson in his history of Cleveland, this ground was the scene of operations of a very much earlier people, a people who, though ruder in their culture, were much their superiors in the art of war, formidable in their means of offence and defence, and in the discipline necessary to construct the great works he had been speaking of.

NEW BOARD SCHOOL, OBAN-STREET, TOWER HAMLETS.

AMONG the more recent schools erected by the School Board for London from the designs of Mr. Edward Robert Robson, F.S.A., several changes have become apparent. One is a tendency to increase the size of each school, so that it shall suffice for a larger district and greater number of children, as well as be more economical in management. The question is whether they are not, in some instances, even too large. Another is the adoption of a unit of sixty for class-rooms, capable (where there is no hall) of subdivision into two thirties for the use of pupil teachers. A third is a closer attempt to light as many rooms as possible from the left of the pupil, as is the later German practice. These two last are conflicting in principle and often irreconcileable.

One of the last instances exemplifying these changes is that of the Oban-street schools, Bromley-by-Bow, now in course of erection, of which our illustrations show the arrangement. The site of the building is peculiar, having one frontage on the level of the surrounding streets, and the opposite frontage, at a much higher level, towards the canal towing-path. Taking advantage of this circumstance, Mr. Robson has raised the whole building on arches, thus forming covered playgrounds underneath, the infants' department being approached by inclined planes. The plan of the school, with its great hall, naturally suggests a Gothic treatment somewhat after the type of the Belgian trade-halls. But the *raison d'être* of School Boards is not in harmony with Gothic, and the result is a style of somewhat curious blending, the Gothic *motif* mingling with the usual treatment which Mr. Robson has rendered familiar in his schools.

It will be noticed that there are two staircases for each department. In each case the height of the schoolroom is divided into two floors of mezzanine, approached from the staircase landings, and utilised as cloakrooms and teacher's rooms. The accommodation is for 420 boys, 420 girls, and 560 infants; or a total of 1,400 children.

The building will be warmed by steam-radiators on Leede's low-pressure system of 5 lb. to the inch, supplemented by open fires in some of the class-rooms.

The tender for the erection of the building by Mr. S. J. Jerrard, of Lewisham, amounts to 18,244*l*.

The number of new schools erected by the School Board (exclusive of enlargements) now reaches the remarkable total of 270.

HIGH SCHOOL FOR GIRLS, DOVER-STREET, MANCHESTER.

THIS building, which is almost ready for occupation, has been erected under the direction of Messrs. Mills & Murgatroyd, architects, Manchester, on a site containing about 3,500 square yards of land, in Dover-street, Chorlton-on-Medlock. The school has been carried on most successfully for several years, but the premises formerly occupied by it being inadequate for the purpose, larger and suitably arranged premises, of which our illustration shows the principal front, have been erected. The exterior is faced with pressed bricks, with moulded jambs and arches, while red terra-cotta has been largely employed for sills, strings, water tables, and weatherings; this material has been supplied by Messrs. Johnson & Co., of Keymer Junction, Sussex.

The frontage is 146 ft., and the buildings extend to the rear 160 ft. On the left of the entrance are committee-room and teachers' common room on the ground-floor; museum and library on the first floor; and some of the principal class-rooms above. On the right is the dining-hall, 72 ft. by 31 ft., on the ground-floor, and the lecture-room is above it, covering the same area, but having a lofty open-timbered roof. From the entrance a wide corridor extends to the rear, having on one side class-rooms, and on the other dressing-rooms, &c., the water-closets being in all instances separated from the dressing-rooms by an intervening lobby with cross ventilation. The class-rooms number in all twenty-two, and will accommodate some 550 pupils with an allowance of about 17½ square feet of floor space each. There are, besides, a well-lighted drawing-room, 110 ft. long, a laboratory and chemical lecture-room, large covered play-room, and an excellent cloakroom, fitted up with drying-closet, &c., in which wet garments may be satisfactorily dried during the school hours. Kitchens, &c., are placed near the dining-room, but as the establishment is exclusively a day-school, no sleeping-accommodation has been provided. The committee, however, which, by the way, we may mention is composed of both ladies and gentlemen of position in Manchester, possesses some 1,500 square yards of land to the left of our view, on which any extension that may be desirable can hereafter be carried out. Messrs. W. Southern & Sons, of Salford, were the builders.

DESIGNS FOR DATE TABLETS.

THESE designs for carved date tablets could be used for stone, brick, terra-cotta, or wood, with more or less of detail, according to the material in which they might be carried out. Of course, it is understood that the highest finish would be given when used in wood, and the drawings published are finished up for their use in that material, which, when in position, will be for interior work, and therefore not only nearer the eye, but removed from the damaging influence of the elements. In this case, as they would be chiefly used for small panels in furniture, over mantels, doors, &c., they would seldom be required larger than 6 in. or 8 in., and for general use would probably be of smaller dimensions. But for stone and brick they would very seldom be less than 10 in. or 12 in., and require much less detail, being carried out in a bold and free handling. As they would be seen from a distance, all delicate work would be lost, and, moreover, soon rounded off, by exposure to the changes of our climate.

Some short time ago, while passing a row of well-built detached houses in the modern Queen Anne style, it was seen that the date tablets on each house, although well carved and placed in a most conspicuous position, were all alike; and the question arose where the advantage lay in repeating this hand-work.

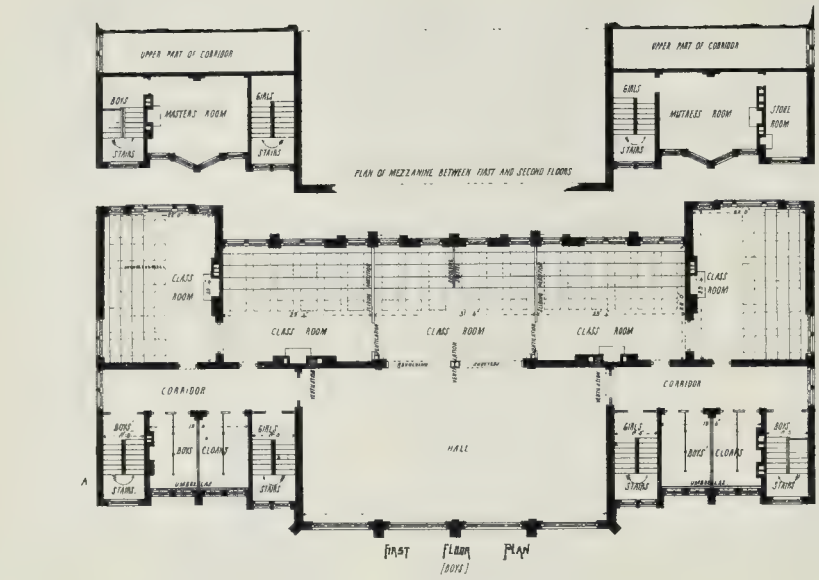
We talk a great deal of the care and spirit infused into the old work, and, while condemning our own workers of to-day, seem to forget that those old workers repeated very little in comparison to the change of design they carried out; while, on the contrary, it is quite the exception for the mason or smith of our time to have anything to do but a constant repetition of a few accepted forms. Can we, therefore, justly complain if he becomes an indifferent machine?

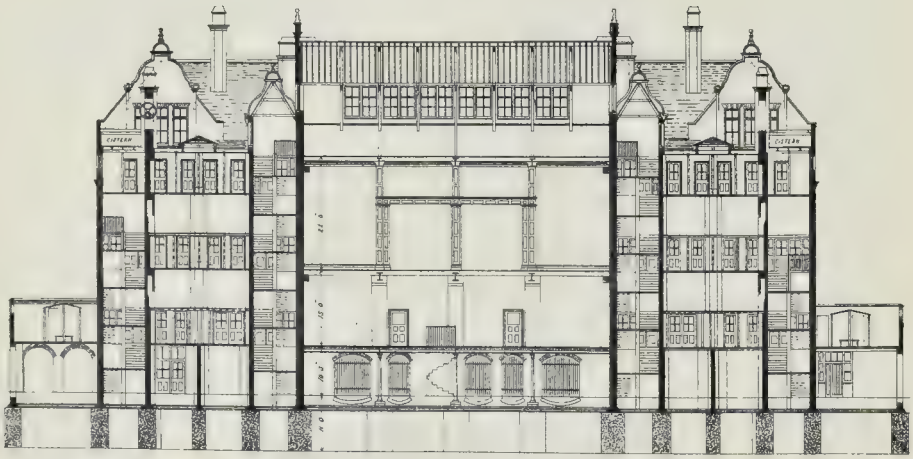
Mr. Lewis F. Day wrote some time ago an interesting article, showing the reasons why a man's house is less his home than it should be. He confined himself to interior decorations and their influences, but we cannot help thinking that our architects can help us quite as much outside as we can help ourselves inside in making our houses our homes, and creating proper pride of possession. If we seek a reason, and one quite outside the question of art or good taste, which are synonymous, is it not a very pardonable vanity in Brown to wish his house somewhat different to Smith's?—a desire for it to possess some individuality, trifling though it may be?

As regards the architectural fabric itself, the actual building, one must perforce accept the inevitable with the best grace possible, if we do not possess the means of indulging in a house built after our own heart; but there are little accessories which go to complete a building, and give it character, as in the fan-light, wherein thought of the future occupier might



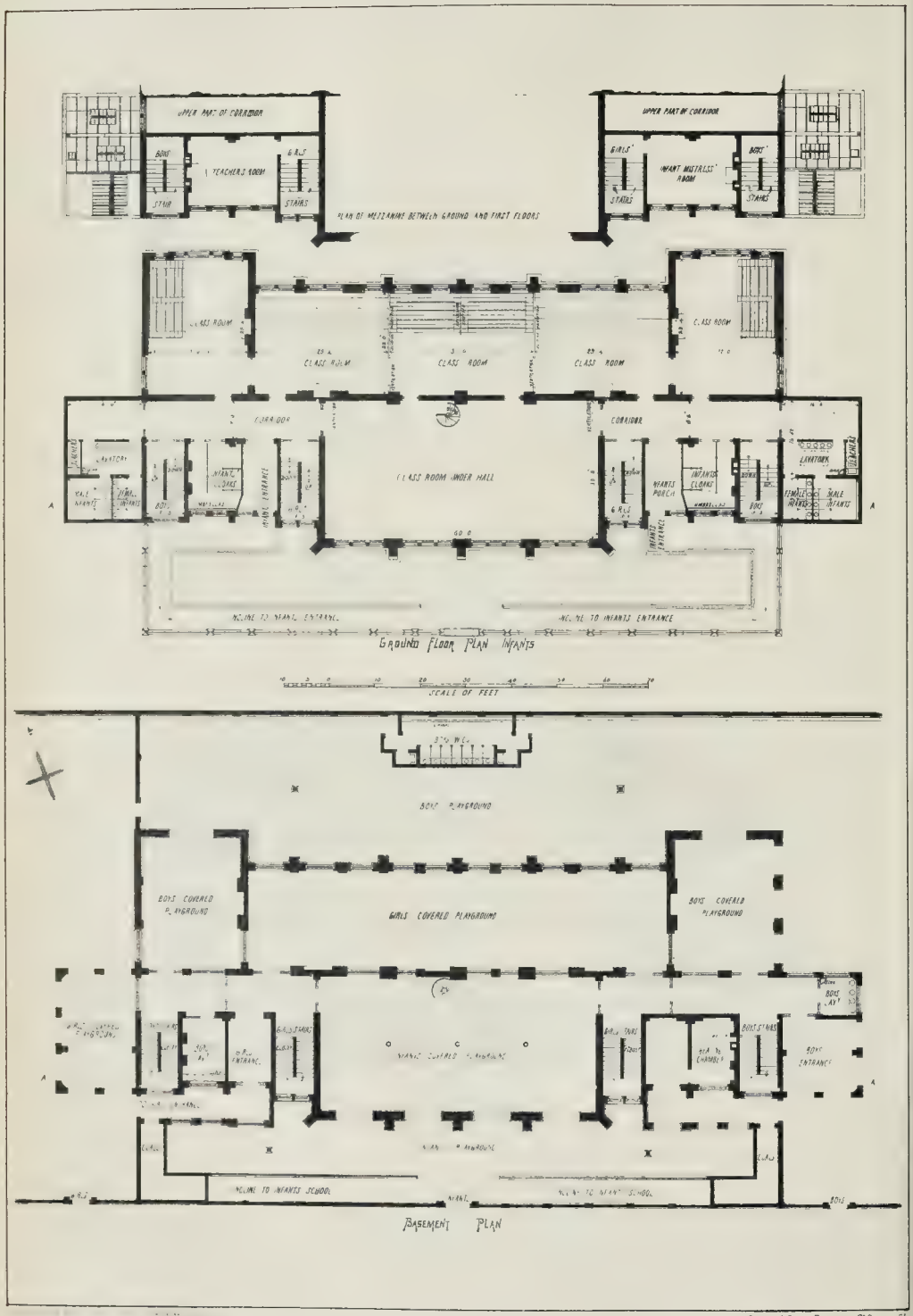
OBAN STREET BOARD SCHOOL, TOWER HAMLETS.—Mr. Edward Robert Robson, F.S.A., Architect.





Wh terman & Bass, Photo-, 236 Heathcote Street, Leeds.
Wyman & Sons, Printers, Great Queen St.

OBAN STREET BOARD SCHOOL.



Wyman & Sons Printers C^t Queen S^t

OBAN STREET BOARD SCHOOL.



HIGH SCHOOL FOR GIRLS: DOVER-STREET, MANCHESTER —Messrs. Mills & Murgatroyd, Architects.

Wyman & Sons Printers 74 Queen St





C. F. Kell, Photo-Litho Castle St. Holborn, London, E.C.

Wyman & Sons Printers, Great Queen

DESIGNS FOR DATE TABLETS.—By Geo. Chas. Haite.



A STREET IN ROTHENBURG, GERMANY.

well be considered. The breaking-up of the door, the date tablet, the small stained-glass window over the porch, the grille in the gate, &c., these need not surely be all alike, and thereby the end and aim almost of their adoption defeated. The expense entailed would be small, and chiefly for the designs.

A STREET IN ROTHENBURG, GERMANY.

IN the references we frequently have had occasion to make to the very interesting ancient town of Rothenburg, we have chiefly confined our remarks to the general aspect of the place, to the most perfect system of ancient fortification to be seen there, and to the churches. We now propose to say a few words about the domestic architecture.

Although Rothenburg does not present to our notice any very early example of civil or domestic work, yet the specimens of the latter are very numerous, and far from uninteresting. The illustration which we give of a street in the town includes several interesting peculiarities. The treatment of the lofty gable of the house shows that the roof has been intended for a store-place or warehouse, and the doors for the admission of goods are treated in a remarkably ornate manner. We find amongst the enrichments that bold treatment of the pelleted cable moulding which is one of those singular recollections of Romanesque detail never quite abandoned by the Germans. We also see the interpenetrating cusps, a feature peculiar to late German work. The charming little angle oriel, or, as the Germans call it, "esker," at first appearance seems to belong to a somewhat later period, but in all probability it is of the same date as the rest of the building. It is very interesting from the fact of its retaining its original glazing and tiled roof. The tiles are glazed, and are green, yellow, and red in colour. There is a somewhat marked absence of sculpture about the old houses in Rothenburg, which will be at once noticed in the example we give. This probably arose from the fact that the town, which was one of the "Cities of the Empire," adopted the faith of "the Augsburg Confession" at an early period.

The apse shown in the distance in our view is the western choir of the great Church of St. James. This choir is raised up many feet above the nave of the church, and forms a kind of western gallery. At present it is used as an organ gallery, but probably before the Reformation it was furnished with regular choir-stalls, with an altar, arranged basilica fashion, as we see in the cathedrals of Augsburg and Naunberg. These western choirs are peculiar to Germany, and probably led to the western choirs and organ galleries which became common over the whole of Northern Europe in the seventeenth and eighteenth centuries.

SANITARY PROGRESS.

SIR,—I should be glad if, for the information of those engaged in sanitary works, you could find room for this revised copy of a letter of mine showing some of the economical results obtained by them:—

The extent of the excellent papers, and of the discourses on purely medical or curative science at the International Medical Congress, precluded more than very slight attention being given to sanitative or preventive science, and prevented a notice of the means of the reduction of a percentage of sickness or death-rate by it, or by curative science. Since the congress was held the report of the Local Government Board has appeared, and contains a statement of the progress of sanitary work in England and Wales, to which public attention may now be well directed both in justice to the subject and to the services of the new local health officers appointed, and acting, as yet, with very imperfect attributions and functions. The statement of the report is as follows:—

"Before concluding the part of our report which relates to sanitary administration, it may be useful to draw attention to the annual death-rate for some years past as indicating the effect which recent sanitary measures would appear to have had upon the public health.

The following table shows the death-rate for each of the four last decennial periods:—

England and Wales.

Annual Death-rate per 1,000.	1841-50.	1851-60.	1861-70.	1871-80.
All causes.....	22·4	22·2	22·5	21·5
Seven zymotic diseases	—	4·11	4·14	3·36
Fever.....	—	0·91	0·88	0·49

From the above figures it will be seen that, speaking generally, the death-rate of the country remained stationary from 1840 to 1870, but that in the period 1871–80 it fell from 22·5 (of the previous decade) to 21·5, a reduction equivalent to nearly 4½ per cent. It may, therefore, be roughly estimated that about a quarter of a million of persons were saved from death in the ten years 1871–80, who would have died if the death-rate had been the same as in the previous thirty years. If twelve cases of serious but non-fatal illness be reckoned for every death, it follows that about 3,000,000 persons, or over one-ninth of the whole population, have been saved from a sick bed by some influences at work in the past decade, which had not been in operation previously. The case, indeed, is still stronger than this. The death-rate of rural districts is habitually lower than that of urban districts; and as the population is steadily concentrating itself, more and more, into the towns, the death-rate of the whole country would tend to increase, if the other circumstances affecting it remained the same. When we find that this tendency has been so much more than merely counteracted, it becomes interesting to see where the gain has been; and to endeavour to trace some of the causes to which it may be due.

Comparing, then, 1861–70 with 1871–80, it will be seen from the foregoing figures, that of the entire reduction of 1·0 in the death-rate, more than three-quarters (4·14—3·36=0·78) comes under the head of 'The Seven Zymotic Diseases'; of the diseases, that is, which are most influenced by sanitary improvements, and most amenable to control by the action of sanitary authorities. And of this three-quarters just half (0·88—0·49=0·39), or three-eighths of the entire reduction, is in 'Fever,'—the disease which, more than any other, shows itself in connexion with such faults of drainage, of water supply, and of filth accumulation, as it is within the province of good sanitary administration to remove.

It is particularly significant that, since the year 1870, when the fever death-rate was 0·80 per 1,000, it has fallen pretty steadily, year by year, as follows, down to 0·32 in 1880:—

1871.....	·70	1876.....	·44
1872.....	·61	1877.....	·41
1874.....	·53	1878.....	·42
1874.....	·59	1879.....	·31
1875.....	·55	1880.....	·32

Thus in the five years, 1871-5, the fever death-rate was 0·61; in the five years 1876-80 it was 0·38."

During the decade from 1861 to 1870, there appeared to be no gain from the outlay on sanitary works or on sanitary service in England and Wales; but since then the service appears to have made an effective start, and the pecuniary gain may be thus stated:—Under the inquiry as to interments, the cost of funerals,—all round,—was ascertained to be 5*l.* each. The gain under that head will, therefore, be about one million by the quarter of a million of funerals saved during the last decade. The direct cost of sickness has been estimated at about 1*l.* per case. The gain under that head during the decade will, therefore, amount to about three millions; a gain, that is to say, of medical treatment and other expenses. But the gain to the wage classes, from the saving of lost labour, will have been far greater. Dr. James Watts, who has had great experience in friendly societies, states the average loss of working time at two working weeks and a half per member between twenty-one and seventy years of age, and he estimates the total loss to the wage classes, by the loss of work through sickness, at upwards of thirteen millions per annum. The gain derivable from sanitation may be further illustrated from its advance in military service. The first British army went out to the Crimea under the established curative or medical service, and it was lost. Sanitary Commissioners, trained in service under the first General Board of Health, were then sent out to reform the condition of hospitals and camp, and within three months reduced the sickness and mortality from a plague-rate down to an ordinary standard of health, and by the end of the summer of 1855, to a rate lower than that of the best hospitals at home; and the War Minister declared in Parliament that by the application of their science the second army had been saved. Since then, the Army Medical Department has applied extended sanitary operations. Their exercise under great difficulties is best shown in India. Formerly the death-rate in the Indian army was 69 per 1,000 per annum. The average mortality from 1869 to 1878 was only 20·41. There was, therefore, a gain of 48·59 per 1,000; or, on the present force out there, a gain of 2,350 men. The death-rate of the army at home was formerly 18 per 1,000. In the year 1879 it was 7·55, being a gain of 10·55 per 1,000. As the strength of the army in 1879 was 80,700, the gain was 843 per annum. The total gain to the army in India and the army at home, and the rest of the army, will be 3,443 men per annum. As each soldier is estimated at 100*l.*, this represents in money value 344,000*l.*, or more than a third of a million. It is not very easy to get at the real amount of the sickness, but the total gain, including the diminished death-rate, is considered to be under-rated at half a million per annum.

The total number of men killed on the battle-field and on the deck, including those killed at Waterloo, Trafalgar, and the most severe battles during the twenty-two years' war, was, according to the Army returns, 19,796. The lives saved from premature destruction by the civil sanitary service, during each of the ten years of the decade, was 25,000. The wounded during the twenty-two years' war were 79,709; but, taking a serious sickness as equivalent to a wound, the achievement of the sanitary service has been, during the same period, some three millions of cases saved by the civil sanitary service. The deaths by steam explosions, in mines and on railways, amount to about five thousand annually, but the lives saved by the civil sanitary service in England and Wales are five-fold greater than the lives thus destroyed by civil accidental violence. A reduction of the death-rate by 4½ per cent. is only an instalment of sanitary progress. Thus, in the instance of Croydon, visited by the delegates of the Congress, the death-rate has been reduced from 25 to 16 per 1,000, chiefly by the methods introduced by the first General Board of Health, by which spring supplies of pure water are carried into the houses, and the fouled water carried at once out of the houses and out of the town, by one Local Board authority, while all putrescible matter, instead of remaining for months and years in conditions of putrefaction, is undecomposed, and flows upon the land within two hours. So in Salisbury, Leamington, and a number of other places. At Croydon, it has been stated by Dr. Alfred Carpenter that, by complete sanitation, the death-rate might be reduced to 10 in a thousand. In the metropolis the death-rates amongst the wage classes in their common dwellings is upwards of 30 per 1,000. In the model dwellings in London, it is, however, about 16 or 17, even with surrounding deteriorating conditions. On the demonstrations of various model instances, it may be held that the reduction of the general death-rate by 4½ per cent., as reported, satisfactory as this is, cannot be considered more than one-third of the results obtainable by advanced sanitary administration and further sanitary works. The pain and misery, and the social disorder, occasioned by excessive sickness and premature mortality, are generally beyond pecuniary estimation. Such estimates as those given serve to show the money loss incurred, by inattention to the continuance of preventible physical evils.

EDWIN CHADWICK.

THE NEW INFIRMARY AT BOLTON.

THE new Infirmary at Bolton, opened on the 5th inst. by the Earl of Bradford, is at present the scene of an important exhibition of fine art. On the occasion of the opening, Mr. T. H. Winder (one of the hon. secretaries) submitted a report showing the origin and progress of the scheme for the erection of the new buildings. Practically the scheme originated in March, 1879, when, at a meeting of the subscribers, the Rev. Canon Powell intimated that he was authorised by a gentleman who desired his name to be kept secret to offer 5,000*l.* towards the endowment of a children's ward in connexion with a new infirmary. The anonymous donor proved to be Dr. S. T. Chadwick. At the same meeting another munificent contribution of 5,000*l.* was offered by the firm of Messrs. John Musgrave & Sons, of which the present mayor is the head. The old infirmary, in Nelson-square, was partially erected in 1824, at a cost of 1,300*l.* In 1838 and 1864 it was enlarged at considerable cost, the most recent of these additions being the construction of another story. Originally the institution was purely a dispensary, but from 1838 the institution included in its benevolent operations the purposes of an infirmary as well as a dispensary. As the old infirmary had been known for many years to be inadequate for the needs of the town and district, it was decided in 1876 to venture upon the establishment of a new infirmary and dispensary. A site forming part of the Bridge House Estate, adjoining the public park, and containing about 23,300 square yards of land belonging to the Ecclesiastical Commissioners and the Earl of Bradford, was secured on favourable terms, and competitive designs were obtained and exhibited to the general public. The committee submitted the designs to the judgment of Mr. Charles Barry, the then President of the Institute of British Architects, who recommended the first premium to be awarded to Mr. R. K. Freeman, of Bolton and Derby, who was accordingly selected as the architect of the new infirmary. The private donations, paid or promised, obtained through the instrumentality of the general committee, from the gentry and tradesmen, including about 7,300*l.* on endowment account, amount to upwards of 33,000*l.*, whilst by the devoted labours of the working men's committee, upwards of 1,300*l.* has been realised from the operative classes towards the new institution, in addition to 676*l.* produced by the Hospital Saturday collections in May last towards the working expenses of the infirmary. In May, 1880, the late Mr. Selim Rothwell suggested to the New Infirmary building committee the advisability of holding an exhibition of works of art in the new institution and in aid thereof; similar exhibitions in aid of the dispensary in 1850 having been very successful. Mr. Rothwell pleaded earnestly for a repetition of the experiment on an enlarged scale, and his proposal having been favourably entertained, a fine art committee was constituted. The committee commenced their labours by securing the patronage of members of the nobility, besides the gentry of the town and neighbourhood, and in order to establish a feeling of security and provide against any possible loss, a guarantee fund of nearly 2,500*l.* was subscribed for by those interested in the movement. The work of soliciting loans of pictures from collectors and artists then commenced in earnest. At first the promises of support were tardily given, but by degrees, through the constant exertions of Mr. Rothwell and several members of the fine-art committee, the numbers gradually increased until the middle of July, when upwards of 1,000 were entered as ready to be delivered to the exhibition committee. The work of collecting commenced on or about the 28th of July last, and by the 8th of August so many paintings had arrived that the committee determined to commence the selection and hanging at once. The collection obtained consists of about 1,600 paintings,

etchings, engravings, pieces of sculpture, and bronzes, which have been hung and arranged in thirty-one rooms and five corridors, and although some of the rooms are small and others not well lighted or adapted for such an exhibition, it is believed that on the whole the most has been made of the resources of the building. In addition to the above, the committee have been successful in obtaining the loan of collections of art pottery, coins, ancient armour, and a splendid collection of articles contributed by Messrs. Elkington & Co. The Science and Art Department, South Kensington, have also lent a valuable and interesting collection of objects of art in six separate cases, containing specimens of enamels, porcelain, carvings in wood and ivory, and a variety of Indian and Spanish textile fabrics. The committee have been successful in obtaining probably the best collection that has been exhibited in the neighbourhood since the memorable Art Treasures Exhibition in Manchester in 1857. It is to be hoped that it will not only be a pecuniary success, and so of help to the Infirmary, but that it may prove of lasting benefit in the development of a more appreciative taste for art.

THE PATENT LAWS.

THE SOCIETY OF ARTS' PATENT BILL.

Sir Frederick J. Bramwell, F.R.S., brought forward this subject at York. He said, after giving a history of the Bill,—The need of a patentee in the development of an invention was the first point the committee kept before them. The second point the committee had in view was that, so far as possible, the connexion between lawyers and patents should be severed. There can, I think, be little doubt that whether in regard to the original granting of patents, or in regard to their amendment, or in regard to the trial of patent actions, lawyers are the persons least adapted to perform these functions properly. No one entertains a more sincere respect than I do for the Bench and the Bar of England, and I wish, in the interests of that respect, to see them discharged of functions which most certainly they ought never to have had thrust upon them. Fortunately, having regard to the magnitude of the transactions involved in patent matters, there is but very little patent litigation. In the year 1874 it was ascertained for me that there were, upon an average, only nine patent actions which went so far as to be heard by a Court of First Instance in each year, and I have no reason to suppose that that number has materially increased, if, indeed, it has increased at all. But with respect to the few actions that are tried, a very considerable part of the expense arises from the elaborate models which are needed to instruct counsel upon the subject, who themselves have to inform both the court and also the jury, where there is one. And further, commonly, notwithstanding all the expense that has been gone to, and the pains that have been taken, the litigants have the chagrin of seeing that they have not been successful in making themselves understood either by the court or the jury, or, it may be, not even by their own counsel. The first proposition of the Bill is that there should be appointed, in lieu of the present Commissioners, who are all legal officials, a body of commissioners, one of whom should be well acquainted with engineering, one with chemistry, and one with law. Power is given to the commissioners, with the approval of the Treasury, to appoint the needful staff. It is intended that these commissioners should be the persons to grant patents, after a slight examination by examiners, not as to novelty, not as to utility, not as to sufficiency of invention, but simply to ensure that the necessary forms are complied with, and that a sufficient description is given. The commissioners, also, are those who would hear opposition, which it is proposed to confine to those persons who allege that the invention has been fraudulently obtained from them. They are also those who would consider as to amendments, and as to prolongations; and it is intended that both amendments and prolongations should be made more easy than they are at present. And, finally, it is the commissioners who would hear patent causes. This remitting to the commissioners of the trial of patent causes, probably is the most thorough change made by the Bill. Among the other provisions, the procedure has been modified, with the object of helping the patentee to obtain his patent more easily than at present, and more cheaply, and also with the object of rendering the patent more secure when he has once obtained it. The committee who framed the Society of Arts' Bill are of opinion that it is contrary to the interests of the public that a patentee should be deprived of his invention by what, after all, are technicalities. Further, it is a very common thing for a patentee to obtain provisional protection, and having done so, either through being too much occupied with other matters, or through being incompetent to develop his own idea, to abandon the further proceeding with the patent, and to allow his provisional protection to lapse, and thereupon the provisional specification is made public. I believe I am right in saying that something like 30 per cent. to 40 per cent. of all the inventions for which provisional protection is obtained do not go beyond that stage. The result is that there is made public, legally speaking, a mass of crude and undigested matter, always useless to the manufacturer, but commonly destructive of the novelty of a patent which might come afterwards and be fully worked out by an inventor. The committee propose that the provisional specification should be a merely temporary document, that it should never be made public, so that whether a patent be granted, or whether the provisional protection be suffered to lapse, the document should be destroyed. Similarly, it appeared to the committee that it was inexpedient a patent should be rendered invalid by any dormant publication, such as a book in the British Museum, and therefore they propose that unless an invention can be proved to have been in use within thirty years, no mere publication, unaccompanied by use, should be considered an anticipation of a patent. With respect to the term of a patent, it will be seen that the committee suggest the American term of seventeen years, coupled with the power of prolongation for a further eleven years. The term of seventeen years has been taken, coupled with this power, in preference to the term of twenty-one years proposed in the Government Bill of 1879, unaccompanied by prolongation, as the committee deemed that seventeen years, if the patent was successful, would afford the patentee sufficient remuneration, and also that having once established a body competent to deal with patent matters, there would no longer remain the difficulty of obtaining satisfactory decisions in cases of prolongation. The scale of fees proposed in order to obtain a patent is that of the Government Bill of 1879, and, as regards the subsequent payments, is practically the same as was proposed in that Bill.

Sir Antonio Brady, president of the Inventors' Institute, said that in his opinion the Society of Arts had done a most excellent work in bringing forward this Bill. He considered that taxation ought to be general, and that the brain-power upon which rested the prosperity and industry of the country should not be overtaxed. The Patent Law of America should be more their guide, and the Office should be made to render assistance to inventors. At present the register was so imperfectly kept that there was a difficulty in ascertaining when inventions had been patented, and provision ought to be made for preventing inventors running their heads together and going to law. If the proposed Bill were passed it would be impossible for two men to get a patent for the same invention in one day. The Bill was one that would recommend itself to the Inventors' Institute, and he should avail himself of an early opportunity of asking them to take it into their consideration and give it their support. The Society of Arts had done a marvellously good thing in bringing forward this Patent Bill. It is a mistake to think, as some people did, that patents were monopolies. He considered the country was very much indebted to Dr. Siemens for bringing his inventions over here. Although the patent laws of England gave more encouragement and aid to inventors than those of Germany, still they required much alteration. In America a patent was in reality property, but here it was a licence to go to law. In this respect he did not see why it should be different to the copyright law. With regard to the duration of the term of a patent, he did not see why it should not be twenty-one instead of seventeen years. If the Bill became law it would give a great impetus to the trade of this country. He thought the attention of the committee might be called with advantage to the desirability of reducing the fees so as to bring them within the limits of the working man.

Dr. Siemens said the Bill was the result of careful consideration and discussion by the committee, of which Sir F. Bramwell was the chairman, and he thought the best thing would be to take it *en bloc* rather than for the meeting to suggest any minor alterations.

THE SAVOY THEATRE.

This theatre, which is advertised to open on Monday, October 3rd, has been erected for Mr. D'Oyly Carte from the designs and under the direction of Mr. C. J. Phipps, F.S.A., architect of the Gaiety, the Haymarket, Princess's, and other theatres. It is situated on the west side of Beaufort Buildings, Strand, and occupies a site absolutely isolated on all four sides, thus affording free and expeditious entrance and exit for all classes of the public. The entrances are thus distributed, and are arranged so as to utilise the peculiar levels of the site.

For the stalls and dress-circle, and for all persons coming in carriages, the entrances are in Somerset-street, just off the Victoria-embankment. The pit is also entered here, and there is an entrance to the upper circle; the audience for both these latter parts can come direct from the Strand, by a short flight of steps adjoining Beaufort House. In Beaufort Buildings also is an entrance to, and on a level with, the upper circle. The entrances before referred to from the Embankment are on a level with the dress circle, and a few steps lead down to the stalls and pit.

The gallery is entered from Carting-lane, a street in a direct line from the Embankment to the Strand. The royal entrance is at the angle of Somerset-street and Carting-lane. The stage entrance is in Herbert's-passage. The box-office for booking seats during the day is situate close to the Strand, at the angle of the Beaufort-buildings frontage. The manager's offices are also entered from Beaufort-buildings.

The theatre is approached from Somerset-street through a semicircular vestibule, paved with black and white marble, in which are the offices for booking and obtaining seats in the evening. Doorways immediately opposite the entrances lead to the dress-circle corridor, out of which wide staircases will be found on both sides of the theatre leading to the stalls. From this vestibule are also means of communicating by an ascending staircase with the upper circle, and by pass doors to the pit staircase.

All the entrances, passages, and staircases are of fire-resisting materials; the flights of stairs are supported at each end by solid brick walls, and each staircase has a handrail on each side. There is no part of the theatre that has not two means of both ingress and egress, and the stage is separated from the auditory by a solid brick wall taken up completely through the roof. Water laid on from the high-pressure mains is in several parts of the theatre, and every possible means has been taken to ensure both the comfort and safety of the audience.

On the floor below the vestibule is a large refreshment-saloon for the pit, and contiguous to it a smoking room opening out of the stalls corridor, with a separate boudoir lounge for ladies. There are also refreshment-saloons on the upper floors of the theatre, for both the upper-circle and the gallery, with all necessary retiring and cloak rooms.

The auditory is thus arranged:—On each side of the stage opening (which is 30 ft. wide by 32 ft. high) are three private boxes on each of the three levels; these are divided by partitions and ornamental pillars, and are surmounted by an arch spanning the whole width of the proscenium, springing from a cornice on a level with the gallery front. These boxes are upholstered in hangings of gold-coloured embossed satin. The orchestra is in front of the stage, and is of sufficient capacity for a full band of musicians.

There are nine rows of stalls on the level of the orchestra, seated to hold 150 persons in arm-chairs, with ample space allowed for passing between the several rows, and wide unimpeded gangways on each side to the entrance-passages. Behind the stalls are six rows of pit-seats, calculated to seat 250 persons, with a spacious open corridor behind, for standing and promenading. Above the pit, but at sufficient height to allow of persons at the very back seeing the full height of the scenery, is the dress-circle of six rows of seats, with arm-chairs for 160 persons. There are no pillars of any kind in the dress-circle, so that a clear unobstructed view of the stage is obtained from every seat. Above

the dress-circle, but receding some 9 ft. back from it, is the upper circle, seated to accommodate 160 persons in five rows. The amphitheatre and gallery recede 5 ft. behind the upper circle, and will seat 400 to 500 persons in eight rows. In each tier the balcony-front takes the form of a horseshoe, that being considered by the architect the best adapted for perfect sight of the stage.

The ornamentation of these several balcony fronts is Renaissance in character, and is elaborately moulded and enriched with the figures and foliage peculiar to the Italian phase of the style, and gilded. The ceiling over the auditory takes the form of an extended fan from the arch spanning the prosceniun, and is divided into a series of geometric panels modelled in Renaissance ornament in relief, of the same character as the box fronts. Colour is sparingly used in the ceiling, the background of the ornament only being painted a pale yellow. The proscenium arch is divided by ribs into a series of panels, with gilded ornament. Over the proscenium, in the tympanum of the arch, is a *basso-relievo* of figures and ornament upon a gold ground. The walls of the auditory are hung with a rich embossed paper, in two tones of deep Venetian red. The seats are covered in peacock blue, plush being used for the stalls, and stamped velvet for the dress-circle. A gold-coloured satin curtain takes the place of the usual painted act-drop.

The stage, which is laid with all the latest improvements in mechanical contrivances, is 60 ft. wide by a depth from the float lights to the back wall of 52 ft.; there is a clear height above the stage of 56 ft. for the working of the scenery, and a sink below of 15 ft. Behind the stage, and occupying the whole wing of the building in Herbert's-passage, are the dressing-rooms and offices of the management.

The theatre is fitted with a complete system of gas-lighting, but this is only for use in case of emergency, the whole of the illumination for all parts of the establishment being by means of electricity; this has been undertaken by Messrs. Siemens & Co., and the lights adopted are those introduced by Swan, of Newcastle, and known as the "Swan Incandescent Light," the power necessary to generate the electric current for so many lights being supplied by powerful steam-engines placed in a separate building on the vacant land adjoining the theatre. These "Swan" lights are of a beautiful colour, and in no way impare the atmosphere of the theatre, and emit no heat; they are not of the piercing brightness of the electric light as seen in the streets and elsewhere, and, therefore, are not unpleasant to the eyes. This is the first instance of a public building being lighted permanently in all its departments by the electric light.

The exterior façade of the theatre is in Somerset-street, facing the Victoria Embankment, and both this and the Beaufort-buildings frontage are built of red brick, with Portland stone for all moulded parts, and are Italian in style.

The contractors who have been engaged upon the works are as follow:—

Patman & Fotheringham, for the whole of the builders' work, including the stage. Collinson & Lock have arranged the scheme of colour for the interior, and have executed the papering, painting, and gilding, and have supplied the upholstery and carpets; they have also modelled and executed the plaster ornamentation, in conjunction with Geo. Jackson & Sons. Strode & Co. have fitted up the gas arrangements. C. Wadman has manufactured the armchairs for the dress-circle and stalls. Burke & Co. have laid down the marble floor of the vestibule. C. Drake & Co. have executed the concrete floors and staircases. Faraday & Son have made the internal fittings in connexion with the electric lighting. Merryweather & Sons have supplied the fire-hydrants and other such appliances. Clark & Co. have constructed the revolving iron shutters and blinds at entrances.

Mr. J. E. Walker has been the architect's clerk of works.

The Town of Swansea has lately decided on filling the east window of St. Mary's Parish Church with stained glass, to commemorate the meeting of the Church Congress held there in 1879. The subject chosen is "Christ's Sermon on the Mount," and the execution of the work has been entrusted to Messrs. Mayer & Co., of New Bond-street.

PUBLIC WORKS AT IPSWICH.

IN addition to the public works lately described by us as having been carried out at Ipswich, we may usefully give some particulars of the new sewerage works, and of the new hospital for infectious diseases, both recently opened.

The Sewerage Works.—Ipswich has for many years been regarded as in an almost dangerous state, on account of a deficiency or absence of sewerage works. This was not only inconvenient, but the death-rate of the borough has, it is said, been higher than it should be, and considerably higher than it would be if proper drainage had been provided. This is a question upon which many years' consideration and discussion have been expended; and, indeed, it is just a quarter of a century since the Corporation began to talk of providing a sewerage system at Ipswich. Mr. Bruff was the first engineer consulted, and he drew up the very scheme which has now been adopted in substance, after consideration of a rival scheme for sending the refuse of the town on to a sewage farm on Nacton Heath. Part of Mr. Bruff's plan was to construct an intercepting sewer along the low-lying parts of the town to the river, at the Cliff Bight, and thence along the foreshore, past Hog Highland to the London Hard. Tenders were advertised for for the execution of the works, and Messrs. Pearson & Son, of Broomfield Works, Bradford, were the successful competitors. Messrs. Pearson at once set about the work, and in October, 1879, a commencement was made in the bed of the tail stream of the Gipping, at its commencement near Bird's Gardens. That tail stream (says the *Ipswich Journal*) had long been an abomination and an eyesore to the people of Ipswich; it conveyed a stream of filth and refuse to the Orwell, and was usually stigmatised as the open sewer, —a name which it well merited. The sewer here was 4 ft. by 4 ft., and far greater difficulties were met with in this part of the plan than had been expected. A thin deceptive crust had been formed, and it was found when the work was commenced there that the bottom was so rotten that much expenditure was needed for concrete, piles, &c., to fill up the great holes, in which were then only foul, oozy mud. Soon after the works had been commenced at this end, the outfall works were begun at the other extreme of the sewer, and here again the variable nature of the soil, and the depth of the ooze, greatly increased the difficulties beyond what had been expected, and the result was that it was not until some time after the rest of the sewer had been completed that the outfall works were ready for use. A portion of the site of the works had to be reclaimed from the foreshore of the river, and the depth of the ooze rendered this a work of considerable difficulty, as it absorbed large quantities of the earth which were thrown upon it to make the embankment. However, the embankment was completed in about six months, and the making of the sewer from that end was then proceeded with. No fewer than 400 men and 30 horses were employed upon the works, which made rapid progress, and the two ends of the sewer began to approach rapidly towards their point of union. The sewer is carried past the Greenwich Farm, along the foreshore, through the shipyards, past the Ship Launch Inn, and thence straight past the Gas Works. Thence it passes through St. John-street and Duke-street to the Fore Hamlet, into Fore-street, along which it was carried until it reaches Salthouse-street, and the works were then carried through into Key-street, past the Custom House, into College-street, across St. Peter's-street, into Grey Friars-road, and then through Mr. Cole's to the bed of the old Gipping tail stream, where it met that part of the sewer which had reached that spot from the upper end. The whole line of the sewer was thus completed last Christmas. The entire length is 2½ miles, and its size is increased towards the lower end from Lower Orwell-street, where it is 5 ft. by 5 ft., until it reaches the outfall works, at which point it is 11 ft. high. Almost the whole way along its route great difficulty has been caused, owing to the nature of the soil, much of it, even in the town, having been formerly subject to the influence of the tides, and it has been necessary to strongly shore up its side with timber for the safety of the houses on each side. The soil has generally been sand and gravel, and on the foreshore there has been ooze or slob to contend with. John-street was the only part of the work where the contractors had a continuity of strata of any length, but there there were still greater difficulties to be dealt with; and all through, the variable and bad quality of the soil, with frequent presence of water, threw great difficulties in the way of the undertaking. All the old sewers met with in the work were carried into the new sewer, and a temporary outfall was made near the Greenwich Farm to discharge the sewage while the outfall works were in progress. The outfall works were not completed until some time after the sewer, and the great difficulties which were met with there caused that work to be longer in hand than the rest. The outlet is 4 ft. above low-water mark; therefore, the water will have to stand and collect for a considerable part of the day in two reservoirs which have been constructed to receive it. The outlet to the river will be closed to keep out the tide, and five hours per day will be ample time for the discharge of the sewage of the town. The sewer will collect the refuse for the greater part of the day, and discharge it into the river when the tide is two-thirds ebb. The sewage first flows into a large brick chamber through a sluice-door or penstock, and round this chamber are various other penstocks leading to different parts of the works. Two of the penstocks will admit the sewage into the two large brick underground reservoirs. Each of these vaults is double-arched along its entire length (450 ft.), and each one is capable of holding 600,000 gallons. Here a great deal of the solid matter will settle, and the liquid will be poured from it to the river, but the best account to which to turn the sludge which will be left is a problem which as yet remains to be solved. Adjoining these covered reservoirs are two large tanks, each made chiefly of concrete, the larger of which will hold 1,000,000 gallons, and smaller 750,000. All rainfall will find its way to these works, and these two tanks are constructed solely for the purpose of providing for any extraordinary flow of water that may be thus caused. Messrs. Pearson & Son have fully carried out the provisions of their contract. Mr. H. Miller, jun., assistant to Mr. Bruff, superintended the progress of the whole work, and supplied all necessary lines, levels, &c. The contractors estimate that in the course of the works 130,000 cubic yards, or 200,000 tons, of earth, have been excavated. Over 6,000,000 of bricks were used, and of these 2,000,000 were made by the contractors at the outfall works from a vein of brick earth which was excavated there during the execution of the works, and which proved a most useful find to the contractors, who turned out 30,000 bricks per day. The rest of the bricks were brought by water from Yorkshire, at a cost of over 10 per cent. above those of ordinary local bricks. Three thousand tons of cement were used, and this was supplied by Messrs. J. R. Pattrick & Son, of Dovercourt.

The Infectious Diseases Hospital.—This building, opened on the 18th ult., is situated on a large piece of ground recessed some distance from the Foxhall-road, a short distance past the Borough Asylum. It has been erected by Mr. Richard S. Smith, of Northgate-street Works, from the designs of Mr. E. Buckham, the Borough Surveyor, in consultation with the medical officer of health, Mr. G. S. Elliston, and under the immediate supervision of Mr. C. Cullingham and Mr. N. Catchpole, two members of the Health Committee. Although the main consideration has been to provide buildings adapted for the treatment of patients in the most approved manner, the buildings have some architectural pretensions. They are in a style which may be described as a modest kind of Domestic Gothic, and consist of four blocks,—a central block and three blocks to the east, west, and north, connected with the central block by covered ways, open at the sides,—the three outer blocks being thus completely isolated from each other and from the central block, which is devoted to the administrative department. The buildings are of red brick, with Portland stone dressings. The administrative department includes rooms for the porter in charge and for other purposes; there being two sitting-rooms, kitchen and scullery, with store-room, larder, and other closets, including a wardrobe for the keeping of patients' clothing during the time they are in hospital. On the first floor are four spacious bedrooms, so that if a resident medical officer became necessary during an epidemic, rooms could be provided for him, or for night nurses if it became necessary to have a relay of nurses. The three covered ways radiate from the central building to the outer blocks. The complete

isolation of each block makes it possible to treat three kinds of infectious disease in the hospital at the same period. In each block two wards,—male and female,—are provided, each containing four beds. The nurses' room is between the wards, having a window affording a view of each, a stove at which minor cooking operations might be conducted, and a store-room in immediate proximity. At the end of each ward a door opens to a passage, with doors at each end of it to the open air, and with earth-closet, sink, &c. The interiors of the wards have a very cheerful appearance. They are well-lighted from windows on each side, and the walls are lined throughout with white glazed bricks, relieved by buff, brown, and blue bands, the glazed surface of the walls, which is impermeable to moisture, rendering it specially easy to wash them, and remove all traces of infection. The floors are of pitch pine, and the exposed timbers of the roofs, which are ceiled at the plate level, are also of pitch pine, stained and varnished. Considerable care has been taken also with regard to ventilation. Two fireplaces with brick chimneys occupy the centre of each ward, the stoves being Elsey's patent; and, in addition to upright ventilating tubes at the corner of each room, there are ventilating-shafts in connexion with each stove. These, communicating with outer air under the floor, bring in the fresh air, which, being carried through the flues at the back of the stove, is warmed before being discharged into the room. Beneath each bed there will also be movable ventilators for use if required, to admit fresh air. Foul air is intended to find its way out by ventilators in each chimney, immediately below the ceiling, and by a ventilator in the ceiling leading through a pipe to an Archimedian screw ventilator. The size of the wards gives 2,000 cubic feet of air space to each patient, with a floor space of 144 ft. to each, the ample floor and air space thus provided obviating the necessity for a convalescent ward. There being four beds in each ward, and six wards, accommodation is provided for twenty-four patients in all. The contract for the erection of the building was 3,649*l.*, and the extras are not serious. The hospital has the advantage of being built upon a dry subsoil of sand and gravel, and the drainage is disposed of by a system of subsoil-irrigation. It is collected at certain fixed points, and thence distributed by a system of land tile drains, at a depth of about 1 ft. 3 in. or 1 ft. 6 in. The discharge is facilitated by the used of Field's automatic flushing tanks. Besides the main buildings described, there are two detached buildings at the corners of the grounds. One of these contains, in two parts, the mortuary, and a chamber for infected linen. The other building is the laundry and coach-house.

A SEASIDE REFLECTION.

AN article in the *Builder* of August 13th, referring to the sanitary condition of many health resorts, seemed full of interest when lately read at one of our southern watering-places, and, illustrated as it was by present facts, its moral and warning were more full of importance than they otherwise might have been. No need for names when conditions are so similar. To interested parties the disparagement of one town is only a foil to exalt and show up the superexcellence of some equally unsanitary resort.

One would hardly feel disposed, during the few days or weeks of the annual holiday, to set himself the thankless task of instructing lodging-house keepers and local authorities in sanitary improvements, so that it seems probable that only by a slow and painful process will our older and smaller watering-places learn the necessity of setting their houses in order. Until then, the newer towns, where at least some regard has been had to hygiene, and those older towns that have boldly dealt with the question, will command increasing patronage and prosperity.

Three questions concern the health-seeking visitor:—First, the public sewerage and water-supply; secondly, the house system of drains and water and general construction; thirdly, the cleanliness and habits of the householders who "let lodgings." When the first and second are assured by competent local authority, the third will be pretty easily resolved by simple inspection. Until then the laborious and painstaking efforts of the most conscientiously clean "landlady" will be an unfair struggle against unknown evils.

As in surgical art, ready methods of treating cases are had recourse to when the elaborate appliances of an hospital are not at hand, so in sanitary matters much may be done at little cost to render a house fairly healthy. Ventilate the soil-pipe at its highest point; have an exit for foul air as high up as possible in every w.c., and so arranged that it cannot be shut; keep the door of the w.c. shut; let there be no direct connexion between the cistern or sink, and drain. Some of these may seem trifling, but, in reality, all are important.

Until there are many reforms inside and outside the houses where hang the cards bearing the tempting word "Apartments," sea-breezes and ozone, change of air and scene, will often be mysteriously negatived,—especially in the case of those most needing these advantages,—by the unwholesome lodging-houses where of necessity so many hours, even during the longest and brightest days of a summer's holiday, are spent.

ON THE PRESSURE OF WIND UPON A FIXED PLANE SURFACE.*

THE recent failures of the Tay Bridge and other important structures during heavy gales of wind, have attracted much attention to the subject of this paper. The general solution of this problem may be thus briefly stated:—

Let v = the velocity of the current in feet per second.

h = the height through which a heavy body must fall to produce the velocity v.

w = the weight in pounds of a cubic foot of the impinging fluid [for atmospheric air averaging about 0·0765 lb.]

g = 32, the co-efficient of gravity.

Then $h = \frac{v^2}{2g}$; and since p the pressure of a fluid striking a plane perpendicularly and then escaping at right angles to its original path, is that due to twice the height h [Daubuisson's Hydraulics; Rouse's Experiments] we have simply

$$p = \frac{wv^2}{g}$$

$$= \text{(for atmospheric air)} \frac{0\,0765v^2}{32}$$

$$= \left(\frac{v}{20}\right)^2 \text{very nearly.}$$

From this easily-remembered formula the following Table of Pressure is constructed:—

Velocities in		Pressures in
Feet per second.	Miles per hour.	lb. per square foot.
10	6·8	0·25
20	13·6	1·00
30	20·4	2·25
40	27·2	4·00
50	34·0	6·25
60	40·8	9·00
70	47·6	12·25
80	54·4	16·00
90	61·2	20·25
100	68·0	25·00
110	74·8	30·25
120	81·6	36·00
130	88·4	42·25
140	95·2	49·00
150	102·0	56·25

In general, only these, the maximum pressures, are required; but sometimes, as in the case of the inclined sail of a windmill or ship, or the roof of a building, the diminished pressure upon the surface placed obliquely to the *effective* current is needed; we have then

$$p = \left(\frac{v \sin \theta}{20}\right)^2$$

in which v = the absolute velocity with which the air strikes the receding plane; and θ = the internal angle made by the obliquely-placed surface, and the direction of the impinging wind.

With regard to the phenomenon called "a gust of wind," nothing is known, either as to its cause, or as to its exceptional but almost momentary velocity, or as to the extent of the area over which it temporarily operates; but it is, notwithstanding, certain that a wind pressure of even 40 lb. on the square foot is unknown in these islands, because, as may be readily shown, this intensity of pressure would have sufficed to overthrow most of the long-existing factory chimneys, to overset post windmills, and to scatter the greater number of the slighter built domestic and other structures which have, nevertheless, "weathered many a storm," and still remain intact.

It remains to make a passing allusion to whirlwinds, tornados, and waterspouts, all the results of spiral motions apparently produced in some obscure manner by electrical action. These phenomena are very rarely observed to occur on an important scale in these kingdoms. The powerful forces concerned in or generated by these erratic movements have never been measured, and, consequently, cannot be formulated; but it may be observed that were they known they could not be introduced with propriety into calculations of the strength of structures intended to have a commercial value, because of the extreme improbability of any particular structure falling within the range of their destructive effects. They are, in fact, within the legal category of "Actus Dei."

The conclusion of the author of this paper, therefore, is that for structural calculations a maximum wind pressure of 40 lb. per square foot may be very safely adopted, notwithstanding some reported anemometrical observations to the contrary.

With regard to these observations the author remarks that the instruments in use are little better than philosophical toys, and that, in general, they afford no direct, comparable, or reliable indications of either velocities or pressures; and that they are often so injudiciously placed as in some instances to record the effects of combined, and, therefore, locally accelerated currents; whilst, in other instances, they record only the effects of obstructed, and, therefore, locally retarded currents.

As the acquisition of accurate data is of great and increasing importance, the author suggests that the British Association and other learned societies interested in physical investigations should unite in providing the necessary funds and observers for the purpose.

* Revised by the author, Mr. Thomas Hawksley, F.R.S. Read at York.

THE LIVERPOOL UNIVERSITY COLLEGE AND THE CORPORATION.

THE Liverpool Corporation have just decided to obtain Parliamentary powers for purchasing lands and buildings in Brownlow Hill, adjoining the old lunatic asylum, which has been purchased by the Council of the new University College, and to reconstruct the buildings thus proposed to be purchased, for the purposes of the college (subject to the use of the portion not built upon as a recreation-ground), the amount to be expended being 30,000*l.* In moving that the Council apply for the necessary powers, the chairman of the finance and estate committee of the Council observed that the great necessity of the present day was to improve the higher education of the people, and that to give higher scientific education to the youth of the community would greatly benefit the city at large. It was not a question to be limited to "value received," for he believed the city would receive value a thousandfold from the college; and when they bore in mind that private citizens had contributed their thousands, he thought that the least the municipality could do was to contribute to the cost of the college. Some opposition having been made to the proposal, the mayor, in warmly supporting it, said that the great fault of the present day with regard to education was that a most magnificent education was provided for the children of the poor, while for the class which provided the greater part of the enterprise of the country in our manufactories, shipbuilding yards, mines, and the iron industries, absolutely nothing had been done. But the Liverpool College would not be entirely for the middle class; it would be open for those of the poorer class who showed intelligence, and they would receive grants from the Council of Education which would take them up to University College. The proposal was unanimously adopted.

The City of London College.—The present building in Leadenhall-street is too small for the work carried on, and it is proposed to erect a new building in White-street, Moorfields, at a cost of 15,000*l.*, towards which there is a sum of 5,000*l.* in hand. The council ask for assistance to carry this out, especially from the Corporation and large employers of labour in the City.

THE LIVERPOOL BUILDING AND SANITARY ACTS.

AMONGST the Private Bill applications to be made in the next session of Parliament is one by the Liverpool Corporation for powers to amend the local building and sanitary Acts, and it is intended to hold a conference with the Architectural Society on the several amendments which it is proposed to make in the existing Acts. Amongst others the contemplated amendments include powers to have cases of infectious disease compulsorily registered; also that powers shall be given to the Council to buy insanitary property by agreement, if they can, instead of compulsorily. They also propose to have control over the great network of telegraph wires over the town. During the discussion which took place when the proposed Bill was before the Council, Sir James A. Picton strongly supported its advisability, observing that its provisions were urgently needed in the interests of the city's welfare.

THE NEW EDDYSTONE LIGHTHOUSE.

THE lantern has been added to the new tower. The old lighthouse by its side looks singularly puny in contrast. All the exterior fittings are of gun-metal. The tower itself, as our readers are aware, is entirely of West country grey granite, save a few courses at the base, which are of Aberdeen. The lantern is the largest in the world. The fog-bells weigh each over two tons (4,486 lb. and 4,627 lb. respectively). They stand 4 ft. 6 in. high, and are 5 ft. 1½ in. diameter at the mouth. They are fixed 130 ft. above high-water mark. Messrs. Chance, of Birmingham, have put up the lantern. The bell-shaped cap above is 150 ft. above high-water mark. Plymouth may now boast of by far the finest light-house tower in the world. A very excellent photograph of it was taken last week by Mr. George Long, photographer, Union-street, Plymouth. The work is expected to be complete by the time of the proposed visit of the Associated Chambers of Commerce, which is fixed for October 6th.

DEVELOPMENT OF WATER POWER IN THE UNITED STATES.

AT the thirteenth annual convention of the American Society of Civil Engineers, held at Montreal lately, Mr. James Bicheno Francis, president, delivered an address, in the course of which he said:—Water-power in many of the States is abundant, and contributes largely to their prosperity. Its proper development calls for the services of the civil engineer, and as it is the branch of the profession with which I am most familiar, I propose to offer a few remarks on the subject. The earliest applications were to grist and saw mills; carding and fulling mills soon followed; these were essential to the comfort of the early settlers, who relied on home industries for shelter, food, and clothing, but with the progress of the country came other requirements. The earliest application of water-power to general manufacturing purposes appears to have been at Paterson, New Jersey, where "The Society for Establishing Useful Manufactures" was formed in the year 1791. The Passaic River at this point furnishes, when at a minimum, about eleven hundred horse-power, continuously night and day.

The water-power at Lowell, Massachusetts, was begun to be improved for general manufacturing purposes in 1822. The Merrimack River at this point has a fall of 35 ft., and furnishes, at a minimum, about ten thousand horse-power during the usual working-hours.

At Cohoes, in the State of New York, the Mohawk River has a fall of about 105 ft., which was brought into use, systematically, very soon after that at Lowell, and could furnish about fourteen thousand horse-power during the usual working hours, but the works are so arranged that part of the power is not available at present.

At Manchester, New Hampshire, the present works were commenced in 1835. The Merrimack River at this point has a fall of about 52 ft., and furnishes, at a minimum, about ten thousand horse-power, during the usual working-hours.

At Lawrence, Massachusetts, the Essex Company built a dam across the Merrimack River, commencing in 1845, and making a fall of about 28 ft., and a minimum power, during the usual working-hours, of about ten thousand horse-power.

At Holyoke, Massachusetts, the Hadley Falls Company commenced their works about 1845, for developing the power of the Connecticut River at that point, where there is a fall of about 50 ft., and at a minimum, about seventeen thousand horse-power during the usual working hours.

At Lewiston, Maine, the fall in the Androscoggin River is about 50 ft.; its systematic development was commenced about 1845, and with the improvement of the large natural reservoirs at the head waters of the river, now in progress, it is expected that a minimum power, during the usual working-hours, of about eleven thousand horse-power will be obtained.

At Birmingham, Connecticut, the Ousatonic Water Company have developed the water-power of the Housatonic River by a dam giving 22 ft. fall, furnishing, at a minimum, about two thousand horse-power, during the usual working hours.

The Dundee Water and Land Company, about 1858, developed the power of the Passaic River, at Passaic, New Jersey, where there is a fall of about 22 ft., giving a minimum power, during the usual working-hours, of about nine hundred horse-power.

The Turner's Falls Company, in 1866, commenced the development of the power of the Connecticut River at Turner's Falls, Massachusetts, by building a dam on the Middle Fall, which is about 35 ft., and furnishes a minimum power, during the usual working-hours, of about ten thousand horse-power.

I have named the above water-powers as being developed in a systematic manner from their inception, and of which I have been able to obtain some data. In the usual process of developing a large water-power, a company is formed who acquire the title to the property, embracing the land necessary for the site of the town to accommodate the population which is sure to gather around an improved water-power. The dam and canals or races are constructed, and mill sites with accompanying rights to the use of the water are granted, usually by perpetual leases, subject to annual rents. This method of developing water-power is distinctly an American idea, and the only instance where it has been attempted abroad, that I know of, is at Bellegarde, in France, where there is a fall in the Rhone of about 33 ft. Within the last few years works have been constructed for its development, furnishing a large amount of power, but from the great outlay incurred in acquiring the titles to the property, and other difficulties, it has not been a financial success. The water-powers I have named are but a small fraction of the whole amount existing in the United States and the adjoining Dominion of Canada. There is Niagara, with its two or three millions of horse-power; the St. Lawrence, with its succession of falls from Lake Ontario to Montreal; the Falls of St. Anthony, at Minneapolis, and many other falls, with large volumes of water, on the upper Mississippi and its branches. It would be a long story to name even the large water-powers, and the smaller ones are almost innumerable. In the State of Maine a survey of the water-power has recently been made, the result, as stated in the official report, being "between one and two millions of horse-power," part of which will probably not be available. There is an elevated region in the northern part of the South Atlantic States exceeding in area one hundred thousand square miles, in which there is a vast amount of water-power, and being near the cotton fields, with a fine climate, free from malaria, its only needs are railways, capital, and population to become a great manufacturing section. The design and construction of the works for developing a large water-power, together with the necessary arrangements for utilising it, and providing for its subdivision among the parties entitled to it, according to their respective rights, affords an extensive field for civil engineers, and, in view of the vast amount of it yet undeveloped, but which with the increase of population and the constantly increasing demand for mechanical power, as a substitute for hand labour, must come into use, the field must continue to enlarge for a long time to come. There are many cases in which the power of a waterfall can be made available by means of compressed air, more conveniently than by the ordinary motors. The fall may be too small to be utilised by the ordinary motors; the site where the power is wanted may be too distant from the waterfall, or it may be desired to distribute the power in small amounts at distant points. A method o compressing air by means of a fall of water has been devised by Mr. Joseph P. Frizell, C.E., of St. Paul, Minnesota, which, from the extreme simplicity of the apparatus, promises to find useful applications.* The principle on which it operates is by carrying the air in small bubbles in a current of water down a vertical shaft to the depth giving the desired compression, then through a horizontal passage, in which the bubbles rise into a reservoir near the top of this passage, the water passing on and rising in another vertical or inclined passage at the top of which it is discharged, of course at a lower level than it entered the first shaft. The formation at waterfalls is usually rock, which would enable the passages and the reservoir for collecting the compressed air to be formed by simple excavations with no other apparatus than that required to charge the descending column of water with the bubbles of air, which can be done by throwing the water into violent commotion at its entrance, and a pipe and a valve for the delivery of the air from the reservoir. The transfer of power by electricity is one of the problems now engaging the attention of electricians, and it is now done in Europe in a small way. Sir William Thomson stated in evidence before an English Parliamentary committee, two years ago, that he looked "forward to the Falls of Niagara being extensively used for the production of light and mechanical power over a large area of North America," and that a copper wire half an inch in diameter would transmit twenty-one thousand horse-power from Niagara to Montreal, Boston, New York, or Philadelphia. His statements appear to have been based on theoretical considerations, but there is no longer any doubt as to the possibility of transferring power in this manner; its practicability for industrial purposes must be determined by trial. Dr. Paget Higgs, a distinguished English electrician, is now experimenting on it in the city of New York.

CONSTRUCTION OF PUBLIC LIBRARIES.

AT the final meeting of the Library Association, held last week in the Hall of Gray's Inn, Mr. William Archer, librarian of the National Library of Ireland, read a paper entitled "Suggestions as to Public Library Buildings: their Internal Plan and Construction, &c.," in view of the intended transference of the books constituting the National Library of Ireland to another building. Briefly, the requirements were stated as "compact stowage to save space, combined with short distances to save time." There should be a good-sized, lofty and commodious, well-heated, well-lighted, well-ventilated, comfortably-fitted, and tasteful reading-room for the general public, and side by side two or three minor rooms for more exclusive study, one of which should be devoted to lady readers. It was desirable also to have a small room for conversation. In these rooms no book should be kept except books of reference, which the public might take from the shelves. The books should be brought from the stores by attendants, and the rooms might be classified, being devoted to different classes of readers, such as the readers of light fiction and those reading more recondite subjects. The stores of books, or library proper, should be in the apartments adjoining, and, as much as possible, grouped around the reading-rooms. They should be approached without necessarily intruding upon or passing through the reading-room. The reader of the paper dwelt at length on the nature of the internal fittings of the store-rooms, and recommended that the reading-room should be on the first story of the building, so that the ground-floor and the second floor might be available for storage. Obviously a library building ought to be isolated, and it should, as far as possible, be fireproof. To aid in the latter purpose the bookcases and tables might be made of iron, covered with leather to obviate injury to the books. The structure of the building should be so planned as to admit of future extension of storage room. Such an arrangement as he had suggested would meet the requirements of a library for a much longer period than the methods now in vogue. What was wanted was despatch in bringing the books required from the shelves and placing them at once before the readers; and the advantages of this plan he thought would be obvious. Distance and effort

* Journal of the Franklin Institute for September, 1877.

would be reduced to a minimum, and time would be manifestly saved. The paper concluded by a reference to a plan for library buildings suggested by Mr. W. F. Poole, librarian of the City Public Library, Chicago, and some points of difference were noticed. Mr. Archer stated that the general ideas and leading principles of his plan, as submitted to the council of trustees of the National Library, had been approved, and he expressed a hope that they might be embodied in the plans which the architect might be called upon to make.

ELECTRICITY AS A MOTIVE POWER.

AT the Electrical Exhibition in Paris, various machines show the application of machinery as a motive power. For example, there is a circular saw driven by electricity. The diameter of the saw is 3 ft., and the planks upon which it works are 5 in. thick. M. Piat exhibits in the same part of the building a stone cutter and an electrical hammer, which does all the work usually assigned to a steam hammer. Close to these machines is another for pumping water, driven by a Gramme motor; the large volume of water which is thrown out conveys to the eye some idea of the great force which can be transmitted by electricity, although, in reality, this machine does not require nearly so much force as many other motors in the exhibition. In the same corner we find a number of machines for driving band-saws, and so forth, all driven by the convenient little motor of M. Deprez. Near to this spot there is also a rock-drilling machine. The drill rotates under the influence of a Gramme machine, and while a hole is being bored it advances under the influence of the water pressure obtainable in Paris, which is about three atmospheres.

RAILWAY COTTAGE BUILDING.

AT the recent half-yearly meeting of the North Eastern Railway Company, the chairman made some interesting observations in reference to the building of cottages for the servants in the company's employ, from which it appears that this particular class of dwellings have been erected on an extensive scale by the North Eastern directors. He said that at different times the company had taken power to build cottages for the accommodation of those in their employ; and they had now no fewer than 2,324 cottages, each of which had its own garden attached. The rent paid was a fair interest on the money laid out, and the cottages were built in places where the servants of the company could not otherwise obtain house accommodation. The company had in this way laid out nearly half a million. In addition to the cottages with gardens he had mentioned, there were 1,000 more cottages which had no garden attached to the house, but in the great majority of cases they had patches of land, sometimes on the side of the line, and sometimes at a little distance. The company had in this respect been making what he regarded as a very wise and judicious investment for themselves, besides adding materially to the comfort of their servants.

MACHINE-MADE LACE.

IN the first Cantor Lecture on the art of lace-making, now in course of publication, Mr. Alan S. Cole says:—Our English pillow-lace workers adopted some of the Brussels patterns and some of the Mechlin; but English taste was easily gratified by less skilfully arranged patterns, and found sufficient pleasure in the peasant laces of Buckinghamshire and Devonshire. It is these patterns that a good deal of the machine-made lace imitates, though within the last three or four years there has been a marked phase of other more ambitious imitation in the machine-lace trade. Something akin to the rich patterns of ancient hand-made lace is new made by the machine, and to the majority this substitution of machine-made for hand-made goods is satisfactory. As a rule, the difference between machine and hand made lace is not detected by the many. If there is a difference, to some it is that machine-made lace, from some points of view, is the more wonderful and more to be prized of the two sorts of work. Setting aside any prejudices one may have, and reviewing the variety of forms wrought years ago, we may consider some of the circumstances of the production of laces. Sometimes laces were made in dim and dark cellars, so that the soft fragile threads should retain their elasticity, and not become brittle. A ray of light alone was allowed to fall upon the workwoman's cushion. What an expense of eyesight and health must then have taken place! Compare truly costly works produced in such circumstances, with the low-priced repetitions done in taut wiry cotton threads which grow with precise monotony of pattern in the bustle and clatter of machinery, at the expense of iron and steam, and one is perhaps inclined to be glad at the release of human labour from penalties like those which formerly accompanied lace-making. I do not think any one can well say what may succeed to the mechanically devised and produced materials now called lace. They seem to satisfy present demand and to reflect the taste and ability of the age. Is it vain to hope for a revival of hand-made works? Is the time to arrive when machinery shall have exhausted itself in its endeavours to infuse into its productions the quality of handwork, or has a period commenced when people shall be contented with mechanical instead of manual art, and so from this, possibly, pass on to a condition of indifference to fine artistic works of handicraft, which not many years since were reported to have been pronounced by a philosopher and leader of opinion to be but the rubbish of human labour?

PATENT RECORD.*

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending Sept. 3, 1881.

5,509. J. H. Corke, Southsea. Material for making chimneypieces, &c.

This is composed of 6 lb. of sulphate of iron, 4 lb. sulphate of aluminia, and 3½ lb. logwood, placed in 18 gallons of water, and boiled for two hours. The mixture is then strained and cooled. It is then run into moulds, and thoroughly dried by heat, when it is ready for use. Dec. 31, 1880. Price 2d.

247. F. Winterhoff and H. C. Webb, Worcester. Ornamental enamelling of iron, glass, &c.

The surface to be ornamented has a coating of enamel. The outline of the design is drawn on a stone, and an impression taken on transfer paper. The outline on paper is then transferred by pressure on the enamelled surface, and is burned into it. Colour is produced by printing on the paper in adhesive enamel colour, and transferring it to the surface. The pressure is effected by a pair of rollers, the lower one of wood, the upper of india-rubber. Jan. 20, 1881. Price 6d.

313. H. Skerrett, Sparkbrook. Apparatus for opening, closing, and fastening certain kinds of windows and skylights.

This is applicable to those windows, &c., that are hung or centered on pivots. A quadrant bar is fixed to the top of the window frame, and on the upper part of the sash is a plate, through which the quadrant bar passes. On the top of this plate is a cranked lever, the short arm of which takes into notches on the upper edge of the quadrant. A spring is fixed on the long arm to keep the short arm in these notches. A cord is fastened to the long arm to lift the short arm out of the notches, and to open the window. The other end of the cord passes over a pulley, and is fastened to the sash to close it again. Jan. 24, 1881. Price 8d.

351. R. Jackson, Leeds. Warming and heating buildings, tanks, vehicles, &c.

A lamp is enclosed in a pipe with a bell-shaped mouth, which pipe is continued in coils to heat the building, &c. (*Pro. Pro.*) Jan. 26, 1881. Price 2d.

387. J. Britton, Stamford. Firegrates or containers.

The object of this is to obtain "slow combustion" in common grates and stoves. A form is made of fireclay to fit the grate with bottom, back, and two sides. This is placed in the grate. Jan. 28, 1881. Price 6d.

392. T. J. Sloan, St. Maude, France. Apparatus for thawing ice in water supply-pipes, &c.

A portable boiler is used, the steam in which forces the hot water up in a flexible tube, which is inserted in the pipe to be thawed and forced into the same by springs. (*Pro. Pro.*) Jan. 28, 1881. Price 2d.

403. T. Bate, Kilburn. Ventilating pots or cowls for soil-pipes.

The cowl is the ordinary cone chimney-cowl, but at the top of the cone is an outlet, from which rises a cylinder of wire gauze, above which is a cap. The wire gauze prevents any down-draught. Jan. 29, 1881. Price 4d.

406. J. Hopkinson, Manchester. Apparatus to prevent the formation of ice in water supply-pipes.

A copper ball or chamber is connected with the main supply pipe, as near its entrance into the building as possible. This is inclosed in a cover or hood of fireclay, with a hole in the top, which rests on a perforated plate. Through this passes the gas-burner, and when this is lighted the water in the ball is heated and rises in the supply-pipe. Jan. 29, 1881. Price 6d.

410. L. J. Newman, Inchbrook. Cistern valve.

A tubular valve is used, from the upper end of which passes a tube which reaches to the water level, and which therefore serves as an overflow pipe and as an air-pipe to the valve. (*Pro. Pro.*) Jan. 31, 1881. Price 2d.

Published during the Week ending Sept. 10, 1881.

380. W. Leggott, Bradford. Closing and fastening doors.

In the bottom of the hanging style of the door is the centre of a toothed pinion, which works into a rack placed in guides. At the end of the rack is a screwed spindle, round which is coiled a spring. When the door is opened the pinion actuates the rack and puts the spring in tension, which shuts the door again, when it is liberated. A bolt is arranged to lock the rack and fasten the door. Jan. 28, 1881. Price 6d.

439. E. J. Hill, Westminster. Means of hanging or supporting window-sashes and blinds, &c.

A rod is fixed vertically to the frame. A piece of metal, with a hole in one extremity to work over the rod, is placed loosely in a frame, which is fixed to the sash. This piece of metal works on a fixed fulcrum, and while the hole is in line with the rod, the sash will move freely, but when it is turned the eye grips the rod and prevents the sash moving. (*Pro. Pro.*) Feb. 2, 1881. Price 2d.

523. J. Westley, Birmingham. Fire-places.

The back is formed of fire-clay, &c., with a nearly horizontal projecting part above the fuel to radiate the heat into the room. (*Pro. Pro.*) Feb. 7, 1881. Price 2d.

536. R. H. Gudgeon, Winchester. Chimney-piece coverings or castings.

The jambs and friezes of the chimney-piece coverings are made in separate parts, and so fixed that they can slide one on the other as required. They can, therefore, easily be adapted to any different size or form of chimney-piece. Feb. 8, 1881. Price 6d.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

CHURCH DECORATION.

New Mills (Derbyshire).—St. James's Church, erected a very few years since at the cost of Mr. and Mrs. John Mackie, of New Mills and Wakefield, as a memorial to the lady's parents, has been re-opened for service after receiving interior art decoration. This is subordinated to the architectural features of the building, which it emphasises. The more novel detail is the introduction within four pointed arch wall-recesses in the nave of as many groups of spirit-fresco painted figures, embracing the subjects of Christ blessing Little Children, the Sermon on the Mount, Feeding the Five Thousand, and the Final Commission to the Apostles, with suitable text legends beneath. These groups compose pyramidally, and are in dark outline, relieved by a dull Indian red background, with here and there a little gold. In the ornamented bases are emblems of the four Evangelists. The artists of the frescoes and decorations are Messrs. Powell, Brothers, of Leeds,—Mr. W. Swinden Barber, of Halifax, being the supervising architect.

LONDON FRONT GARDENS.

PASSING through the familiar districts of South Kensington and Earls Court the other day, among many large and many well-built houses, one general drawback was very evident. It was the want of front gardens, which, in a neighbourhood comparatively suburban, is a great fault. We are perfectly aware that the high value of land around London makes it difficult to devote even a small portion as a garden to each house, but in many cases it is quite practicable to do so; that is, just sufficient to operate as a screen and as a pleasant and refreshing relief to the buildings.

In going up one road and down another, among tall houses without any vegetation visible, it is wearisome to the eye to see nothing but bricks, mortar, and dust,—dust, mortar, and bricks, whichever way we turn. It reminds us of the agreeable nickname of "The Catacombs," bestowed by Thackeray on the Harley-street region. There is now, of course, no remedy for streets which are already built over, but in future we wish to invite the attention of owners, architects, and builders to the vast improvement which is given to the appearance of a street by having a limited patch of green before each house. Much ground could not be afforded, and again, ladies, as a rule, do not like long front gardens in which during rain a bonnet may be spoiled while passing from the carriage or cab to the door. But a slip, even two or three yards wide, irrespective of the area, would hold some evergreens or a small tree, and give the agreeable relief which we advocate. As an instance in question, we may point out the district of Campden-hill, where the houses are set back a total distance, including areas, of from 10 ft. to 15 ft., the front space planted with evergreens; this is a pleasant and successful part, including Phillimore-gardens, Essex and Durham villas, Stafford-terrace, &c. Leinster-gardens,

Bayswater, is another instance. Parts of Cromwell-road, Queen's-gate, Harrington-gardens, and other streets farther out, are examples, on the contrary, of the dry and unrelieved style.

H. & R. POWELL.

LINCOLN'S INN CHAPEL.

THE Chapel of Lincoln's Inn is a work by Inigo Jones,—a dated work, too, for it was consecrated on Ascension Day, 1623,—and is an example of the latest phase of Gothic architecture. Without asserting that the old is in no case to give place to the new, we may surely, in this case, seriously ask under whose advice, and for what justifying purpose, have parts of this interesting building been demolished, and whether or not more is to follow? The well-known groined staircase has been knocked down, and the "pieces" are deposited in the groined open way beneath the chapel, where lawyers were wont to walk "and confer their learnings." One of the masons engaged in the work was somewhat indignant when we termed this "destruction," and asserted that all the pieces were numbered, and that he intended to make a drawing so that the staircase might be put back again twenty years hence if desired! We endeavoured to learn who was the architect who took the responsibility of this regrettable act, but failed,—none of the workmen about knew anything of him. It is sincerely to be hoped, this matter having already been publicly commented on, that proper pressure has been brought to bear on the Benchers.

VERGERS AND CATHEDRALS.

SIR,—I have the pleasure to inform "C. T. H." that at the meeting of the British Association the members were saved the infliction of the verger. Those who visited the Minster did so under the guidance of the Dean or one of the Canons. I was one of a large party conducted by the Dean. He was instructive and cheerful, without being vulgar, and he did not offer to lay a wager with any of us upon the extent of our ignorance.

The suggestions contained in the last paragraph of the letter of "C. T. H." are admirable, and will, I hope, be carried out.

The remarks of Mr. Smirke do not touch the point at issue at all. He could not have gone over the cathedral with the mob at 6d. a head, or he would not have been allowed to spend an hour in the crypt making notes for his pattern-book. He must have had a special privilege granted to him, which, doubtless, entailed "a complex and delicate" tip to "the model of politeness and intelligence." Grammatical exactitude and propriety of expression are, perhaps, not necessary for intelligence; or there may be a superior verger kept for architects and private visitors. Should this not be the case, and Mr. Smirke intends publishing his notes of the information acquired from the verger, I hope he will submit them beforehand to some friend familiar with the acquirements of grammatical propriety, so that the solecisms may be corrected. Being allowed to see the cathedral under exceptional circumstances, how can he venture to give an opinion of what is said to "the large number of persons of different capacities" by the verger whose vulgar nonsense I quoted?

Mr. Smirke, excusing the vergers of England by what is done at St. Denis, convinces me that he must have been at the same school with that eccentric logician who made so strange a reply when he was told how dirty his hands were.

F. S. A.

SIR,—There is, at least, one cathedral in England where one may revel amidst glorious chapels, and amongst wondrously beautiful detail, without having a verger at one's coat-tails, and that is at Exeter. The duly appointed officials are always in attendance, but the merest hint that one prefers to stroll quietly about by one's self is at once sufficient for Messrs. Parsons and Thomas, the vergers in question, who are always perfectly content to leave the visitor to follow his own courses until the next service hour. The only restriction put upon the public, and that a most vexatious one, is that no permission can be given to sketch without going through a formula which might possibly take several days to comply with. What with getting the Dean's permission, to allow the Canon in residence, to instruct the Cathedral surveyor, to direct the clerk of works, to give the vergers orders, to permit you to draw and the running about from pillar to post that all this involves, the short hours during which the sacred fane is available to the public so soon slip away that, as a rule, people find the procuring of the necessary permit very much more bother than it is worth.

Yet, be it remembered, Exeter Cathedral boasts of two of the finest Norman towers in England (built 1107—1206). The most perfect and beautiful Early English oak carvings in this country are Bishop Bruere's (1224–44) half-hundred choir-seats; and certainly the loveliest wood-carvings belonging to the Decorated period are to be found upon Bishop Stapeldon's exquisite throne, which is itself by far the largest and most magnificent bishop's throne in the entire world. Again, the sedilia, made in the same bishop's time, and wrought entirely of stone from the neighbouring quarry of Beer, is probably one of the lightest and most delicately-exquisite specimens of Decorated masonry in existence. Further, the most imposing and majestic feature in the whole building is the unbroken run of Exeter Cathedral's roof groining. It is nearly 400 ft. long, and gives a continuous succession of gracefully-vaulted lines, which are not exceeded in beauty by any roof I ever saw in my life,—"There is a skeleton in every house," the old saw says; and the one that exists at Exeter is the unnecessary difficulties placed in the way of drawing. Between service hours every visitor should have a perfect right to make such notes and sketches as suggest themselves. Englishmen are apt to kick against asking the permission of that old fogey and of this, to do that which the natural instinct of every properly-reasoning man tells him he has an absolute right to do.

HARRY HEMS.

SIR,—On more carefully reading the letters on the above, I find I was mistaken as to the character of the complaints from "F.S.A." and others. I thought myself justified in making the remarks I did, as, after a long absence, I have spent much time in visiting our cathedrals. Of course, I quite agree with your correspondents that vergers are "bores," and that their company is unfairly forced upon visitors. They should, in fact, only act as policemen and custodians of the noble buildings to which they are attached. If, by your powerful influence, you can bring about such a happy state of things, and make a visit to our sacred buildings less like "doing" the State Apartments at Windsor or the Tower of London, you will, I am sure, earn the lasting thankfulness of all.

SYDNEY SMIRKE.

THE CHURCHES AND TOWNS OF BUCKINGHAMSHIRE.

SIR,—Permit me to correct an error under which, as I think, the writer of the article on "Maids Morton Church," in your last issue, evidently labours. He says:—

"Buckinghamshire is by no means a rich county for the ecclesiologist, and it is somewhat singular that in such a purely agricultural district the towns should be so remarkably uninteresting, and the churches should have fared so badly. Yet, somehow or other, the important towns in Buckinghamshire seem to have been deprived of their ancient churches about a century or so back, and for what reason it is impossible to say."

And not content with running down our churches, he proceeds to speak very disparagingly of our towns. Now, in both these respects he is wrong. Does he know Newport Pagnell? Here is a town, although with a population some hundreds less than 4,000, yet with a church which, for size, beauty (both of external situation and internal arrangements), and attendance is not to be surpassed in this or any other county; and a town which, for its High-street, and the shops in it, excels many in other counties with double and treble its population. And the same might be said of many other towns and churches in Buckinghamshire.

I trust to your sense of justice to insert these few lines with a view of counteracting an erroneous impression which may have been produced respecting our county by the article in your last issue already referred to.

JOSEPH SIMPSON.

P.S.—Newport Pagnell Church (both external and internal) and the High-street, would make excellent illustrations for the pages of the *Builder*.

Glass-covered Iron-ware.—Is this manufacture still carried on? More than one correspondent asks us the question.

FIRE AND WATER.

SIR,—I, like many others, seek your aid when in distress, and will thank you to insert my remarks in your next issue on the subject to which they apply, namely, that of the defective provision for extinguishing fires in the metropolis. This subject you have handled over and over again, and I fear I cannot use terms sufficiently strong to induce you to place them before the public. Let the subject speak for itself, and direct your decision, viz., the security of lives and property, and the reduction of destruction thereof; and wherein myself and many readers of your journal see no difficulty. I remember some few years ago reading a proposition made by a gentleman of some standing in the metropolis, and evidently with some knowledge of the subject, being before the Common Council or the Metropolitan Board, a scheme for providing elevated reservoirs in certain parts of the City, whereby mains, and thus hydrants, would be constantly supplied or charged; so that at the outbreak of a fire a policeman on that beat could connect hose, which would be enclosed in the nearest recess available, same as now done in the Pavilion at Brighton, and elsewhere, and be able to connect to the nearest hydrant and turn on without waiting for fire-engine or any other aid. That proposal was not accepted, and thus the heart of London is left unprotected. I, as a practical man, consider that was a scheme, if I may use the term, which would, had it been carried out, have saved many lives and much property. The late fire in the City exemplifies the necessity of some such ready application, and until such provision be made lives and property will be at stake.

It is a disgrace to the metropolis, or to the managers or mismanagers, that London should be last in the race of water supply for the inhabitants and provision for extinguishing fires. The talent that can be brought to bear on this important question is within call. Many engineers, and thoroughly practical, would soon devise the machinery and arrangements, and give a guarantee for its efficiency to accomplish this end. The pecuniary matter should be a secondary consideration. Taking all in all, and our noble Prince lending his presence and assistance to attain the desired end, I do consider it reflects strongly on those in office and power, when all interested can look around in the provinces and see the wise provision made for the security and prosperity of its inhabitants.

Pray, Mr. Editor, do all you can to bring this important subject forward. Urge on, as you have already done, the necessity, and show forth the grave and responsible position of those who are in power, and neglect to bring about the remedy so easily attainable.

T. S.

OWNERSHIP OF BILLS OF QUANTITIES

SIR,—Will one of your numerous readers, who is an architect or quantity surveyor, kindly inform me (in the following case) as to the ownership of a priced and moneyed-out set of lithographed bills of quantities upon which a builder had *successfully* tendered? Do they belong to the builder or the architect, who had taken off his own quantities? The builder, although successful, had to submit to a revised estimate being prepared by the architect, the whole of the works coming to too much money, and these quantities were borrowed to form the basis of the valuation of the revised estimate. I was then called upon to represent the builder, and the revised estimate not being to my satisfaction, I withdrew the builder's original tender. The architect then claimed and refused to give up the lithographed priced and moneyed-out bills of quantities, upon the ground that they had not been paid for, and, consequently, were his property. Certainly the charges for lithography had not been paid, neither had the charges for taking off the quantities; nevertheless, under these circumstances, did these bills of quantities belong to the architect or the contractor?

WILLIAM H. PIPE.

SCHOOL-BOARD SCHOOLS.

Peckham.—The new Board-school in Wood's-road, Peckham, has been opened by the School Board for London. The school, which is the 239th new building opened by the Board, and the 60th in the Lambeth division, is built to accommodate 1,400 children. The cost of the building has been 8*l.* 16*s.* 6*d.* per child, and the cost of the site has been somewhat under 6*l.* per child. The school has been erected from the designs of Mr. E. R. Robson, the architect to the Board.

Salford.—On the 17th inst., Mr. Joseph Rice, the vice-chairman of the Salford School Board, laid the memorial stone of the Trafford-road Board-school, now being erected in the Ordsal ward to provide accommodation for 600 children. The school is situate at the corner of West Worsley-street and Robert Hall-street. The main building in Robert Hall-street is two stories high. On the ground-floor is to be the girls' department, which will have a schoolroom 50 ft. by 32 ft., and two class-rooms, 17 ft. by 16 ft. The entrance will be in London-street, and adjoining the entrance a cloak-room will be provided. The boys' department, on the upper floor, will have similar accommodation to the girls', and be entered from West Worsley-street by a well-lighted staircase. The infants' department is to be at the rear of the main building, and only one story high; it will include a main schoolroom and a large class-room for the junior infants. Large playgrounds are to be provided, of which a considerable portion will be covered. The buildings will be in the Gothic style. The fronts are being faced with selected brick. The string-courses and other dressings are generally in red terra-cotta. The contract for the whole of the work, amounting to 4,750*l.*, is being carried out by Mr. J. L.

Ward, builder, Manchester, from the designs and under the superintendence of Mr. Henry Lord, architect, Manchester.

Miscellanea.

Middle-Class Education.—A new middle-class school for 200 girls was opened last week in Chenies-street, Tottenham-court-road, the whole cost of which, amounting to several thousands of pounds, has been defrayed by a lady of the Goldsmid family. The school site happens to be on the edge of the Bedford Estate, adjoining the land which, centuries ago, was bequeathed for educational purposes by John Carpenter to the City of London, and which gave rise to the present City of London School. The new school and its playground occupy a corner site, about 70 ft. square, of which about one-half is built upon, the remainder being an open playground. The building is, inclusive of the basement, five stories high. The teaching department is entirely on the ground and first floors, and consists of five class-rooms, each holding forty children. As it is occasionally desirable to have a room or hall large enough to accommodate all the pupils, for lectures, examinations, prize distributions, or similar occasions, and the site is insufficient for the construction of a separate room for such purposes, three adjoining class-rooms on the first-floor have been so constructed with movable partitions that they can be thrown together, thus forming a single compartment, about 66 ft. by 22 ft. By these shifting partitions the entire clear length and width of the three class-rooms are obtained for the formation of the hall, without the obstruction usually caused by movable partitions. Each separating partition consists of three widths, the two side-widths being large doors, folding back against the walls, the central width being a thick sound-proof revolving wood shutter, sliding up and down in grooves on the edges of the closed doors. On the first-floor there are three sound-proof music practising-rooms, with double doors; and on the basement, level with the playground, are luncheon-rooms for pupils and teachers, cloak-room, lavatories, &c., and kitchen and living-rooms for the caretaker. The second floor is devoted to the head-mistress; and the third floor, in the roof, forms a large winter or wet-day playground, which will be fitted with suitable gymnastic apparatus. The exterior of the building, which is faced with red bricks and red Mansfield stone dressings, is an adaptation of the Early French Renaissance style, the high-pitched slated roof containing the second and third floor stories. The architects are Messrs. Davis & Emanuel.

Scroll Ornamentation.—At a recent meeting of the Royal Historical and Archæological Institute of Ireland, Mr. Marcus Ward exhibited a rubbing and coloured tracing of Hiberno-Romanesque scroll ornamentation from the old church of Maghera, county Londonderry, and contrasted therewith the engraving of the same scroll work given by Lord Dunraven in his work on "Irish Ecclesiastical Remains," showing the inaccuracy of the latter. He drew the attention of the meeting to the wealth of artistic design which the work displayed, exemplifying the varied fancy of the early artists of Ireland. Mr. Wakeman objected to the idea that the famous Opus Hibernacum, for which Ireland was celebrated during the Middle Ages, was derived from foreign sources, and he pointed out that on the oldest megalithic monuments of Ireland, the elements of all classes of ornamentation, such as are found in the earliest manuscripts of the country, and even upon churches of a comparatively late period, can be traced.

The Fish Market Accommodation in London.—This subject is now, as readers of the daily papers know, occupying the attention of the Special Committee of the Corporation of the City of London, and instructions have been given that any suggestion as to a site for such market forwarded to the City Architect, Guildhall, on or before the 28th instant, will be considered.

An Exhibition of Domestic and Sanitary Appliances was opened at Wolverhampton on Monday last. Gas and other stoves are largely represented, Messrs. Barnard, Bishop, & Barnard, and other well-known firms, being exhibitors.

The Brighton Exhibition.—The eighth annual exhibition of modern pictures in the Pavilion at Brighton is now open. The private view took place on Wednesday, the 21st.

"Not an Arch; Something in Architecture."—Mr. F. T. Dollman, in his recent work on the Church of St. Mary Overie, Southwark (now commonly known as St. Saviour's), refers, if we mistake not, to the unseemly contests that have occurred from time to time in connexion with the election of "Chaplain," as the holder of the living is officially styled. The election is by vote of the inhabitant ratepayers, and the polling has been carried on amidst scenes of turbulence only capable of being summed up in the one word, "rowdyism." Even as Mr. Dollman's work was passing from the press, the parish witnessed another such contest, the proceedings connected with which led to an offer being made by the bishop of the diocese (Rochester) to raise or provide funds for the endowment of the chaplaincy and the maintenance of the fabric, on condition that the presentation to the living should vest in the diocesan. A meeting of the parishioners to consider the offer was held on the 12th inst., Mr. Thomas F. Rider, "Warden of the Great Account," in the chair. A minority of those present at the meeting, for reasons known to themselves, opposed the motion which was made for referring the Bishop's offer to a representative committee, which was, however, ultimately carried. In the course of the discussion, which must have edified the chairman (well known as a builder, and late President of the Builders' Benevolent Institution), the following dialogue took place, according to the report of the *South London Press*:—

> Mr. Lawson: What was it which kept up a church? (A voice, "An arch,") No, not an arch. Something in architecture. (Laughter.)
>
> Mr. Stafford: You mean the foundation-stone. (Loud laughter.)
>
> Mr. Lawson: No, not the foundation-stone. (Laughter.) Let me see,—the keystone. That's it. (Laughter.) Don't let us take away the keystone.

New Reredos, Cockington.—A new reredos in the parish church of Cockington, near Torquay, was unveiled on the 28th of August. The church, dedicated to SS. George and Mary, is an ancient Gothic building, pleasantly situated in the grounds of Cockington Court. The new reredos, which is a special gift, has been designed by Mr. James Hine, architect, Plymouth, and is in the Late Decorated style. It is made of English oak; the lower parts are enriched by linen panels, surmounted by a carved cornice. Above the altar-table the entire length of the reredos proper is formed, in the main, of seven continuous and connecting canopies. These, in each instance, spring from sculptured angels bearing shields, upon which are emblazoned the various emblems of the Passion. The recessed panel is of chestnut wood, and upon it is painted a representation of the Last Supper. This painting is by Mr. J. T. Fouracre, of Stonehouse, Plymouth. The new reredos has been made and carved by Mr. Harry Hems.

Building Societies.—A return has been issued of an abstract of the accounts furnished by building societies incorporated to the 31st of December, 1880, under the Building Societies Acts. The total number of societies reported upon, of which twenty-three are dissolved and twenty-one are in default, is 1,267. Only 1,015 of them report their membership, which amounts in the aggregate to 372,035. In 1,115 instances the total amount of receipts is returned at 18,694,555*l.*, and in 1,111 cases the liabilities are set down,—to the holders of shares, 21,813,095*l.*; to depositors and other creditors, 14,079,762*l.* In 903 societies the balance of unapportioned profit is returned at 1,104,735*l.*, and in 167 societies there is a balance deficit of 47,209*l.* The aggregate assets of the whole of the societies are returned as,—balance due on mortgage securities (not including prospective interest), 34,847,320*l.*; amount invested in securities and cash, 2,103,060*l.*

The Japanese Theatre.—Mr. Robert Irwin, in his capacity of Hawaian Consul, has just presented a very beautiful drop curtain on behalf of H. M. King Kalakaua to Mr. Morita, lessee of the Shintomiza Theatre. According to the *Japan Weekly Mail*, the curtain is of crimson Japanese velvet. The Hawaian royal coat of arms is embroidered in gold in the centre, and distributed on each side of this in white silk embroidery is the inscription,—"Presented to the Shintomiza Theatre by Kalakaua the First, King of Hawaii, in the second month of the year 2541 (Japanese era)." The curtain was manufactured by Nishimaru & Co. of Kiyoto, and is, we understand, the handsomest thing of the kind that has ever been used in a Japanese theatre.

Old Shrewsbury.—As some workmen were engaged last week in renovating the upper front portion of premises in Wyle Cop, Shrewsbury, occupied by Mr. Taylor, fishmonger, which for the duration of two leases of ninety-nine years were in the occupation of a county family named Lloyd, they knocked off some old thick plaster, and with it the rose of an ancient piece of carving. This led to a careful search being made, resulting in the discovery of a Perpendicular window of the time of Henry VII. in a wonderful state of preservation. The window has three lights with quatrefoils above. Above the window is a curved projection supporting the upper chamber, which has ribs of timber, each of which spring from a corbel. The cornice above the curve is a fine embattled one, and it is thought that above it is a concealed window similar to the one which has just been brought to light. It may be stated that the window discovered is of oak, but exactly similar in design to one in the Abbey Church in Shrewsbury, which is distinctly Perpendicular, and, therefore, there can be no doubt as to the date of that in question. Archæologists are decidedly of opinion that the room in which the window is placed was occupied by Henry VII. on the night before the battle of Bosworth, which decided the fate of Richard III.

Marble Work.—The largest work in decorative marbles yet done in the West of England is making rapid progress at Messrs. J. & E. Goad's Phœnix Marble Works, Stonehouse. The contract which Messrs. Goad are executing is the marble work for the church of the Brompton Oratory, South Kensington, now in progress. The arcading of the whole building will be supported by columns of Devonshire marble, and massive shafts with pilasters of similar stone will uphold the central dome and flank the entrance of each chapel. All the plinths throughout will be of Devonshire black, from the Billacombe and Pomphlete quarries. The dado-work will be of dark mottled, also from Pomphlete. The moulded base of each pilaster is a picked specimen of green marble, which also comes from quarries in Devonshire. The shaft of each pilaster will be of red Devonshire marble, cut in the quarries at Radford. The plinths of the columns, like those of the pilasters, will be of Devon black, the moulded bases of a sienna-tinted variety from Radford, and the columns themselves of a mottled stone from Pomphlete.

The Church Congress of 1881.—The arrangements for the Church Congress at Newcastle-on-Tyne are approaching completion. The Congress opens in the Town Hall on Tuesday, October 4th, and will be in session for four days. The Congress will discuss a variety of subjects of general interest at the present time, amongst them the modes by which religious life may be influenced by art, and the relation of the Church to the social movements of the day, with special reference to trade unions and co-operation. It is understood that Sir T. Brassey, M.P., will treat of the relation of the Church to the social movements of the age, with special reference to trade unions and co-operation. Mr. Beresford-Hope, M.P., is one among the speakers on the subject of the modes in which religious life and thought may be influenced by art.

Memorials of the Dead.—We understand that a National Society for Preserving the Memorials of the Dead in the Country Parish Churchyards of England and Wales is in course of formation, and among those who have joined the society are the Earl Beauchamp, the Earl of Carnarvon, the Earl of Glasgow, the Earl of Northesk, the Lord Talbot de Malahide, the Bishop of Ely, the Bishop of Argyll and the Isles, the Right Hon. A. J. B. Beresford-Hope, M.P., Mr. Stanley Leighton, M.P., &c. It is proposed shortly to hold inaugural meetings in London. Any persons desirous of joining are requested to send their names to Mr. Wm. Vincent, Belle Vue Rise, Lower Hellesden-road, Norwich, from whom all information, with copy of suggested rules can be had.

Sluicing the Pluckington Bank, Liverpool.—Sluicing operations for the removal of this obstructive bank in the Mersey were commenced on Saturday afternoon, at low tide, from three of the new pipes which have lately been constructed at the back of the George's Stage. The sluicing was continued on Monday; and on Tuesday, seven of the pipes were in operation during low water, and the effect on the bank is reported to have been everything that was expected.

The Sanitary Condition of Oxford.—A special meeting of the Oxford Local Board was held on Monday last to consider a letter received from the delegates of the university lodging-houses, with reference to the sanitary condition of their houses. A warm discussion ensued, many of the board considering that their authority had been usurped by the action of the university in calling in Mr. Griffith before they had been consulted; and it was held that many of the alterations suggested by that gentleman were not necessary. Mr. Laker moved that no further work be carried out, as ordered by Mr. Griffith, until his plans had been submitted to and approved by the Local Board; but he afterwards withdrew his proposition and seconded that of Alderman Galpin, "That a committee be formed to confer with the delegates of the lodging-houses with regard to the plans submitted to the Board by Mr. Griffith," which was carried unanimously. Alderman Hughes, the chairman of the Board, expressed his surprise at what had appeared in some of the London papers respecting the sanitary condition of Oxford, for he maintained that the city had been for years past in a very healthy condition, as evidenced by the Registrar-General's returns.

Irish Marbles.—Mr. George Aitchison, A.R.A., in a letter to the *Times apropos* of Irish industries, says that now marble is being largely used for interior decoration, it would be advantageous to have some place in London where all the Irish marbles might be seen. Irish red, Irish green, and Irish black marbles are well known and largely used, but the green Irish porphyry is scarcely known, and there may be many other Irish marbles which would be used if they were known. Although the ordinary Irish green marble, with its streaks of green, grey, and brimstone colour, is not a very effective marble, small portions of it are of the most lovely colour and quality imaginable, looking like dark green seaweed beneath the clear sea. What is wanted is a depôt with a showroom attached, containing large polished specimens of every sort, with the prices per foot marked on; the depôt to contain a good stock, so that the slabs or blocks might be chosen on the spot. It is very disappointing to have to wait until the marble can be sent from Ireland, and then to find that it is totally unlike the specimen chosen. He had a string executed that was to have been green, but it turned out to be grey with hardly a green spot.

Threatened Eclipse of Mr. Spurgeon's Tabernacle.—"General" Booth, speaking in Exeter Hall, at a "Council of War" of the body known as the "Salvation Army," on Monday last, is reported by a daily paper to have aroused much enthusiasm by declaring that the "army" must have built in London "a Salvation Temple, which should be an anti-type of the Temple of Solomon, at a cost of 100,000*l*, which should be open day and night for pilgrims from all parts of the earth." Here is a chance for those who go in for "big things" in the way of competitions; for, of course, for a building of this size (we are told it is to hold 10,000 people), if it ever comes to be erected, there will be a competition?

St. Giles's, Edinburgh.—In the course of the restoration of St. Giles's, Edinburgh, an arched recess has been discovered in the north wall of the Albany aisle, which was built by the Duke of Albany and the fourth Earl of Douglas as an expiation for the death of the Duke of Rothesay. The *Athenæum* says,—"This arched recess is 8 ft. high and 7 ft. wide, with a depth of 2 ft. or 3 ft. On the front of the arch is an exceedingly fine moulding of the thirteenth century, but it is more than half destroyed. Dr. Chambers has ordered the restoration of the moulding, and intends to place a recumbent figure in white marble of the Duke of Rothesay in the recess."

The Iron and Steel Institute will this year hold its autumn meeting in London, and the dates fixed are the 11th, 12th, 13th, and 14th prox. The meetings for the readings of papers on the three first days will be held at the Institution of Civil Engineers, and on the first day the Institute will be received by Sir Henry Bessemer, F.R.S., the president of the Local Reception Committee, and by the vice-president, Dr. Siemens, F.R.S.

Regent-street. — The owner of the new Panton-street Theatre has purchased some large premises in Regent-street, which he intends forthwith to convert into a Jews' synagogue. Mr. Thos. Verity is to be the architect.

The Luminous Paint.—Something seems needed to increase the usefulness of this material, and to give it a wider application. A correspondent writes,—"I brought a bottle of the luminous paint from York, a bottle about 4 in. high and 2 in. in diameter, and nearly emptied it in painting a card-board about 1 ft. long by 8 in. broad; so at present it is an expensive amusement. But the worst part is the nauseous odour! It is most horrible! For indoor work some change must be made, or the paint will be utterly unusable. Moreover, as the luminosity must be frequently refreshed by exposure to strong light, I do not see how it can be made available for dark passages, cellars, and such like." We see it stated in Eastern Counties newspapers that this paint is being used by the Post Office authorities for surrounding the apertures of wall and pillar boxes, and with much advantage in rural districts unprovided with gas.

Topsham Church.—The ceremony of restoring the flags of the Devon and Cornwall Fencibles to the Parish Church of Topsham, where they hung for a period of seventy-two years, was performed on Tuesday last by Mr. S. C. Hall, F.S.A., the well-known author, and only surviving son of Colonel Robert Hall, the commander of the Devon and Cornwall Fencibles, by whom the colours were presented to the church in 1802, when the corps was disbanded. They were removed from the church a few years ago during the rebuilding of the structure, and came into the possession of Major Keating, by whom they were lately presented to Mr. Hall, who has now restored them to the church. We are glad to hear that Mr. Hall, who is now nearly eighty-two years of age, has greatly improved in health during his recent sojourn in Devonshire.

Wistanstow, Salop.—A stained window has just been placed in the north transept of the parish church, in memory of the late Mr. John Hoggins and his wife, and other members of the family. The subject chosen is "The Ascension." The stonework of the window is of the Early Decorated style, with three lights. In the centre light the figure of Our Lord appears ascending, surrounded by a halo of light, while two disciples kneel on the ground beneath. In the two side lights other disciples are seen in different postures of adoration. It has been executed by Mr. John Davies, of the Wyle-cop, Shrewsbury.

TENDERS

For pulling down Cook's Almshouses, Mile-end-road, and rebuilding six houses and shops, for Mr. A. Barnett, Messrs. H. S. & C. A. Legg, architects:—

Longman	£5,199	0	0!
Knight	4,090	0	0
Parrish	3,736	0	0
Caluan	3,700	0	0
Stephens	3,644	0	0
Williams	3,150	0	0
Gentry	3,090	0	0
Lusk	3,070	0	0
Button Bros.	3,040	0	0
England & Thompson	2,994	0	0
Judd	2,700	0	0
Chubb	2,112	0	0
Simpson	1,866	0	0!

For the erection of two pairs of semi-detached houses, Champion Park, South Dulwich. Mr. A. Stanton Cook, architect:—

E. J. Godbold, Ilford (accepted).

For the erection of a stable and coachhouse at Pen Close, Uxbridge, for Mr. E. W. Woolls. Mr. Geo. Eves, architect:—

Hall (accepted) £25 10 0

For roadmaking, and sewering a new road, Southend-on-Sea, for Mr. D. R. Scratton:—

Wilkes & Co., London (accepted).

For alterations at the Hampton Court Palace, Hampton-street, Walworth, for Mr. W. Barnes:—

Cabinet and Fittings.

Turner & Price (accepted).

Pewtering.

Mathews (accepted).

For house, fence-walls, &c., in the Chape Park-road, St. Leonard's. Mr. A. Bradley Rooke, architect. Quantities by Mr. E. J. Paine:—

Womersley (too late)	£1,350	0	0
Cruttenden	1,346	0	0
Howell & Son	1,330	0	0
Vidler	1,290	0	0
Rodda	1,290	0	0
D. C. Jones & Co., Gloucester	1,273	0	0

For general repairs and renovation of Hughenden Manor, for the Executors of the late Right Hon. the Earl of Beaconsfield:—

Lilley & Wood (accepted).

For drying warehouse to Messrs. Jenne & Co.'s (Limited) floor-cloth factory, Stratford-by-Bow. Mr. A. Bradley Rooke, architect. Quantities by Mr. E. J. Paine:—

Harper, Hackney	£2,573	0	0
H. G. Smith, Poplar	2,560	0	0
Salt, Bow	2,428	0	0
Maitock Bros., Holloway	2,379	0	0
Tongue, Plumstead	2,270	0	0
Jones & Co., Gloucester	2,187	0	0

For the erection of a private hotel in Arundel-street, Strand, for Mrs. Schram. Mr. J. Dunn, architect. Quantities by Messrs. Nixon & Raven:—

Kirk & Randall	£9,555	0	0
Mowlem & Co.	9,300	0	0
Bywater	8,990	0	0
Morter	8,843	0	0
Patrick	8,475	0	0

For studio and chambers, Chalcot-gardens, Englandlane, Hampstead, for Mr. Towneley Green. Messrs. Batterbury & Huxley, architects:—

Manley, Regent's Park (accepted).

For alterations and additions to "Drewstead," Woodfield-avenue, Streatham, for Mr. Alfred Ashton. Mr. Alfred Burr, architect:—

Philps & Bisiker	£1,070	0	0
Richardson Bros.,* London-wall	845	0	0

* Accepted.

For stables, coachhouse, &c., with living apartments over, Dulwich, for Mr. J. May. Mr. R. Peters, architect:—

Pierse & Banyard	£500	0	0
Watson & Dennett (accepted)	450	0	0

For proposed villa residence, Finchley, for Mr. W. T. Dippie. Mr. Richard Peters, architect. Quantities by the architect:—

Parrish	£1,198	0	0
Shepherd	1,163	0	0
Grover	1,162	0	0
Merritt & Ashby	1,133	0	0
B. Downs	1,060	0	0
T. Ennor Julian & Co. (accepted)	1,030	0	0

For new roads and sewers on the Hornsey-lane Estate, for Mr. Thomas Dence:—

Bloomfield, Tottenham	£1,440	0	0
Jenkins, Clapham	1,421	0	0
Keeble, Regent's Park	1,345	0	0
Pall & Sons, Bromley	1,299	0	0
Harris, Camberwell	1,250	0	0
Pizzey, Hornsey	1,227	10	0
Jackson, Leyton	1,200	0	0
McKenzie & Co., City	1,102	0	0
Duumore, Hornsey (accepted)	1,115	0	0
Wilson, Walthamstow (too late)	1,095	0	0

For the erection of warehouses, No. 29, Farringdon-street, for Mr. R. J. Worley. Mr. R. J. Worley, architect. Quantities by Mr. Fife:—

Toms (accepted) £3,330 0 0

For erecting two shops and offices, Nos. 278 and 279, High Holborn, for Mr. R. J. Worley. Mr. R. J. Worley, architect. Quantities by Mr. Fife:—

Smith	£2,569	0	0
Lawrence	2,383	0	0
Toms (accepted)	2,239	0	0

For pulling down and rebuilding the Stationers' Arms public house, High-street, Camden-town, for Mr. Charles Smith. Mr. William West, architect:—

F. & F. Wood	£4,895	0	0
Macey & Sons	4,238	0	0
Young, Cochrane, & Fraser	4,095	0	0
Turtle & Appleton	4,039	0	0
Patman & Fotheringham	3,960	0	0
Bowden	3,785	0	0
Williams & Sons	3,770	0	0
White	3,764	0	0
Toms (accepted)	3,643	0	0

For alterations, additions, repairs, &c., at the Mansfield Arms, Mansfield-place, Kentish-town, for Messrs. Meux & Co. Messrs. Gardener, Sons, & Theobald, architects. Quantities by Messrs. Selby & Rogers:—

Johnson	£1,450	0	0
Tetmas	1,340	0	0
Nightingale	1,197	0	0
Toms (accepted)	1,116	0	0

For erecting new dwelling-house in Pratt-street, Camden-town, for Mr. Blomfield. Mr. Henry Jacques architect:—

Toms (accepted) £435 0 0

For alterations and additions to stabling of the New Forest Hotel and Posting-house, Lyndhurst Railway Station, for Messrs. Hine Bros. Mr. W. H. Mitchell architect:—

C. R. White	£648	10	0
Thos. Carpenter	594	16	0
Chas. Pike	535	0	0
J. W. Rowland	449	0	0
J. Crook (accepted)	417	0	0

For alterations and additions to Nos. 1 and 2, The Fire Potters Bar, for Mr. G. Mills:—

Eldridge & Gee (accepted).

For a pair of semi-detached dwellings, without foundation work, for Mr. David Tildesley. Mr. Walter Graves, architect. Quantities by Mr. Walter Barnett:—

C. Kelland (accepted) £2,900 0 0

For the reconstruction of wine-vaults, Nottingham, exclusive of foundations, for Mr. H. G. Jalland. Messrs. S. Dutton Walker & Howitt, architects:—

Contract No. 6.

Vickers, Nottingham (accepted) ... £4,787 14 0

For rebuilding Bridge Wharf Brewery, Lewes, for Messrs. Harvey & Son. Mr. William Bradford, architect. Messrs. J. & A. E. Bull, surveyors:—

Patching & Son, Brighton	£4,388	0	0
Howard, Brighton	4,304	0	0
G. H. & A. Bywaters, London	4,059	0	0
Cheesman, Uckfield	3,990	0	0
J. T. Chappell, London	3,976	0	0
Peerless & Son, Eastbourne	3,910	0	0
Card & Son, Lewes (accepted)	3,808	0	0
Harman & Floyd, Lewes (irregular)	3,800	0	0
Knight, Lewes	3,643	11	5
Engineer and Millwright's Work.			
Shears & Sons	1,248	0	0
Worssam & Son	1,239	0	0
H. Pontifex & Sons	1,190	0	0
R. Ramsden & Son	1,159	0	0
J. J. Bennett & Son	1,120	0	0
Pontifex & Wood (accepted)	790	0	0
Coppersmith and Pipe Work.			
R. Ramsden & Son	1,178	0	0
Worssam & Son	1,124	0	0
J. J. Bennett & Son	980	0	0
Shears & Sons	944	0	0
H. Pontifex & Sons	900	0	0
Pontifex & Wood (accepted)	790	0	0
Backwork.			
Worssam & Son	327	0	0
J. J. Bennett & Son	285	0	0
R. Ramsden & Son	249	0	0
Orley & Co. (accepted)	221	15	0
R. Whibley	208	10	0
H. Pontifex & Sons	200	0	0

For alterations and additions to the George IV. tavern, Vauxhall Bridge-road. Quantities by Mr. Edward Crutchloe:—

Boyce	£715	0	0
Foster	710	0	0
W. King & Sons (accepted)	698	0	0
Stiling	681	0	0
Badcock	604	0	0
Quinn	598	0	0

For alterations and additions to the Prince of Wales public-house, Merton-lane, Mitcham, for Messrs. J. Carter Wood, & Co., Westminster. Quantities by Mr. Edward Crutchloe:—

W. King & Son	£395	0	0
Norris	380	0	0
Faulkner	375	0	0
Percy & Peabody	335	0	0
Stiling (accepted)	324	10	0

For the erection of a house, Westcombe Park, Blackheath, for Mr. T. W. Powell. Mr. Edward Robert Robson, architect:—

Higgs & Hill	£3,229	0	0
B. E. Nightingale	3,143	0	0
Kirk & Randall	2,990	0	0
Wm. Tongue	2,960	0	0
Atherton & Latiffe	2,950	0	0
Wall Brothers	2,895	0	0
S. J. Jerrard	2,843	0	0
Wm. Oldrey (accepted)	2,794	0	0

For alterations to the Upper Holloway Baptist Chapel, Holloway-road. Messrs. Searle, Son, & Hayes, architects:—

		Extra if Stone facings.
Southcott & Co.	£2,183	£110
Bamford	2,181	115
Goodman	2,075	85
Dove Bros.	2,015	90
J. Harper (accepted)	1,955	195

For mineral water factory, Holloway-road, for Messrs. Cooper & Co. Mr. G. Corfé, architect:—

Vears	£1,824	0	0
Cross	1,650	0	0
Macfarlane	1,498	0	0
Harper (accepted)	1,342	0	0

For new schools, Gifford street, Islington. Mr. W. Smith, architect:—

Larke & Son	£1,870	0	0
Danford & Langham	1,689	0	0
Mattock Bros.	1,671	0	0
Harper	1,632	0	0
Shurmur	1,583	0	0
Cole & Chant	1,555	0	0
Stevens Bros.	1,548	0	0

For St. Matthew's Church, Brighton. Mr. John Norton, architect. Quantities supplied by Mr. S. J. Thacker:—

W. H. Webber	£13,350	0	0
G. Cheeseman & Co.	12,000	0	0
Goddard & Sons	11,131	0	0
H. J. Saunders	11,000	0	0
Stephens & Bastow, Bristol	10,999	0	0
Dove Bros.	10,995	0	0
E. Lawrence	10,795	0	0
Thos. Boyce	10,740	0	0
James Langley	10,690	0	0
Chappell (accepted)	10,473	0	0

For residence on the Stark's Hill Estate, Orpington, Kent, for Mr. B. W. Newton. Mr. G. St. Pierre Harris, architect. Quantities by Mr. C. Stanger:—

Crossley	£4,180	0	0
Sharpe & Mills	3,943	0	0
Taylor & Son	3,890	0	0
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Haisman (accepted)	3,664	0	0

For residence on the St. Thomas's Hospital Estate, Orpington, Kent, for Mr. T. G. Wharton. Mr. G. St Pierre Harris, architect:—

Pearse & Banyard (accepted)	£1,425	0	0

For drainage connexions to several properties at Orpington. Mr. G. St. Pierre Harris, surveyor:—

Davis & Attwood (accepted).

For new coachhouses to the Tiger's Head, and repairs to the "Laurel," Bromley, Kent, for Messrs. John Fox & Sons. Mr. G. St. Pierre Harris, architect:—

Grubb, Bromley (accepted).

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VOL. XLI. No. 2017. SATURDAY, OCTOBER 1, 1881.

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Pure Air and Purified Water: New Light on the Solution of the Sewage Problem.

THE most advanced science of the Middle Ages regarded all things as ultimately referrible to "the four elements." Fire, air, earth, and water were considered to be original entities or principles, and the visible species of the material world were regarded as partaking of fiery, airy, earthy, and watery mixtures. The classification was not confined to the surface of our planet: it was extended to embrace the heavenly bodies. The signs of the zodiac were divided into tetrarchies or tetramenies, the fiery, airy, earthy, and watery signs being always in trine aspect to one another, that is to say, four signs apart; and the planets themselves are spoken of as earthy or fiery, cold or moist.

The discoveries of Dalton and of Cavendish opened the door to a very different appreciation of the elements of chemistry. But some of the old associations yet linger. Above all we are accustomed to speak of the air as something everywhere present, and everywhere the same, "the air we breathe, without it we die."

We are, however, now aware that very great changes have taken place in the composition of the atmosphere, long since our planet was the abode of animal life. As to whether permanent change is still going on, we have no data on which to form an opinion; we can, however, conclude that the waters of the ocean are gradually becoming more salt. We know that in those cases (of which the Dead Sea is the most conspicuous example) in which rivers run into a basin from which the only escape is by means of evaporation, the water continually grows salter. A change of the same kind, however slow, must be occurring in the ocean, to which the rivers are constantly contributing the salts that they wash from their beds.

The effects of storm, tempest, and rain tend to maintain the general unity of condition of the atmosphere. But apart from that difference which is appreciable to the senses, in what we call the change of air from spot to spot, which is more probably telluric than atmospheric in its origin, very great differences exist in the hygrometric character of the air, in different localities, as well as at different seasons. Again, the atmosphere is at times locally loaded with smoke, with miasmata, and with the products of the respiration of animal and of vegetable life; and where masses of men are congregated, as in our great cities, and where walls and barriers prevent the free circulation of air,—above all, in badly-ventilated apartments,—the loading or vitiation of the atmosphere may proceed to such an extent as to make it unfit to support life. We must remember that it was not until chemical analysis had been carried to a high degree of delicacy that it became possible to ascertain either the quality or the quantity of the foreign elements mingled with a vitiated atmosphere. The most subtle test, after all, is afforded by the human lungs; and we know that so slight a change as that of the diminution from 2,096 parts out of 10,000, to 2,075 parts, in the oxygen of the atmosphere, that is to say, of 21 ten-thousandth parts, when the place is supplied by carbonic acid and animal exhalations, is most perceptibly injurious to respiration.

It is thus evident that there is a close connexion between such a subject, which we may call primarily one of an architectural order, as the ventilation of halls and buildings, and the poisoning by carbonic vapours, and by coal gas, and again as the practical manufacture of oxygen. These three subjects of study have been recently illustrated respectively in a French, a German, and an American scientific journal, and brief abstracts of the three papers in question will be found in the recently-issued sixty-fifth volume of the "Minutes of Proceedings of the Institution of Civil Engineers."

That the supply of oxygen gas, whether in that form, or in the state of ozone, is one of the most efficient, perhaps the most efficient, means of restoring the purity of the atmosphere, we think is indisputable. We see the effect of a powerful dose of oxygen in the case of the application of the liquid known as Condy's disinfecting fluid, the action of which on tainted water or sewage is so direct and certain. In fact, for purifying water from organic pollution, the supply of oxygen may be regarded as the one specific. This is the secret of the action of gravel or sand in purification of polluted water. Oxygen is admitted into direct contact with the particles of foreign matter in percolation, and, in point of fact, consumes them. So it is if oxygen is thrown into the polluted fluid chemically, as by means of the fluid we have named. The action of the oxygen is the same, whether it be mechanically or chemically supplied. But supply of oxygen to a vitiated atmosphere has been hitherto less studied than its application to polluted water.

The question of cost of production has stood much in the way of the utilisation of oxygen for sanitary purposes. M. E. Guitton, who is the inventor of a new process for the production of oxygen, contemplates the manufacture of his gas at the price of half a franc per cubic mètre and less in large quantities. This is just one per cent. of the price which the French theatres now pay for a supply of the gas. A cubic mètre contains 35·35 English cubic feet. Thus, ordinary coal-gas, at 3s. 3d. per 1,000 cubic feet, costs about 1½d. per cubic mètre; so that M. Guitton proposes to reduce oxygen to less than the price of coal-gas. It is evident that, if this can be done, an immense step will have been taken in the progress of sanitary application.

It has long been known that barytes possesses the power of absorbing oxygen from the atmosphere at a certain temperature, and giving it out again at a higher temperature. But the practical difficulty that has hitherto interfered with the utilisation of this property is, that after a certain number of repetitions of the process (about ten) the material used becomes inert, and incapable of continuing the same operation. The improvements introduced into the process by M. Guitton consist in (1) the preparation of the air, by the removal of carbonic acid and the supply of moisture, in order to render it easily decomposable by the barytes; (2) the use of pumps or fans to facilitate the peroxidation of the barytes; (3) the employment of a vacuum, or exhauster, for the extraction of the oxygen from the oxidised barytes; (4) the application of great heat, under the guidance furnished, by a special pyrometer; and (5) the preparation of the barytes itself.

The process is now being carried on at Passy. With an average of ten charges per day, forty cubic mètres of oxygen are obtained from 100 kilogrammes of barytes. The gas obtained was 95 per cent. pure oxygen. The 5 per cent. remainder was nitrogen, probably furnished by the atmosphere, owing to some defects in the apparatus. The cost was 0·619 franc per cubic mètre; but with increased production it is estimated that it can be reduced to 0·127 franc per cubic mètre, or 3½d. per 1,000 cubic feet. Oxygen made from chlorate of potash and binoxide of manganese costs 12 francs per cubic mètre.

The uses to which an economic supply of oxygen can be advantageously put are many. If it be applied to the combustion of charcoal, or of mineral oil, a splendid light is produced, at about one-third the cost of Paris gas. As to its application to the purification of the atmosphere, whether of rooms or of streets, we have to await experiment. But it is, in our opinion, a matter deserving the most serious attention to consider how far the boon which the talent of M. Guitton has supplied to industrial chemistry may lead to a solution of the most pressing and most perplexed of the sanitary questions of the day.

Of that foul and noxious flood which the Metropolitan Board of Works are now constantly pouring into the Thames, the poisonous and useless element is the organic matter, in various states of decomposition. Of the solid and liquid elements of sewage, apart from the water used as a carrier, the organic portion forms respectively 4·62 and 4·15 per cent., in weight. The ordinary dilution (exclusive of that by storm-water) is from 90 to 100 to 1. Thus out of 10,000 parts of weight of ordinary sewage, the poisonous element may be taken as 4½ parts. If this be removed or destroyed, the other foreign matters, mineral and gaseous, are not only unprejudicial, but have a chemical value of something over 4s. per unit of population per annum.

And the sewage utilisation problem is, how to extract this fertilising matter at a less cost than its agricultural value.

So serious has every experimenter found the cost of such extraction to be, that the idea of sewage utilisation, except under very favourable conditions, is gradually losing supporters; and it is indeed felt that the endeavour to secure a commercial value has greatly interfered with the progress that might otherwise have been made in the more urgent requisite of disinfection. For a considerable time our own opinion has been more and more steadily pointing to the conclusion that precipitation, filtration, and actual combustion of the solid deposit of sewage would have to be resorted to sooner or later. And as to this, the fact that the poisonous organic matter is itself combustible has led us to consider how far dried sewage may be made to consume itself, with but little extra fuel.

But if it be possible to drive through a volume of sewage a current of oxygen gas, the combustion of the organic matter will be effected in the most ready and complete manner. In point of fact, if a sufficient quantity of Condy's fluid were mixed with a stream of sewage, the results would be admirable. The barrier, of course, is the expense. The possibility of supplying pure oxygen is therefore to be regarded, not so much mechanically as financially.

Here there comes in the question, if oxygen can be supplied at less than the price of ordinary coal gas, does it not afford us what we require? Under any circumstances, it is the combustion of the organic matter which is the great aim we have in view. Is it likely that this organic matter, when once it has been collected in great unmanageable reservoirs, can be more cheaply destroyed in any other way than by admitting to it as it exists in solution or mixture in the sewage the dose of oxygen necessary for its combustion?

As to the cost, it is, no doubt, considerable. But the point to consider is,—can the object be attained by any cheaper method? That we shall long go on polluting the Thames without stint we do not conceive to be possible. The nuisance is becoming intolerable, and pestilence will follow if it is not abated.

Ordinary albuminous matter requires about nine times its own weight of oxygen to consume the hydrogen and carbon which it contains. In 10,000 gallons, or 100,000 lb. of ordinary sewage, there is, as we have seen, about 45 lb. of organic matter. To consume this is requisite 400 lb. of oxygen. Now, 11·89 cubic feet of oxygen weigh 1 lb., so that 4,760 cubic feet of this gas will be required to consume the organic matter in the 100,000 lb. of sewage. The cost of the gas, on M. Gaitton's showing, will be about 13s. 6d. The 10,000 gallons of sewage may be taken as roughly equal to the proportion per unit of population; and the chemical value of the mineral elements of the sewage has been some time back estimated at 4s. 8½d. per unit of population. Thus if the actually poisonous matter be destroyed by the admixture of oxygen, the mineral elements will remain in a condition in which they may be dealt with without danger and without disgust, and at least a third of the cost of the process may be recovered from its results.

This is not so brilliant an outcome as has been often anticipated. But the question is, can anything be substituted which is cheaper, and equally likely to be effective? We desire to put forward the suggestion with all reserve. It is one which demands not only reflection, but experiment, in order to determine its value. But we confess that a great reduction in the price at which oxygen can be produced seems to us, at all events, to cast a ray of light in the direction in which we have been for some time straining our eyes. It is this ray that seems to us to emerge from the process of M. Gaitton. We may be wrong. We may be too sanguine. But we feel convinced that the idea is one which should not be either scouted or neglected. It would, no doubt, require sustained experiment on a considerable scale to ascertain how much more than the quantity of oxygen that on paper would be fully equivalent to the combustion of all the organic matter in a given volume of sewage would be practically necessary in order thoroughly to purify that volume. The bit of experience which is most conclusive in our minds is the magical action of the fluid we have mentioned, which is much too costly for use on a large scale. But we call the attention of those of our readers who, like ourselves, have been long studying this great problem of civilisation, with good hope of some wholly unexpected solution. And we invite the ingenious author of the process (whom we only know from the pages of the "Resumé de la Société des Ingénieurs Civile," and from the "Minutes of Proceedings of the Institution of Civil Engineers"), to add any contribution that his own experience can suggest to our attempt at a fresh step towards a definitive solution of perhaps the most vexed problem of civilisation.

THE SOCIAL SCIENCE CONGRESS.

It is to be hoped that the attractions of Irish hospitality, as well as the more serious interest attaching to everything connected with that part of the Kingdom at present, will avail to counterbalance the disadvantage of the rather long journey which London members will have to take for this year's congress. It has generally been found that the attendance of the London contingent of the members is inversely in proportion to the distance to be traversed, a consideration which, we believe, operated against the attendance last year at Edinburgh. It may be said, however, that the capital of Ireland seems at present a very appropriate and suggestive quarter in which to discuss the graver problems of social relations, and we have reason to suppose that the brief and comprehensive theory of the relative positions of England and Ireland which was formulated by Moore,—

> "On our side is virtue and Erin,
> On theirs is the Saxon and guilt,"—

is not accepted by the Dublin promoters of the Congress as an accurate representation of the position. The long list of names in the local committees seems to indicate a considerable interest in the matter, at all events in the Irish capital.

The special questions in the legal and educational departments seem to be of serious import and of more than usual interest; on these we are not called upon to comment. But we cannot look without special interest at the announcement of the first question to be considered in the Economy and Trade Department, as to the results that may be expected to arise from the extension of the system of participation by labour in the profits of manufacturing, agricultural, and trading enterprises. We have long approved this system and desired its extension, and have often recommended it, notwithstanding what has been said as to failures, as the most promising solution of the problems arising from the at present conflicting interests of employers and employed, and we cannot but hope that some decided stimulus to the further extension and adoption of the system may result from the discussion of the question at Dublin,—at all events, that its value and hopefulness as a means of promoting true mutual understanding between labourers and capitalists may be brought home to many who have, perhaps, not duly considered the subject before. The third question in the same department,—What industries could be advantageously developed in Ireland, which from natural causes are specially suitable to the country?—is one of the greatest and most special interest to Ireland at this moment, though we fear we must not be too sanguine in expecting any very large or immediate results from it; still, some suggestion of value may be thrown out, which may bear fruit at a favourable moment.

The special questions for consideration in the Health Department deal entirely with the legal aspects of sanitation; they are not concerned with mechanical means of ensuring healthy conditions, but with the legal means of controlling the population so as to lead them in the paths of righteousness as contemplated from a sanitary point of view. The question whether hospitals should be placed under State supervision, which is the first on the list, is one in regard to which we should feel very doubtful whether any but a qualified assent could be given. The question here, as between the advantages of private and of Government management, suggests somewhat the same kind of *pros* and *cons.* as the question of Government interference with railway management. In regard to the latter, it is believed that the interests of the public are better served by allowing each company to adopt its own manner of working and its own plans of construction than by the Government imposing any uniform system upon all. So with hospitals: we imagine that no persons are so desirous to keep hospitals under the best sanitary conditions as the medical superintendents themselves, and that it would be much more desirable to allow scope for the exercise of individual judgment and for reasonable liberty of experiment than to impose a set of hard-and-fast rules on hospital authorities. Government inspection, if adopted, would be better confined to advising and reporting in the main; though the results of a general survey, extending over some years, by competent Government officials, might be very well and advantageously summed up in a general code of recommendations derived from the total result of this experience. To the third question,—Is any further legislation necessary to more effectually prevent the overcrowding of dwelling-houses?—we imagine a very decided affirmative will probably be returned. It seems certain at least that either the present legislation in itself, or its practical method of operation, is deficient in efficacy to check this evil.

Of the three questions forming the special subjects for discussion in the Art Department, one is of a practical and business character, and the other two are more vague in their objects, and touch more nearly on the ever-vexed question of "taste." The practical subject is that of copyright as regards music, painting, sculpture, and the fine arts generally, considered in relation to the Bill on the subject to be introduced into the House of Commons. We expressed a part of our mind upon the difficulties in connexion with artistic copyright some time since (see *Builder* for February 15th, 1879). The subject is one of the most awkward to deal with in a legal manner, partly on account of the difficulty in defining what constitutes infringement of copyright in regard to a work of art, and also the difficulty of settling what is equitably due both to artist and purchaser. We may call attention to the fact that music, although grouped with arts of design in the heading of the question, in reality does not stand on the same footing, but is under conditions much more nearly allied to those which operate in the case of literature, and might better be treated in that connexion. A printed piece of music is like a printed book; it can be said at once whether it is a piracy or whether it is not; but a design is a more delicate matter. It may be copied so as to get all that is of most value in the idea and execution, and yet so as to evade the charge of actual copying; or it may be reproduced (which is what the artist dreads just as much) in what is intended as a faithful copy, but so clumsily executed as to libel the original work, and injure the repute of the artist with those who have not seen the original. With this chance hanging over him, the artist not unnaturally wishes to prevent any one making copies, save under his own supervision,—a matter which, in the case of works that are accessible for public inspection, is very difficult to accomplish, and the most rigorous laws on the subject may bring him no nearer intercepting the transgressors. The purchaser has his interests also, which are of a more commercial kind, but not on that account any more easily defined and protected by law. The purchaser has paid money for the picture, or statue, or whatever it be, and having done so he can place it in his private house, in his inner chamber if he will, and have the full and uninterrupted enjoyment of it; but he demands more than this: he demands that no one else should have the enjoyment of it,—in other words, that the artist shall not furnish a similar painting or statue to any one else. If the question were argued on artistic grounds only, this attitude would hardly be defensible at all: it would be properly regarded as a selfish and dog-in-the-manger policy; but the subject is complicated by the fact that paintings cost money, and represent, therefore, a money value which the owner may some day wish to realise, or even be compelled by circumstances to endeavour to realise as far as possible, and he has then some reasonable ground of complaint if he discover that, say, three other persons have replicas of the painting, and that one of them obstinately claims that his own is the original, and thereby brings down the value of the real original at a time when its owner is very desirous to realise as much of that value as possible. This seems, perhaps, a very low view to take of the value of a work of art, but the value of works of art has its commercial side, and there can be no question that artists have occasionally very unfairly ignored this fact in their production of replicas; and that, although the question of artistic copyright is of more importance to the artist than

to any one else (since it touches him in repute as well as in pocket,—"who steals my purse, steals trash," &c.), still it has its importance to the purchaser, whose interests ought not to be ignored.

The second special question,—What should be the relations of painting and sculpture to architecture?—seems to involve two questions, that of the province of the architect, and the relation in which he is to stand to the sculptor and painter, whether as overlooking and controlling their additions to the building, or whether merely preparing a frame for them to fill in as they please; and the relation of architecture itself to sculpture and painting, and how far it is to be regarded as a genuine "art" independent of them. The question touches upon some interesting points in regard to the practice of architecture, and of what may be called monumental art generally. The third question, as to the influence of the annual exhibitions of sculpture or painting upon the public taste, appears rather vague, but it is quite possible to treat it so as to lead to some practical results,—at all events in regard to one point (which has been before touched upon in the Art Section), viz., the desirability of some control being exercised over the at present unlimited scope afforded to Royal Academicians to hang anything they please and as long as they please,—a liberty the unchallenged indulgence of which has already led to strange and even ludicrous results in some of the annual Academy Exhibitions, and which we imagine some of the more eminent members of the body would be very glad to see judiciously restricted.

There is, at all events, plenty of scope for discussion in these three subjects in the Art Section; and Sir R. Stewart, the Professor of Music in Trinity College, Dublin, is also to read a paper on musical education, and there will, no doubt, be other subsidiary papers not yet officially announced.*

THE MIDDLESBROUGH JUBILEE.

Commemorative of its commencement, the busy town of Middlesbrough-on-Tees is proposing to celebrate its jubilee. It intends to unveil a statue of Mr. Henry W. Bolckow, one of the chief of its ironmasters in the past, its first mayor, its first member, and the head of that firm which played so great a part in the development of the town. It honours the memory, also, of Mr. John Vaughan, Mr. Bolckow's partner, and of Mr. Joseph Pease, its projector. In the celebration Lord F. Cavendish takes a principal part, and Earl Granville, Sir Thomas Brassey, and other distinguished men, are to be present; whilst, subsidary to the chief feature, there are to be processions and fireworks, electric-light displays, and a banquet for the chief guests. It is slightly over fifty years since the commencement of Middlesbrough, but the delay in the holding of the jubilee enables the day to become also the occasion of the unveiling of the statue, and of the presentation of portraits.

Middlesbrough was projected by the promoters of the first public railway as a port for the shipment of coal, and rather over fifty years ago the first shipment was made. On that foundation the town was commenced, the site at the time of the purchase of the land being at the best agricultural land, and the population under two score. But, under the influence of the directors of the Stockton and Darlington Railway, the young town grew, attracted one or two small manufactures, and at the end of the first decade, after its practical commencement, it had a population of 5,709. In the next decade, the census of 1851 showed an increase only to 7,893, although the iron trade had been introduced in a small way into the town. But the supplies of ironstone in some of the lead and coal mining districts of Durham had given out, and as the demand for iron increased with the development of the railway system, ironmasters had recourse to the iron deposits of the southern part of Cleveland, and sought for the continuation of these deposits in the northern part. Here, rather over thirty years ago, that discovery was made which changed the fate of Middlesbrough,—the outcrop of iron being "found" in the high ground flanking the river Tees to the east of Middlesbrough, by Mr. John Vaughan, one of the partners in the firm of Bolckow & Vaughan, the leading ironmasters. The utilisation of that discovery changed Middlesbrough from being a mere coal-shipping port to one of the chief centres of iron production and manufacture in the world; made millionaires of the two principal ironmasters; and developed what had been a remote and isolated district until it is one of the most populous and prosperous towns in the North. By 1861, the population had risen to 18,273; in 1871 it was 39,434; and the recent census has shown that that growth continues, the return giving the present population at 55,978.

Before the discovery of iron at Eston, the total production of the north of Yorkshire was under 100,000 tons yearly; but the cheaply-wrought ironstone close to abundant facilities for its disposal has so stimulated the trade that the production has risen almost without a check until last year the extraordinary quantity of 6,441,783 tons was extracted from the Cleveland mines. No blast-furnace existed in Cleveland or on the banks of the Tees at the time of that discovery; but there are over 100 now,—a vast smelting plant which is larger on an average, and more productive, than that of any other iron-making district. And there has been in the half-century a growth as full, in comparison, of finishing ironworks, of foundries, of shipyards, and others of the iron-consuming industries, so that the whole of the north-east of England has felt to the full the benefit that has arisen from the growth of the great iron-producing and manufacturing centre. In the past decade, the district felt the force of the depression doubly, and that because, in addition to the general causes, there was the special effect arising from the fact that Cleveland iron was unsuitable for the steel manufacture. Continuous efforts have resulted in the resort to the dephosphorisation process, by which the vitiating elements are eliminated from the Cleveland iron in the Bessemer converter, and it is thus adapted for the manufacture of the more enduring and increasingly preferred metal. And thus there has sprung up, and is springing up, in the Cleveland district a newer industry, which is largely contributing to the removal of the effects of the depression of four years ago.

The half-century whose passing is to be commemorated has built up the chief town in Cleveland and the great industry on which it and others depend, and given to it all the essentials of vigorous town life. The rateable value of the thrice-extended borough has been raised in the five decades from a few pounds to 200,000*l*. Its School Board has provided accommodation for 4,310 pupils; its free library numbers many thousand borrowers lately; its gasworks make 166 million cubic feet of gas yearly; and the Middlesbrough part paid in the last half-year 15,114*l*. for the water it needed from the jointly-held waterworks; whilst the inadequate supplies are forcing the adoption of a vast scheme of reservoirs in Baldersdale. These are indications of the growth of the iron town, which boasts that it is the chief centre of iron production, and owns the greatest steelworks in the world. To those who fostered that trade, and gave to it the abundant supplies of cheap minerals on which it is built, it has long professed gratitude, and takes advantage of the jubilee celebration to put it in enduring mementoes. It has had its checks to prosperity in the dulness that it knew down to a year ago, but it is now about to make a further spring forward, and thus it is that the jubilee celebration may be said to divide the past from the future of Middlesbrough, and to separate the small coal-exporting town which has become the centre of the crude iron trade from that of the future, the dependence of which will be, it is in every way certain, upon some of the forms of steel manufacture, and probably on that of the Bessemer trade.

Birkbeck Literary and Scientific Institution, Southampton-buildings, Chancery-lane.—The 59th session of this Institution will commence on Monday next. Evening classes, which are open to both sexes, are held for the study of Ancient and Modern Languages, Mathematics, Natural, Applied, and Mental Science, Literature, History, Law, Art, Music, &c.; in fact, every opportunity is offered at this Institution for students to prepare for any occupation or profession. The fees are very moderate. The committee again appeal for contributions towards the new building.

BUXTON.

Remembrances are brought up at Buxton of those mountains Bunyan speaks of, where the rivers flowed with "fine trees on both sides," the meadows "are green all the year long," and where "all things are managed to the supporting of the weak." It is, indeed, the paradise of the invalid, but it is more than that,—it is the resort alike of the valetudinarian and of the pleasure-seeker; and hence lovely youth and crabbed age together press the floor of the pavilion, or watch the lawn-tennis players in the grounds. It is long since Buxton established its fame as a health resort, and to it there comes, summer and winter, a constant stream, to exercise the bath chairs that darken the front of the Crescent, or to wander in pairs by the banks of the Wye. The old Romans, who are supposed to have known the baths, were the predecessors of those who three centuries ago deemed them the most fashionable resort in the kingdom. Dukes and earls have been the benefactors of the little town. The ill-fated Queen Mary visited it in her imprisonment, and left on the window of the old hall her tributary farewell to the "milk-warm waters" of Buxton, and with the patronage of kings and queens the town rose into that pre-eminence that it still holds. Its attractions are natural and acquired. It is in the midst of some of the most noted scenery of Derbyshire; it has near to it some of the quaint and pretty rural nooks that attract visitors, but do not themselves provide for the continuous and comfortable stay of strangers; it has added to the charms of wood and water that it possesses; and it has springs and baths the medicinal value of which has been long esteemed. To these, the dukes of Devonshire in the past have added much. That fine pile, the Crescent Buildings, on which a century ago 120,000*l*. were spent; the terracing,—to coin a word,—of the rising-ground in front, under the direction of Paxton; the damming-up of the Wye till its waters form pools and cascades; the designing of the gardens and grounds of the Improvements Company; the erection of churches, chapels, and hospitals; the enlargement of ancient hotels, and the growth of villas,—these are the indications of the growth that chiefly in the last few decades has marked Buxton.

In its season there is no more perfect panorama of life in its many stages than is to be seen in this Derbyshire haunt. By the side of the perambulator is to be seen the Bath-chair of age that clings to life with a tenacious grip and hobbles to the pure air around these "delectable mountains" to stretch out its latest days; whilst around them are all the intermediate stages. In the early morning the number of Bath and invalid chairs drawn up in front of the baths, with their attendants, is a revelation of the popularity that Buxton possesses for invalids; whilst the tripping of fleet feet along the arcade in rainy weather, or the light laughter that in sunny days makes musical the paths that lead to Diamond-hill,—these portray the pleasures of youth in the ancient health resort. For all ages Buxton caters. It has its rink for the youth, its pavilion and gardens for the middle-aged, its baths for the infirm. When music arises "with its voluptuous swell" in pavilion or garden, there are revelations of the fashion of the visitors near; when sounds the bell there is along the colonnade a troop of the distinguished, and their vulgar followers, sufficient to make the old hotels gay, and to people the rooms of many of the villas. Buxton has recognised the fact that it needs to add to natural beauty the essentials of comfort, and of pleasant, social life, and these draw from a large and growing area the visitors on whose patronage the place depends. For it is a place apart from manufacture, and where commerce presents only the modest guise of an attendant upon pleasure. In the gray streets of Buxton, trade, in its ordinary sense, does not enter,—the neat shops are the temples of ministers unto the wants of fashion, and the trains that enter the station bear the invalids or the pleasure-seekers only. It offers to these pleasant society, comfortable homes, a retreat alike from the cares of business or the jading life of fashion in great cities. Away from the flutter and frivolity of Mayfair,—from the stress and strain of brainwork in Westminster, or from the guidance of great concerns in the manufacturing regions, this little nook,—an hour or two apart, but with the quietness of years between,—gives freshness in its valley and "knits up the ravelled" skein. All around it is the wonderful scenery of the Peak country,—

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* A meeting of the Council of the Association will be held on Monday morning next, at Trinity College, Dublin, for preparatory business, and in the evening of that day the president, Lord O'Hagan, will deliver the inaugural address.

valleys such as that of Edale, caverns such as those of Castleton, mountain passes like Winyates, bleak moors like Millstone Edge, quaint villages like Eyam, where ancient customs die slowly, haunts of the artists such as Millersdale, resorts of the curious such as Haddon Hall, and that boast of Britain, Chatsworth. It is, then, no wonder that to this once solitary spot,—still retired from the stress and the struggle of life, there come increasingly those who desire to hoard the little strength left them, and those also who steal a brief respite from the struggle. Other and newer health resorts rush into a bourgeois popularity, and by dint of the blazoning of trumpets rise and fall in the fluctuations of fortune and trade, but this gem of North Derbyshire is secure in the patronage that its ancient fame and its present attractions give it, and all the year it draws to itself a distinguished circle.

FRENCH ART INDUSTRIES AND FOREIGN COMPETITION.

There has been, for some time past, a gradual dissatisfaction growing up among the rising artistic notabilities of France; an infinitesimal number of men have even ventured to opine that there was something wrong in France, after all; and the foremost promoters of art for art's sake, of art in every department of life, have discovered that in the home of the cold and calculating islander who loves nothing but his shop and his money-bags, there is an institution deserving mention, — nay, deserving imitation. Need we say that the institution in question is South Kensington? The men who have gathered round the founders of the French Museum of Decorative Art are in advance of their countrymen, and are anxious to see established, throughout France, schools after the pattern of our South Kensington schools. The establishment of schools such as those of England, of Austro-Hungary, of Bavaria, of Russia, of Belgium, is the great cry of the advanced artists in France. We were not surprised, then, to read in the *Review of the Decorative Arts* (*Revue des Arts Décoratifs*: A. Quantin, 7, Rue St. Benoît, Paris), an extremely large-minded and circumstantial article, which the author entitled, "A Danger," and in which he gives the French art-world a few serious and timely hints. He tells Frenchmen that they have for too long taken their supremacy in art as a matter of course. It has been said from time immemorial that France is the home of art, that Paris is the capital of taste and cultivation, that Paris leads the universe! All men have not taken this super-excellence for granted, however; has not Matthew Arnold said,—

"France, famed in all great arts,—in none supreme"?

Moreover, as we have pointed out, it is actually from a Frenchman that we have the cry of alarm respecting the falling-off of art-products in the "capital of art."

M. Saint-Juirs, in the *Review of the Decorative Arts*, asks one or two trenchant questions. Are the French people really the first artists in the world? What is their absolute and relative art influence? Is their art-power increasing or decreasing? Are they losing or gaining ground? Have they anything to fear from competition? The only manner in which these questions can be answered, says M. Saint-Juirs, is by figures; thereupon he plunges boldly into a perfect wilderness of figures. With regard to the fine arts, figures are easily supplied by glancing at the books of the *Salon*, which is the French equivalent of the Royal Academy show; while with regard to figures respecting art applied to industry, the accounts kept by the Customs authorities furnish all the information necessary. We know that, in the department of Fine Arts, 416 foreign artists exhibited at the *Salon* of 1880, side by side with 1,439 French artists. The fact is significant enough, says M. Saint-Juirs, but is by no means as telling as the result of the inquiry into the state of commerce with regard to industrial art. Nothing could be more instructive and interesting than the figures brought forward by M. Saint-Juirs; and he states very precisely the condition of the industrial art imports and exports in 1859,—that is, before the Free Trade reforms were instituted; and in 1880.

In 1859, France imported manufactured articles (not including food products and raw materials, in which no art is displayed) to the value of 2,464,000*l*. In this total, all that represents drawing, engraving, painting, sculpture, is worth 1,000,510*l*.

In 1880 the French imported manufactured articles to the value of 19,937,880*l*., in which sum artistic articles stand for 5,919,240*l*.! The development of foreign art industry is indisputably felt in these figures, and it is not strange that the French should be alarmed at the decrease in French supremacy.

It would be too long, M. Saint-Juirs observes, to go into all the figures; but he gives a summary of the imports of the principal articles in 1859 and in 1880:—

	1859.	1880.
Chinaware and stoneware	£9,008	£176,560
False stones, enamels, stained glass	17,015	114,998
Wall-paper	23,105	56,810
Books	96,442	176,765
Engravings and lithographs	14,194	253,737
Cut coral	8,757	68,361
Jewelry and gold work	10,840	218,040
Artistic weapons	40,7?2	106,141
Furniture	39,165	189,865
Curiosities for art-collections	81,510	426,164

Tissues are not included in this list: the writer considered that they deserved a special paragraph. His figures respecting tissues concern, of course, the brocaded, embroidered, printed stuffs, and laces,—there is no question of any materials in which art is not employed,—and they show, in spite of the great falling off in two departments, thread lace and Indian cashmere shawls, a considerable increase in importations of tissues. In 1859, the tissues imported were valued at 579,285*l*.; in 1880 the sum had increased to 3,589,218*l*.; and these figures are added to the total imports already mentioned.

To turn to the exportation side of the matter, it will be seen that the total export of French manufactured articles in 1859 was valued at 56,116,000*l*., of which sum, 26,619,400*l*. represented the worth of the artistic products. In 1880 the export of French manufactured articles had reached the figures of 74,034,560*l*., in which sum artistic products were represented by 30,644,920*l*. Therefore, while in 1859 the artistic products figured in the total exports at the rate of 47 per cent., in 1880 they reached only a figure of 41 per cent. of the total exports.

These figures are of the utmost importance, as M. Saint-Juirs points out; they are significant, and should not be disregarded by the Frenchmen who are always ready to cry, after the manner of M. Alfred Assolant, that a Frenchman has nothing to do but to remain in France, a thorough Frenchman, and every honour, every distinction, will come upon him as a mere consequence of his nationality. Frenchmen of this type would be benefited by the sober study of the figures brought forward. Here is the broad fact, undeniable, incontrovertible; in 1859, the French imported artistic wares of all kinds to the value of 1,579,795*l*., and in 1880, the imports had reached the value of 9,508,464*l*. Compared with these figures, the increase of the art-wares exports during the stated years, from 26,619,400*l*. to 30,644,920*l*., seems small indeed. From 1859 to 1880, the exportation of art-wares has, therefore, increased at the rate of 15 per cent., while the importation of art-wares has increased at the rate of 488 per cent.!

The exportation of certain classes of art-products has sensibly diminished. The export of splendid silk materials, the brocaded silks, embroidered and stamped silks and velvets, &c., which were the glory of Lyons, has dwindled to a very low state; linen artistic stuffs have decreased, and the same may be said of art copper-work, cut coral, playing-cards, and china. The startling decrease in the export of china is, however, compensated by the increase in the exports of stone-ware, terra-cotta wares, &c. In many departments there has been, of course, a fair increase. The exports of art-bronzes have nearly doubled, while the exports of sculptured marble have more than doubled. Goldsmith's work and jewelry exports have almost quadrupled; and art-furniture exports have just about doubled.

These figures, gathered together and classified by M. Saint-Juirs, with great ability and impartiality, show indubitably that art industry is progressing at a greater rate in other countries than it is progressing in France, and that a serious competition has been growing up in the lands that the French have been content to consider destitute of art. There are many things to be considered while glancing at this evident discomfiture of French art. Are the imported art-products really works of art? Do they display serious culture, genuine feeling for art? If they do, they undoubtedly constitute a real menace to French supremacy. If, on the other hand, these imported articles are bad as to design and colour, then they must degrade the national taste. The foremost among artistic Frenchmen are inclined to believe that the art-industry of their native country is being lowered, is losing some of the exquisite taste of design and workmanship which has been for years its hall-mark; and they declare that the decadence is due to the urgent need of art schools and special museums, where the young idea may be ably tutored and trained in the way it should go. They demand for France the "vulgarisation of art-teaching,"—to use the expressive term of an enthusiast of some thirteen years ago; and they do their best to remind the French people how at recent exhibitions it was shown that England was on a level with France in the furniture and china departments,—that Austria was on a level with France by reason of her bronzes,—that Italy was on a level with France by reason of her glass ware. Japan is becoming a dangerous competitor, and Belgium and America are making giant strides; and France must make up her mind to give her workmen a complete artistic education, and better opportunities of widening their intelligence and increasing their knowledge. Some Frenchmen assert angrily that France has been despoiled of her native industrial art-workers, who have found homes in other lands. It is quite true that French artists of all descriptions have settled in foreign countries, and notably in England; but it is also true that the points which the intelligent and highly-skilled workmen appreciate in foreign countries, and which they have never as yet enjoyed in their native land, are political liberty and good pay.

THE THAMES AND MILFORD HAVEN: DOCKS IN BOTH HARBOURS.

In our recent notice of the project for the creation of new tidal docks for London, we referred casually to the noblest harbour in the British isles, if not in the whole world,—Milford Haven. The publication of the "admirable scheme for providing deep-water dock accommodation for the port of London," has called forth from the secretary of the Milford Docks Company some remarks to which we are happy, not only to call attention, but to add some emphasis from long and intimate acquaintance with the noble Pembrokeshire harbour.

Milford Haven, Mr. Hood remarks, is 170 miles nearer New York than Liverpool, and 264 nearer than London. Such comparative measurement may be widely extended, and continually to the advantage of Milford. Any one who will take the trouble to turn to the terrestrial globe will see that Milford Haven is, in point of fact, the maritime centre of the world. That is to say, that if we seek the point from which the greatest number of ports can be reached by the shortest voyage, that point is the entrance of Milford Haven. Once out of the narrow channel that admits the sailor within St. Anne's Head, a vessel is well at sea,—is in mid-ocean. As an instance of the convenience of Milford, in days when sailing-vessels played a greater part in commerce than is now the case, we can mention a fact within our own personal knowledge. In 1855 a small cargo of railway materials was despatched from Neyland, near the head of Milford Haven, to Lisbon. The consignees wrote in due course by the day's mail to advise the despatch. The little brig arrived at Lisbon before the letter of advice, aided by the services of railway and steam-packet for the carriage of the mail! For sailing-vessels, indeed, the advantage afforded by Milford, when the wind is in fifteen out of sixteen points of the compass, has been long known to the sailor. Steam-vessels do not so much depend on wind and tide as did sailing-vessels; but the advantage of position in shortening voyages is none the less, and it is one on which the navigator may safely calculate at all times.

On the 15th of the past month, we are glad to learn from the letter of Mr. Hood, the largest caisson ever built was successfully floated across the graving-dock entrance of the new docks at Milford, effectually closing in sixty acres of water. There is not, the secretary to the Milford Docks adds, to his knowledge, "an instance on record of so large an extent of water space being closed in by a single caisson." The caisson is 100 ft. in length, 15 ft. in breadth, and 48 ft. in height. Its weight is 48 tons. The graving-dock is 710 ft. long, 96 ft. wide, with 34 ft. of water on the sill at high water.

By the aid of caissons it can be used by ships up to 700 ft. in length, and can also be used as a lock entrance,—an important feature in view of the size of some of the vessels now being constructed for the American trade.

The Milford Docks will have a water area of thirty acres available for large ships, and quay-berthing accommodation to the extent of 9,840 ft. All the latest appliances for coaling, and for loading and discharging cargoes, will be provided. It should be remembered that the Haven itself forms a natural basin in which the whole navies of the world might safely ride in any weather. There is no place in England in which artificial docks might seem to be so little required; and the fact of their having been now constructed to such an extent, with such facilities for entrance from the harbour, presents an accommodation to commerce such as, we should think, is nowhere else to be found. As far as the outer world is concerned, Milford has the advantage over any port in the United Kingdom, both for position and for unlimited capacity, as well as safety. To this is now added, the convenience of floating basins allowing of easy loading and unloading.

The journey to London by rail can be performed in six hours and a half, and when the Severn tunnel is completed, the distance will be considerably shortened. Direct communication with Manchester, Birmingham, and the Midland counties, as well as with the industrial districts of North Wales, is also commanded by railway.

It is a curious coincidence that on the same day on which Mr. Hood's letter calling attention to Milford Haven was published, there appeared an invitation, to persons concerned in shipping, to inspect the *Great Eastern* steamer, now on sale, and at anchor in Milford Haven. This monster of the deep, in the construction of which the engineer has almost rivalled the mechanism of organic life, has a gross tonnage of 22,500 tons, and a nominal steam-engine power of 2,600 horses. Its cost now stands in the books of the company at 86,000*l.*, and it is said to be in excellent order. Its length between perpendiculars is 680 ft.; its length on deck, 691 ft.; its extreme breadth, 83 ft.; the depth of side, 58 ft.; and its estimated draught when laden, 30 ft. There is a close and melancholy connexion between the *Great Eastern* and Milford Haven. One of the facts that have hitherto militated against the commercial value of the great ship is that it is too large for almost any port. It is certainly too large for the Thames, as regards both convenience and safety. At Milford Haven there is room for a fleet of *Great Easterns*.

The *Great Eastern* was the last and favourite child of the gifted Isambard Kingdom Brunel. The writer of these lines had much intercourse with that great engineer on the subject of this vessel. Mr. Brunel told, in his dry way, how one or two friends called upon him and asked if he thought it possible to build a steamboat 1,000 ft. long. Mr. Brunel replied that he should not like to say how large a vessel he thought might be built, lest he should be thought wild; but that he thought it would be more prudent to try a little one of 700 ft. long to begin with. On that advice the *Great Eastern* was set in hand. It was proposed to Mr. Brunel to build the vessel at Neyland, opposite Pembroke Dock, where a deep "pill," or sheltered creek, forms a natural building-dock. The plan proposed was, to build the keel of the vessel, float it as soon as a couple of plates in height had been put together, and then build the rest afloat. The cost and risk of launching would have been thus avoided. Mr. Brunel pondered for some three weeks, and at last decided on the Thames, exclusively on the ground of the convenience of locality, as he would be able to run down daily from Westminster to see the vessel in progress, while to Milford the journey was formidable. England has had cause to regret this decision, powerful as were the arguments in its favour. It was impossible to launch the *Great Eastern* in the Thames, in the ordinary way, as she would have imbedded herself in the opposite bank of the river. Hence followed the novel and dangerous expedient of the side-way launch, attended not only by mishaps, but by enormous expense, and tending more than anything else that can be suggested to shorten the days of Mr. Brunel. That cost, that mishap, and that anxiety, would all have been avoided if the proposal to build the necessary shops and to undertake the construction of the vessel in Milford Haven had been accepted by the great engineer.

PORTRAITS OF AMERICAN PRESIDENTS.

The deplorable death of President Garfield suggests the memory of the series of portraits of the Presidents of the United States that hang in the Capitol at Washington. It is a noteworthy fact, and one, perhaps, that has not unfrequently been observed, that august personages have not always been fortunate in the manner in which they have been portrayed by painters and sculptors. Of the large number of royal persons that have existed within past centuries, it is difficult to point to many pictures or statues as perfectly faithful or trustworthy representations. Though we possess a curious and almost complete series of our English kings and queens, how many of these portraits are there that we may look upon with thorough faith? How many represent their originals, not from a preconceived and artificial conception of their appearance, but as they really lived? We feel that we may rely on Holbein's portraits of Henry VII. and of Henry VIII.; and the many representations of Queen Elizabeth concord sufficiently to enable us to form some just idea of the Virgin Queen. Van Somers has pictured us James I.,—is it, however, really the pedantic Scotchman Macaulay has so unflatteringly portrayed in one of his literary profiles? On Walker's representation of "Old Noll" we may thoroughly rely for a portrait of Cromwell. Van Dyck, though he flattered his models, has fixed for ever in our minds the Charles I. of history; Lely's powers of accuracy we doubt too much to trust to his version of Charles II.; the eighteenth century was too artificially courtly for us to place our faith in any royal portrait of that age, and it is not till we meet Reynolds that we can venture to rely on any existing portrait of George III.

The American Presidents have been no more exempt from this fate than the crowned heads of the Old World, and of the nineteen Presidents who preceded General Garfield, but one has been portrayed by a painter on whose powers as an artist and as a delineator of nature at the same time we may perfectly rely; we refer to the portrait of General Washington by Gilbert Stuart, and that portrait, curious to say, is unfinished, the head being all that is painted, the rest being what painters call "clean canvas."* Stuart was well aware of the merit of his work, and was wary enough not to complete it, using it as the original from which he copied the innumerable portraits of the founder of the American republic that were at the time distributed over the United States, and which bear Stuart's name. The painter cleverly succeeded in retaining his original portrait, which is now one of the most justly-prized of the rapidly-increasing artistic treasures of Boston. Taken late in Washington's life (in 1794), and representing him at a period when the costume of the courts of Europe was exceedingly elaborate, Washington at his request is dressed in black velvet, with the powdered wig and black "bag" of the period. The truthfulness of the resemblance, even if we had not the authority of contemporaries, would be shown by evidences in the work itself that are unmistakable to the experienced eye, so much so that the amusing story,—one we believe not generally known,—that Washington waited before sitting for his portrait until a new set of teeth arrived from Paris,—is confirmed by the peculiar expression of the mouth which the painter in his truthfulness, perhaps in his humour, made perfectly evident. A more than usual interest is attached to this portrait, not alone on the score of its historic and artistic value, but from the incidents by which both it and the painter are connected with England, and for the facts of which the still-existing traditions,† and the statements of Dunlap, —the Horace Walpole of American art,—are evidence.

It was from his unfinished portrait that Gilbert Stuart painted the large portrait for the Marquis of Lansdowne, from which was engraved at the time James Heath's superb and well-known work. Copyright laws between England and America no more existed in those "good old days" than now, and we can well understand Stuart's feelings at the success of Heath's print, though he jokingly remarked (and Stuart has left behind him the reputation of a wit), with reference to the inaccuracy of the engraver's mention of his name as "Gabriel," "Men will make an angel of me in spite of myself."

Gilbert Stuart, like most of his contemporary brother artists, crossed the Atlantic, and in the days when not a few Americans remained still good Britishers,—Stuart's father was a Scotchman,—found his way to London, and here he remained some years. To West, as might be supposed,—being, like himself, an American,—young Stuart went, and in his studio in quiet Newman-street saw most of the visitors to the favourite painter. There is a story extant that one day Dr. Johnson called on West to gather from him any information he might possess regarding America. West, who had left his native country some years, referred the Doctor to his newly-arrived pupil, young Stuart. After some conversation, Johnson patronisingly asked the witty young American who had so pleased and instructed him, where he had learned such good English; to which Stuart's prompt, if scarcely polite, reply was, that he could better tell where he did *not* learn it,—from the Doctor's Dictionary. Stuart quickly gained a name over here, and from York-buildings, where he had first lodged, he moved to a fine house in Berners-street, Oxford-street, at the very respectable rent for 1782 of 150*l.* a year.* Our National Portrait Gallery contains two portraits by Stuart, —one of Kemble, the other of his old friend and master, Benjamin West.

THE NEW EASTBOURNE AND TUNBRIDGE WELLS RAILWAY.

In the course of the last few years many important new works have been executed by the London, Brighton, and South Coast Railway Company in numerous localities embraced by the company's system. These works have included the erection of many new passenger, goods, and coal stations, and the enlargement and re-arrangement of others, and also the construction of new lines for the accommodation of the growing traffic of the company; one of these, the communication between Chichester and Midhurst, was noticed in a recent number of the *Builder*. The last completed extension of the company's system is the line between Eastbourne and Tunbridge Wells, which is now finished by the completion of the important new station and works at Polegate, near Eastbourne. Another and much larger extension than either of those referred to is rapidly approaching completion in the new lines, upwards of forty miles in all, that will provide, practically, an additional trunk line from Croydon to Lewes, Newhaven, and Hayward's Heath, *viâ* East Grinstead. These extensions in East and West Sussex, and across Surrey and Sussex, are revivals of schemes that were projected, and the works partly executed, many years ago.

Several surveys for a line to connect Eastbourne with Tunbridge Wells were made before the scheme as now carried out received Parliamentary sanction. These were promoted by the Brighton Company, by the South-Eastern Company, and by independent companies. The Surrey and Sussex was resumed after having been abandoned for a time; it was the scheme of an independent company, and was next taken up by the Brighton Company, by whom the works are being executed. East Grinstead will be a principal station on this line, being at the point of intersection of the lines from the Isle of Wight, Portsmouth, Littlehampton, Horsham, and Three Bridges on the west and south-west, and Tunbridge Wells on the east, and the new line from north to south between Croydon and Lewes. Although East Grinstead does not now return, as it once did, two members to Parliament, it is a place of considerable and growing importance. The parish, the largest in Sussex, contains 15,072 acres. It has a population of nearly 10,000, the increase during the last ten years having been 1,185.

The earliest proposals to give Tunbridge Wells the benefit of railway communication excited the hostility of the owners and occupiers of property, who feared that injury would result from

* Resembling in this treatment the well-known portrait in our National Portrait Gallery of William Wilberforce by Sir Thomas Lawrence.

† The writer in 1849 had the opportunity, in America, of frequently meeting the two daughters of Gilbert Stuart, two old ladies whose anecdotes relating to Washington and his period were as famous in America as were the recollections with us of the Misses Berry.

* Mrs. Hoppner, in a letter quoted by Dunlap in his "History of the Arts of Design in America," writes under date June 3, 1782,—"Mr. Stuart has taken a house, I am told, of 150*l.* a year rent, in Berner's-street, and is going to set up as a great man."

facilities for reaching their charming locality quickly, and at moderate cost. With experience of the influence of railways in promoting the comfort, convenience, and prosperity of the inhabitants of the districts they reached, and in increasing the value of real property, opinion changed, and owners of property who had formerly opposed local railways became their strongest supporters. The first line that reached Tunbridge Wells was made with the full consent of all parties interested, was unopposed, and was actually made without even the powers usually conferred by an Act of Parliament.

The desire for railway communication between Eastbourne and Tunbridge Wells existed long before Parliamentary powers were obtained for the construction of the line now completed. We believe that the Duke of Devonshire, to whom the great part of Eastbourne belongs, was prepared to make a line himself, if a company could not be induced to undertake it. The Brighton company took up the project, and have made the line. A portion of the route was already in their hands in the lengths from Polegate to Hailsham, at the southern end, and between Tunbridge Wells and Eridge on the north. To link together these two stations, and to provide continuous communication between Eastbourne and Tunbridge Wells, about 16¾ miles of new line were needed, and have been provided.

On the new portion of the line there are five stations. Polegate and Hailsham had already their stations; at Polegate a new and admirably appointed station has been provided, and the buildings that have hitherto served for the accommodation of the passenger traffic will be converted into a goods station, or put to other uses.

Before referring more particularly to the new line, it may be admissible to state a few facts concerning its termini. The older parts of Eastbourne,—Meads, Southbourne, and Seahouses,—are of great antiquity, their historic traditions, dating much further back than the time when William the Norman and his host landed in Pevensey Bay, close by, before the battle of Hastings. The locality was the site of a Roman settlement, and many interesting Roman remains have been found near the coast at that place. Eastbourne is, however, a comparatively modern creation as a favourite watering-place, and now one of the finest on the coasts of the United Kingdom. Its well-merited popularity may be attributed to a combination of causes, —the grandeur of the coast, the breezy downs, pleasant walks, pure air, mild climate, excellent sea-bathing, efficient sanitary provisions, the number and superior character of its hotels and residences, and last, but not least, the munificence and taste exercised by the Duke of Devonshire in effecting public improvements. In 1801 the population of Eastbourne was 1,668, in 1821 it was 2 607, in 1851 it was 3 403, in 1881 it has reached to 24,333, with 3,821 inhabited houses, the increase in ten years having been 11,356 in population, and 1,573 in inhabited houses; its area is 19,145 statute acres.

Tunbridge Wells, at the northern end of the new line, has had the start of Eastbourne as a fashionable place of resort for those who seek after health and pleasure. It is, excepting Bath, perhaps, the oldest and most charming inland watering-place in the kingdom. So long ago as 1606, it is chronicled, Dudley, Lord North, accidentally discovered the medicinal virtues of the chalybeate springs at Tunbridge, which led to the fame of the place, but its remarkable growth has been since the commencement of the railway era. For long after the days of Lord North, the Wells were treated as an appendage of Tunbridge, and the statistics of the one place were included with those of the other. It may suffice, to show that Tunbridge Wells, like Eastbourne, is a place that grows rapidly, to state that in 1861 its population was 13,807, and in 1881 was 30,352, or considerably more than double. The increase in population in the twenty years has been 16,545; in inhabited houses, called 5,733 by the census of 1881, the increase has been 2,240. The population of Tunbridge town at the last census was only 14,687, or less than half that of Tunbridge Wells.

Eastbourne and Tunbridge Wells have in common a beautiful feature in the interspersion of fine greenery with the buildings; the rows of flourishing trees in the streets and roads of Eastbourne, and the preponderance of private dwellings and residences of professional men and gentry over ordinary places of business, are remarkable. Tunbridge Wells abounds in rich and varied beauties peculiar to itself and the district in which it is situated, notably in its fine commons and picturesque rocks.

Leaving Eastbourne by rail, and looking back upon it, a pretty view is obtained of a considerable part of the town, and of the tops of the long range of Martello towers that stud the coast. Eastward, in the direction of Hastings, an extensive plain affords excellent pasturage for the live stock of various kinds that are so plentifully sprinkled over it. This large area includes the Willingdon and Pevensey levels. Polegate Junction is reached at a few miles' distance from Eastbourne.

The through Brighton lines between east and west pass between long platforms at the station. There are four of these platforms, each 600 ft. long by 30 ft. wide, and for the greater part covered with elegant roofs of glass and iron. The station buildings are an imposing pile. Red and white brickwork does not resist the influence of saline breezes, which discolour and disintegrate frontages built in such material; the Polegate Station buildings are accordingly faced in cement, and the style adopted is Italian. The other station buildings on the new line are Old English, with fronts of red and white brick, the dressings and mullions of the windows being of Portland stone. The roofs of the Polegate Station buildings are covered with slates; those of the other stations with flat red tiles, and finished with terra-cotta finials and ridges. On the ground-floor at the Polegate Station the principal block of building has suitable conveniences at the extreme end of the building; then follow a cloak-room, 15 ft. square; passage for luggage; ticket and telegraph office, 15 ft. by 16 ft.; booking-office, 30 ft. by 16 ft.; waiting-room, 16 ft. by 12 ft.; a ladies' room, lobby, and at the extreme end again, station and house coal-stores. On the platform level, 14 ft. higher than the ground-floor, there are lobby, closets, &c.; ladies' room, 16 ft. by 11 ft.; general waiting-room, 20 ft. by 16 ft.; refreshment-room, 24 ft. 6 in. by 16 ft.; and a kitchen, 16 ft. by 9 ft. There are also provided a station-master's room, 15 ft. by 11 ft.; and a ticket-collectors' room, 13 ft. 6 in. by 11 ft. The station-masters' residence, on the first floor of the station buildings, includes a sitting-room, 18 ft. by 12 ft.; kitchen, 12 ft. square; with three bedrooms of about 12 ft. square each. Station-master's family accommodation is provided at all the stations. The subway for communication between the platforms at Polegate station seems a good piece of work. It is 150 ft. long, 10 ft. wide, and 8 ft. 6 in. high, lined with white enamelled bricks, and well lighted with Hayward's patent lights. There is communication by a double flight of steps between the subway and the central platform, and by single flights with each of side platforms. Provision on a liberal scale is made, or is in progress, for the accommodation of goods, mineral, and cattle traffic. Goods and mineral traffic are provided for at all the stations on the new line, which commences at the thriving market town of Hailsham, population 6,702.

A railway line nearly seventeen miles in length, traversing an undulating country, crossing many roads and streamlets, and that has occupied four years in construction, which is about the time since Mr. Joseph Firbank, the contractor, commenced operations, implies much hard work and clever contrivance, displacement of material in some places, and deposit of material in others. There are fifty distinct cuttings and forty-nine embankments on the line, and seventy-four bridges and culverts. The line crosses the Redmill stream nine times, and also crosses the River Cuckmere, and many smaller streamlets. The summit of the line is near Heathfield, about eight miles from Hailsham, or nearly half-way. It is 384 ft. higher than the level of the line at Horsebridge, the lowest point. The gradients and curves are for the most part easy, and all perfectly practicable. The contour of the country is partly indicated by the fact that on each side from the summit there are rising and falling gradients, and reaches of level. The bridges over and under, culverts, and other engineering works, are not of a character to call for special remark. The station works at Polegate, Mayfield, and other places have a stronger claim for notice. The first new station on the line after leaving Hailsham is at Hellingly, a pretty country town and parish of about 6,700 inhabitants. As may have been already inferred, there is just about the same proportion of the line on embankment as there is in cutting. In almost every instance of the open being reached, beautifully picturesque scenery, sometimes in extensive reaches, presents itself, charming in its variety and gradations of light, shade, and colour. The country is well wooded, but has also many hop-gardens, meadows, and fields under cultivation between the clumps of plantation. Game of various kinds is abundant, good for huntsmen as well as "hoppers," who do not, of course, follow their distinctive pursuits simultaneously.

Horeham-road is the next station. The scenery near this station is very fine, and includes a beautiful view across the valley of the river Cuckmere, which reaches the Channel at Seaford. At Heathfield, and near it, there have been some very heavy works in cuttings and in embankments, and in a tunnel of about eleven chains, cut through very hard rock. Some of the embankments, containing immense masses of earthwork, gave much trouble hereabouts, from spreading out at the base. They seem now thoroughly consolidated. Heathfield Park, near the station, now in the occupation of Lord Claud Hamilton, M.P., was at one time the residence of Lord Heathfield, of Gibraltar renown. When Sussex was celebrated for the iron produced in the county, Heathfield was famous as a cannon foundry. It has one of the largest corn-markets in Sussex.

Mayfield, seen from the line, presents a very pretty picture. The scenery around is very charming, and a succession of fine views is commanded from the line. The archiepiscopal palace is a well-known relic of architectural and antiquarian interest. It was the favourite residence of the Archbishops of Canterbury from the time of St. Dunstan to Cranmer. In 1573, seventeen years after Cranmer's martyrdom, Mayfield Palace was in the occupation of Sir Thomas Gresham, of the famous London citizen and founder of the Royal Exchange, and he in that year fêted Queen Elizabeth at the Palace. It was purchased in 1863 by the Duchess of Leeds, and converted into a convent, under the architectural direction of Mr. Pugin. The fine banqueting-hall is used as the convent chapel. The Mayfield district has many attractions for naturalists as well as antiquaries. We notice that the Brighton and Sussex Natural History Society had a field excursion to Mayfield on the 10th ult. The Mayfield Station is the largest on the new line, excepting Polegate, which is entirely different in external appearance and internal arrangements. The other stations are similar to that at Mayfield, in general appearance and internal arrangements, only somewhat smaller, and have not some of its adornments in the shape of lead-fret glazing and tinted glass.

Rotherfield, from the river Rother, that for part of its course is the boundary between Sussex and Kent, is the last station on the new line, although not the end of the route. In this neighbourhood the line skirts the shoulder of Argus Hill, an eminence of considerable height upon a terrace. Near here also is Crowborough Lodge, the seat of Mr. C. L. Prince. Crowborough Beacon is an eminence 804 ft. high, upon the summit of which is an astronomical observatory.

The line from Lewes joins the new route before entering Eridge station. At a short distance beyond the station a newly-made curve strikes off to the left for Withyham to join there the line from Tunbridge Wells to East Grinstead and numerous other places and junctions; the other curve, to the right, continues the line past Groombridge station to Tunbridge Wells,—the end of the journey.

It is not too much to say that the new line passes continuously through a country that presents a marvellous assemblage of the beauties of nature; among hills and vales, woods and brooks, lawns and rocks and groves, orchards and hop-gardens, scenes that are here "wildly noble," and there,—

> "By shallow rivers, to whose falls,
> Melodious birds sing madrigals."

The principal landowners through whose property the line passes are the Marquis of Abergavenny, Mr. H. Dalby Hunt, representatives of the late Mr. F. A. Schroeder, Mr. W. Tooth, Sir Charles Wm. Blunt, bart., &c.

The line was laid out by Mr. F. D. Banister, engineer-in-chief of the Brighton Company; contractor Mr. Joseph Firbank; signals are by Messrs. Saxby & Farmer; designs for stations by Mr. Myers, of Westminster; station works by Mr. Longley, of East Grinstead. The resident engineer is Mr. S. Paine; contractor's superintendent, Mr. Throsall.

The new line is single, except at stations, where accommodation for traffic in sidings is provided. The slopes of cuttings and embankments are 1½ to 1.

REVIEW OF THE HALF-YEARLY MEETINGS OF THE RAILWAY COMPANIES.

THE METROPOLITAN RE-ASSESSMENT AND THE SURVEYORS.—INTERESTING STATISTICS.—LARGE OUTLAY ON NEW LINES.

THE reports presented at the half-yearly meetings of the several railway companies which have just been held will in many respects be found to be of a specially interesting character. As regards several of the great lines having termini in the metropolis, the invidious position of the surveyors and valuers under the recent re-assessment of property in London formed a prominent subject of discussion and complaint. At the meeting of the *Great Eastern Company*, the chairman, adverting to the question, said that the magistrates themselves had denounced the system of employing gentlemen as valuers and surveyors who were paid by a percentage on the amount of their assessments. In proof of this the chairman quoted the remarks of Mr. Edlin, the Assistant Judge, on a recent appeal at the Middlesex Sessions. On that occasion Mr. Edlin observed that "it was elicited from an eminent surveyor and valuer that, being employed by the overseers, his remuneration depended on the increased amount in the assessment of the rateable value of the property of the parish, as compared with the last valuation list. It was the unanimous opinion of the court that they could not too strongly reprobate such a system of payment. It was calculated to destroy the value of testimony offered in court, and to shake their confidence in any figures brought before them, besides creating dissatisfaction and annoyance in the minds of all ratepayers whose valuations were increased. The only object of parish officers and assessment committees should be to put a just and reasonable valuation upon the property within their district, and any valuation which gave a personal pecuniary interest to the valuer must necessarily be open to grave suspicion." The chairman of the *North London Company* also drew the attention of the shareholders to Mr. Edlin's observations from the bench. The chairman, in continuation, said he admitted that these surveyors ought to be paid handsomely, as they were gentlemen of education and experience, and had a position in society, and he was not desirous of depreciating them or derogating from their services, but what he insisted upon was that if they paid such a body of men on the principle of receiving 5 per cent. on the increased value of the assessment, it was an inducement for them to do what was not quite correct. The subject was likewise alluded to by the chairman of the *Midland Company*, who observed that in the parish of St. Pancras, as they were all aware, the company had a very valuable property, which had been assessed for the last five years at the annual value of 53,700*l*. At the late re-assessment the parish engaged the services of a competent rating surveyor, on the terms of 5 per cent. commission on the increased rateable value he obtained, and acting on his valuation they claimed an assessment of 79,000*l*. The directors, thinking that some increase ought to be made, and anxious to avoid litigation, offered to settle an assessment of 60,000*l*., but this was declined, and the Assessment Committee, when appealed to, supported their own surveyor. The case was ultimately referred to Mr. Pownall, an arbitrator of very large experience, who reported to the Court of Assessment Sessions that the fair rateable value was 58,289*l*., which the Court confirmed, awarding to the Midland Company the costs of the appeal and arbitration.

From the general proceedings at the meeting of the *Midland Company*, it appeared that during the half-year there had been an increase in coaching traffic of 15,955*l*., and from minerals 74,690*l*., and a decrease in merchandise traffic of 37,996*l*, and in cattle 6,110*l*., the net increase being 46,539*l*. The number of first-class passengers carried had been 954,323, or 15,138 less than last year, and the number of third-class passengers 11,818,749, or 214,341 more than last year. The total capital expenditure during the half-year on lines open for traffic and on lines and works in course of construction had been 702,822*l*., and the estimated capital expenditure for the current half-year was 950,000*l*., and for future half-years 3,734,784*l*. As to the Poplar goods station and dock, it was stated that the river-wall and dock are now finished, and that the gates being completed, the water can be let into the dock, and the coffer-dam removed. The sidings were being laid for the yard and branch. The large warehouse was built up to the second-floor level, and the smaller one up to the first floor. Buildings for the hydraulic machinery had likewise been commenced. The works at the Tottenham and Hampstead north curve had been commenced, and the retaining-wall of the junction with the main line, together with the covered ways, and the cutting near the Brecknock-road, were in progress. It was stated at the meeting that the growth of the traffic in and out of London had rendered essential a second tunnel between Haverstock-hill and Finchley-road. A contract was entered into in March last for the construction of the tunnel. The works had been commenced, and the shafts were all in a forward state, which would enable the contractors to proceed with the tunnel immediately. In the course of the meeting the chairman alluded to the question of brakes, the introduction of which is now being insisted upon by the Board of Trade. He stated that the company had at present 57 engines and 209 vehicles fitted with the Westinghouse automatic air-pressure brake appliances; 202 engines and 2,074 vehicles fitted with the Saunders and Bolitho automatic vacuum brake appliances, of which 80 engines and 809 vehicles were fitted in the last half-year. They had likewise 26 engines and 115 vehicles fitted with Smith's vacuum brake, and they had 2 engines and 11 vehicles fitted with Barker's brake.

The report of the *Great Western Company* stated that there was an increase in the traffic receipts as compared with those of the corresponding half-year of 1880, of 49,042*l*., passenger traffic, merchandise, and minerals having all partaken of the increase. The dividend declared was at the rate of 4½ per cent. per annum. The progress of the Severn Tunnel formed a prominent feature in the report, which stated that during the past five months about 270 ft. of the permanent tunnel under the Severn had been completed, and a total length of 530 ft. of the arch of the tunnel had been formed under that part of the river known as the Salmon Pool, to the westward of the sea-wall shaft. In answer to a question by Sir Charles Whetham as to whether they were tunnelling under the land or the water, the chairman replied that they had tunnelled under the most difficult part of the water, and that a most difficult part was accomplished, which was called the Salmon Pool, on the English side of the Severn. The tunnel was roofed in there and completed, and it was the only portion where they really had any anxiety. At the meeting a vote of 60,000*l*. was granted for the following works now in progress:—Doubling the Wilts, Somerset, and Weymouth line between Waltham and Maiden Newton, 14,000*l*.; new offices at Paddington and enlargement of the station, 20,000*l*.; Plymouth Docks, additional accommodation, 8,000*l*.; Swansea East Dock coal-tips, 15,000*l*.; and new passenger station at Tilehurst, 3,000*l*.

The *Great Northern Company's* report showed that the gross traffic receipts of the company during the half-year amounted to 1,541,179*l*., as compared with 1,514,465*l*. in the corresponding period of 1880. The traffic for the half-year, the report observed, had been well sustained, though during the serious interruption caused by the severe winter, in January and February last, there was a large falling off in the receipts, and at the same time a considerable increase in the working cost. In the course of his remarks at the meeting, the chairman drew attention to the continued decrease in the number of first-class passengers, and the increase of third-class passengers, observing that there had been a decrease in the first-class of 6,187 in numbers, and a decrease in money of 6,172*l*. There had been an increase in the second-class of 49,402 passengers, but a decrease in money of 4,227*l*., which was accounted for by the short distances. The majority of the second-class passengers had travelled in the suburban districts, where the distances were very short and the fares very small. There had been an increase in the third-class of 442,945 passengers, and an increase in money of 5,905*l*. The percentage of first-class passengers was on the whole decreasing, and was now only 4½ per cent. The second-class was stationary, and remained at 10 per cent. The third-class was still increasing, and now amounted to 85½ per cent. The capital expenditure on lines open, and on new lines and works, during the half-year, had been 540,011*l*.; and 77,211*l*. was required to be expended during the current half-year in additional works for the accommodation of the traffic. The most important items were new platforms, sidings, and stables, the London goods station, and the extension of the passenger station at Nottingham. The accident at the Sutton Bridge Docks, in which the company is largely interested, was referred to by the chairman, who said it was a great disappointment to the directors that the catastrophe had occurred. The docks were hardly finished, and vessels had only just begun to enter the basins and discharge their cargoes or export coal, when the calamity occurred, which they must attribute to the treacherous nature of the soil of the place. A leakage took place under the locks and led to the damage which took place. The company had subscribed 55,000*l*. towards the undertaking, and they had two of the Board representing the company on the Dock Board. They had hardly made up their minds what was to be done regarding the docks. They had a report from several eminent engineers, and they knew pretty well what they recommended, but to carry out their recommendations would entail considerable expense, and at that moment the dock company had no money to expend. On the motion of the chairman, the railway company were empowered to take such steps as they might consider necessary to secure the company's interest in connexion with the docks, and to expend any sum that might be deemed requisite to protect the docks from further injury.

In the *Builder* lately (p. 290, *ante*), the proceedings at the meeting of the *London and North-Western* Company, relating to railway taxation, the falling off in the Irish traffic, the Employers' Liability Act, and some other matters, were noticed. The chairman, in his speech moving the adoption of the report, made some interesting remarks on the new works which had for some time past been in progress on various parts of the company's system, and also drew the attention of the shareholders to the additional expenditure which it is proposed to incur on further new lines and other works. Adverting to the former, he said that the London-road Station at Manchester was now very greatly enlarged, as well as the Lime-street Station at Liverpool. If any one, he observed, would go to Manchester, he would say that the wonder was that they could have gone on with the former station at all. But it was now different. They had also opened for goods the duplicate station at Northampton; and by January he hoped Northampton would have its passenger-station ready, and thus bring in the North-Western line. He did not believe it was the intention of Stephenson to go through Northampton; there was a tradition, too, that the people of Northampton objected to it. He could not have got the line with the present gradients. They had now other advantages by the new line which would go through Northampton. They had put that line on the old main line through Rugby, and on the new main line to Nottingham and the North. The company had now a double line all the way from London to Birmingham, a double road to Northampton, a double road to Crewe, and through to Liverpool, and with the assistance of the North Staffordshire Company, they had two roads to Manchester, and two to Chester, and shorter than any one else. The directors were authorised to expend, in conjunction with the Midland Company, the sum of 820,630*l*. on new lines, including the Market Harborough line; and also 50,000*l*. in the construction of additional lines and sorting sidings at Edge Hill, Liverpool; 35,000*l*. for sidings and improvements at Patricroft, Manchester; 22,000*l*. for sidings at Wolverton; 83,283*l*. for additional sidings and other accommodation; 114,756*l*. for additional land and minerals; 50,000*l*. for additional rolling stock; and 65,000*l*. under the Watford and Rickmansworth Railway Transfer Act,—total, 305,039*l*., being an aggregate expenditure (including the joint expenditure with the Midland Company) of 1,125,669*l*.

The *Great Eastern Company's* report stated that the accounts showed a gross revenue from all sources of 1,424,291*l*., against a gross revenue of 1,398,079*l*. in the corresponding half-year of 1880. The passenger and goods traffic had suffered from the closing of the cattle markets; whilst the severe winter and heavy falls of snow occasioned a considerable increase in the expenditure of the various departments, the

working expenses showing a gross increase of 20,762*l.* Satisfactory progress had been made with the works on the Northern Extension, and the directors hoped that the portion from Spalding to Sleaford would be opened during the present year. Adverting to the enlargement of the Fenchurch-street Station, the chairman said he hoped it would be completed before this time next year. They would then be enabled to get in and out a greater number of trains, and to further accommodate the suburban districts which they supplied. He added that they were about to widen the line from Stratford very nearly to Bethnal-green, by making four lines of rails.

At the meeting of the *London and South-Western Company* the chairman stated that the company had suffered from the great snow-storm and the severe winter, which was felt more severely in the southern and western districts than in the east and north. The severe winter had cost the company 31,000*l.*, and if the directors had had that amount of money to dispose of they would have been able to carry over the same balance as they did in the corresponding period, and to pay the same dividend. There had been a decrease in the revenue during the half-year of 3,025*l.*, and an increase of 28,823*l.* in the expenditure. The dividend declared was at the rate of 4¾ per cent. It was stated that the widening of the line between Clapham Junction and Surbiton would probably be finished in the course of the year, and the line from Surbiton to Hampton Court Junction would take about two years. The new line between Surbiton and Guildford would be shortly commenced. The chairman stated that the important subject of extending the line from Waterloo into the City was receiving careful consideration by the directors, who were making all necessary inquiries with a view to the decision of the question in the interests of the shareholders.

The report of the *London, Chatham, and Dover Company* stated that the gross receipts for the half-year amounted to 530,156*l.*, as compared with 523,583*l.* for the corresponding period of 1880, being an increase of 6,574*l.* The report also stated that the Board proposed to proceed as rapidly as possible with the several new works authorised by the Act of the late session. They include the new bridge over the Thames and the station opposite the *Times* office; the Maidstone and Faversham Junction Railway; a junction to connect the Dover and Deal line with the main line; and two extensions at Greenwich and Sheerness. The works are to be proceeded with in the order of their urgency, the extension at Blackfriars and bridge across the Thames being the first.

At the meeting of the *South-Eastern Company* the chairman stated that the results of the traffic during the half-year had not been satisfactory to his mind. They had received practically 16,295*l.* more money from one source or another, and managed to spend 20,630*l.* to get it. He found that during the last desperate winter they spent 2,168*l.* in clearing away the snow, and they sustained a loss of nearly 10,000*l.* in traffic. As regards the company's new works, it was stated that the West Wickham and Hayes and Hundred of Hoo lines, including the deep-water harbour on the Medway, were making satisfactory progress; the contract for the Woodside and Croydon line had been taken by Mr. Joseph Firbank; and the extension of the North Kent line from Strood to Chatham and the construction of a line from Northfleet to Snodland would shortly be commenced. The chairman announced that the Charing-cross Hotel had now been fully purchased from the hotel company by the railway company.

The report of the *London, Brighton, and South Coast Company* stated that the receipts from traffic for the half-year amounted to 931,222*l.*, as compared with 927,085*l.* in the corresponding period of 1880, showing an increase of 4,137*l.* The Tunbridge Wells and Eastbourne, the Ryde Pier and Railway, and the Chichester and Midhurst lines, had just been opened, and progress was being made with the Lewis and East Grinstead line, the Croxten and Oxted line, and the Newhaven Harbour. Regarding the last-named undertaking the chairman remarked that no doubt they were throwing their bread upon the waters in the hope that it might come back to them another day, and he believed it would. He looked forward to the time when the deep-sea harbour at Newhaven would give them a great deal of continental traffic in different directions.

The traffic receipts on the *North-Eastern line* for the half-year amounted to 3,079,161*l.*, as against 3,115,965*l.* last year, being a slight decrease, but admitting, after expenditure, of a dividend on North Eastern Consols and the New Stock at the rate of 7½ per cent. per annum. Referring to the traffic in the different classes of carriages, the chairman said that they carried 415,000 first-class passengers, as against 453,000 in 1880. The second-class passenger traffic also showed a continuous decrease. In the last half-year they carried 529,000, against 600,000 in 1880, and 643,000 in 1879. But the third-class traffic continued to increase. There was a steady and regular augmentation of third-class passengers, of whom they carried in the past half-year 12,756,000, as compared with 12,193,000 in 1880, the increase being 563,000, and an increase of no less than a million and a half over 1879. That showed that there was a tendency to travel in a cheaper class of carriage, and, therefore, they had made a considerable reduction in both first and second class fares. They were largely converting first-class into third-class carriages.

The proceedings at the meetings of the *Metropolitan* and *Metropolitan District Companies* were chiefly interesting so far as they referred to the prospect of the early completion of the Inner Circle.

The report of the *North London Company* stated that, notwithstanding the interference with the traffic arising out of the severe weather in the months of January and February last, the receipts of the last half-year showed an increase from all sources of traffic, admitting of a dividend at the rate of 7½ per cent. per annum on the ordinary stock.

The *Lancashire and Yorkshire Company's* report showed the traffic receipts for the half-year to be 1,741,841*l.*, against 1,717,700*l.* in 1880, and a dividend at the rate of 4¼ per cent. per annum was recommended. The amount of capital expended during the half-year was 306,353*l.* and 290,735*l.* would be required for expenditure on new works during the current half-year. The property required for the new Exchange Station in Liverpool had, for the most part, been obtained, and the work would before long be commenced.

It appeared from the proceedings at the meeting of the *North Staffordshire Company* that the line suffered greatly during the winter time from floods. The chairman stated that the Churnet ran down a part of their railway, the Dove ran down another part of the line, and the Trent also ran down another part; so that they were subject to floods from three different sources. These floods were very disastrous, and washed away the ballast on their line, and injured their bridges, rendering necessary a large expenditure in repairs and other works.

A BRIEF CHRONICLE OF NEWGATE.

The prison of Newgate is doomed. Probably before the present year draws to a close the work of its destruction will be commenced.

"B. L., of Twickenham," in "An Accurate Description of Newgate" (London, 1724), writes:—"Newgate, the county gaol of Middlesex, is situated in an elegant part of the west of the city of London, called Newgate-street. This prison was built either in the time of Henry I. or that of King Stephen, but in which there is no certainty; and was then (as it has ever since continued to be) a prison for debtors, felons, &c. About 300 years after the first founding of the prison, it became terribly loathsome; and, therefore, was in the year 1412, rebuilt by the executors of Sir Richard Whittington, in the reign of Henry VI. The architecture of this structure is of the Tuscan order, magnificently built with stone, with great strength and beauty." It was repaired in 1630, and in 1672, after being nearly destroyed in the Great Fire. It received its name from the circumstance of the rooms in the postern over the new or latest built gate of the city being used for the detention of prisoners. In "A History of the Press Yard" (London, 1717), which was one of the three divisions of the prison, the author, who was incarcerated along with certain of the Scottish Rebels in 1715–16, writes:—"This tomb of the living (the Press-yard) was once the Phœnix Inn, by Newgate-street, and being contiguous to the gaol of that name, and very convenient for enlarging the territories of one of its keepers, of tyrannical memory, was added to it in the times of the Usurpation." The gaol was burnt by the rioters in 1780, before the completion of the present building, which was designed by Dance, the architect of the Mansion House, and finished in 1783.

The walls of Newgate during the last 600 years have inclosed a motley multitude of prisoners, famous and infamous. In 1241 several rich Jews were ordered to pay 20,000 marks or to be kept perpetual prisoners in Newgate, and shortly afterwards King Henry sent the sheriffs to the Tower, and fined the City 3,000 marks, for allowing a priest who had killed a prior, a cousin of the queen, to escape from Newgate. In 1457, Lord Egremond, Sir Thomas Percy, and Sir Richard Percy, were committed to Newgate for a fray in the north country with the Earl of Salisbury's sons. The cells of Newgate opened their doors to many of the Puritans. At the Restoration, George Wither, poet and pamphleteer, and George Sackville, poet, *roué*, and Earl of Dorset, occupied cells in Newgate. William Penn, the founder of Pennsylvania, was committed to Newgate for six months for street preaching in 1622; and, in 1703, Daniel Defoe, for having written his treatise "The Shortest Way with Dissenters," was fined, pilloried, and committed to Newgate. It is not necessary to make any selection from the list of criminal offenders of the Jack Sheppard and Jonathan Wild, the Greenacre and Daniel Good class, for mention here.

Geoffrey Chaucer, the poet, is said at one time of his City life to have resided in Newgate, but not as a prisoner. In a black-letter pamphlet entitled "The Discovery of a London Monster, called the Black Dog of Newgate, imprinted at London by G. Eld for Robert Wilson, and to be sold at his shoppe at the new gate of Graye's Inne, 1612," is a representation of one side of the postern of Newgate, a tower with a grated door leading to grated chambers above, from one of which a disconsolate prisoner is gazing through the bars. This rough cut agrees in the main with some of the oldest extant representations of the ancient gate, the "fifth principal," as Stow terms it, in the City wall.

ROADS AND RUIN.

The road question in London is becoming very serious,—more serious than it ever has been. The adoption at one time of Macadam, then of asphalte, and now of wood, and the failure of all in certain instances, have led, and are leading, to constant stoppages of traffic and dire mischief to individuals living in the line of operations. The rapidity with which roads now get out of order is very striking, and the increased length of time during which the traffic is turned in order to do the work is equally obvious. A portion of Piccadilly, for example, between Duke-street and Regent-street, has been blocked up for many weeks, to the inconvenience and great loss of some of the shopkeepers,—a loss, in one case, we are told, likely even to prove disastrous. In other parts of the town we hear of the greatest indifference being shown to the complaints of parties inconvenienced and injured, and that twice the time has been occupied over a work that it should have needed. In the Fulham-road there seems to have been great delay, and one end of Brompton-crescent opening into it has been turned into a stone-yard or depôt for materials for an unnecessarily long period of time. We have in our eye the case of a physician there, to whose house no carriage has been able to approach for many weeks, notwithstanding repeated requests that materials placed there should be removed. We should be surprised, were he to bring an action against Messrs. Nowell & Robson, the contractors for the work, and show the positive injury that has been done, if he did not recover substantial damages.

Under the best arrangements individuals must suffer during the stoppages now so constantly taking place in the highways. It should be the bounden duty of the parish authorities and contractors to minimise this evil to the utmost.

Lightning.—The church of South Wootton, near Lynn, has been struck by lightning. The damage done is serious. The electric fluid struck the tower, splitting it almost in two, and leaving it uncertain whether one portion will not fall and so bring down the rest with it. Then, running along the lead ridge for some dozen yards, it entered through the roof into the nave, where it spread havoc in all directions. Was the church protected by a conductor?

THE "GRESHAM PRESS" NEW BUILDINGS.

The spacious plot of land, bounded on the west by the London, Chatham, and Dover Railway station, in New Bridge-street, and on the north by the buildings on the south side of Ludgate-hill, has recently come into the possession of Messrs. Unwin Brothers, and upon a portion of it they have just erected an extensive printing factory, which will shortly be ready for occupation. The principal elevation is on the north side, fronting the narrow thoroughfare known as Little Bridge-street, which runs in an eastward direction from New Bridge-street through a corner passage or neck not more than from 3 ft. to 4 ft. in width, and thence, intersecting Broadway, is continued along Pilgrim-street and into Ludgate-hill. The Corporation having secured about 10 ft. in width of the land in front of the new buildings, the Little Bridge-street frontage has been set back to that extent, which admits of the present narrow roadway being correspondingly widened. The intention of the Corporation is to open out an uninterrupted thoroughfare for vehicles into Ludgate-hill by way of Pilgrim-street.

The site upon which the new buildings have been erected has an area of about 9,200 superficial feet. The Little Bridge-street frontage, and also that in Railway-street, on the west side, facing the east side or rear of the railway station, are each 90 ft. in length, and 80 ft. in height, the chimney-shaft being carried to a height of 90 ft. In addition to a deep basement and ground floor, the building has four lofty stories. The ground-floor frontage facing Little Bridge-street consists of shops, which the owners intend to let for general business purposes, in anticipation of the opening out of the new thoroughfare already referred to. The shop frontages are carried up with Bath stone columns and pilasters, surmounted by carved capitals. The upper stories are in stock brick, with red brick for dressings and ornamentation in the Queen Anne style. The east end of the frontage is surmounted by a large gable. One of the most ornamental features of the building is the angular elevation at the corner of Little Bridge-street and Railway-street, where is the principal entrance to the premises. The whole of the lower part of this elevation is in stone, with arched entrance flanked on each side with piers and columns in Portland stone. Immediately above the doorway is an oriel window in five divisions, with carving at the base, and the inscription in prominent characters, "Gresham Press." In the centre of the building, enclosed by the respective frontages, there is a large open area for the purpose of affording additional light to the rooms and apartments on the several floors, and also for lighting the basement in which the machinery will be placed. The walls of this open area, as well as the walls of the basement, are faced with white glazed brick, and the basement is covered in with a flat glass roof or skylight, 40 ft. by 20 ft. At the top of the building there is a water-tank, capable of containing 5,000 gallons.

Mr. Rowland Plumbe, of Fitzroy-square, is the architect, and Messrs. Ashby Brothers are the contractors.

FROM GERMANY.

In celebration of the fiftieth anniversary of the Saxon Constitution, the Albrechtsburg at Meissen has been restored, with a due regard to its historic position as one of the ancestral castles of the present royal family. The work of decoration began in 1874, and in the previous year the Chamber of Deputies had voted 25,000*l.* for the restoration. The subjects of the decorations are for the most part taken from the early history of Saxony, and are in part illustrative of the building of the castle in 930. The edifice has two vaulted stories underground, and three above ground. The attention of the decorative artists has mainly been given to the first and second floors, but the third has also been suitably treated, and the ground-floor has been arranged for habitation. The armoury (which is a richly-designed piece of architecture) has been ornamented with representations of seven of the oldest Saxon and Thuringian castles. The tower, and some subsidiary buildings connected with the castle, have likewise been restored. The statue of Albrecht (the founder), cast in bronze, forms a prominent object of interest. The building was open to public inspection during the work, and last year was visited by more than 20,000 persons. A costume festival will shortly be given in the castle by a number of artistic inhabitants of Dresden.

The municipal chamber at Hamburg has lately received an important addition to its artistic ornament, in the shape of stained-glass windows, the execution of which (by local artists) seems to have given much satisfaction. The subjects represented are connected with the development of the freedom of Hamburg. The solemn and subdued effect produced by the stained glass is much approved by the press.

A vessel, described as the largest yet built in Germany for the mercantile navy, has just been launched at Kiel. It is a screw-steamer, 315 ft. in length and 37 ft. 9 in. in breadth, with a carrying capacity of 3,300 tons, and with accommodation for over 700 passengers. It has been named the *Cassius*, and will, as soon as the machinery is completed, be put on the New York line.

The *Baugewerbe Zeitung* of Berlin calls attention to the fact that speculation has brought building sites in that city to such a range of values that it is impossible to reckon upon a clear four per cent. interest for the builders, even if the cheapest materials and labour are used. It recommends caution to all employed in the selection of building sites; predicting that this movement will before long be followed by a reaction, which will remedy the exceptionally disadvantageous circumstances referred to.

A deputation from the marble industry of Cologne has waited on the German Government with a view to soliciting the abrogation of the import duty (equal to 1s. 6d. per cwt.) on sawn marble slabs, which is now being levied. The trade is not so much opposed to the imposition of the duty in itself, but to its unequal working, as the duty on marble goods, being about the same, an important development of imports has taken place, to the detriment of native industry. The Government lately asked for the opinion of some members of the marble trade, but the authorities are accused of having addressed themselves only to persons known to be in favour of the new tariff.

The Municipal Lighting Committee of Berlin has called attention to the comparatively-limited consumption of gas in that city, which the report attributes to the continued unfavourable position of business in general. The increased use of petroleum is said also to have contributed to this result; and as many as 11,000 gas communications are said to be unused at present, which would represent about one-fifth of the communications for dwelling-houses in Berlin.

THE OPEN AREA OF THE ROYAL EXCHANGE.

Our attention has been called by several correspondents to a design for covering in the Merchants' Area of the Royal Exchange, now being exhibited in the Area, of course with the sanction of the Gresham Committee. We do not know exactly the position of affairs, but we cannot avoid expressing an earnest hope that no intention exists to carry out this design. It is wonderfully ugly, unsuitable, oppressive, and altogether objectionable.

Some time ago the committee invited designs for effecting this object, and the first premium was then given to a design by Mr. F. Sang. We happen to have a small photograph of this before us, and have no hesitation in saying that it is immeasurably superior in appearance to the design now placed before the public. It is to be hoped that watchful eyes will be kept upon the matter.

Bedstone.—The workmen, 130 in number, employed by Messrs. W. Cubitt & Co. in the erection of the new mansion at Bedstone, for Sir H. W. Ripley, bart., have been entertained by him at a substantial dinner, Mr. W. C. Carter, the managing foreman, in the chair, and Mr. Marton in the vice-chair. It was stated in the course of the proceedings that the founder of the feast (who was present) had for the past twenty-five years spent from 25,000*l.* to 30,000*l.* annually in buildings. Mr. Old, the clerk of works, responded to the toast of "The Architect" (Mr. Harris), and proposed health and prosperity to the firm of Cubitt & Co., saying that if all contractors did their work as well as Messrs. Cubitt, there would be less vigilance necessary on the part of clerks of works.

ENGLISH RESIDENCE, ARCACHON, FRANCE.

A HOUSE ON THE SAND.

Arcachon, as many of our readers know, is a small town in the pine forest thirty-five miles south-west of Bordeaux, on a little inland sea called the "Bassin d'Arcachon," an offshoot of the Bay of Biscay, where a great many English reside during the winter months. This is the first English villa erected there, and is built on the sand in the midst of the pine-trees which extend from Bordeaux to Bayonne, a distance of 100 miles. It may be added that in this sand (which, in some places, is 100 ft. deep) they had to excavate several mètres before securing a sound foundation for footings. This difficulty being overcome, the walls were then carried up battered on the outside from a mètre thick at footings to thirty-five centimètres (1 ft. 2 in.) at plinth level, and then proceeded with in the ordinary way. In some places retaining walls were necessary to keep up the sand, the pressure being very great, especially after rain, when it is apt to slip a little.

The sand is fine and light coloured, rendering it useful for building purposes, and that which was excavated was used for the mortar. The house is built of red brick (*brique de Nercam*) with a white flat joint, and white stone dressings (*pierre de Nersac*) with black pointing, that below the plinth being random work, also pointed in black.

The roof is of slate, and made to overhang some 5 ft. in order to shade the house from the sun, which has great power there. Great care has been taken in carrying out Messrs. Drysdale and S. W. Hayward's Patent System of Warming and Ventilating, but owing to the plan being of an irregular shape, it was a somewhat difficult task to procure a straight and convenient passage for the foul-air flue, so as to render it easy of access at any time for repairs, if necessary.

The architect was Mr. George Fred. Haines, of Boscombe-road, Shepherd's-bush. The works were executed by M. Blavey, contractor, and M. Martin, carpenter, of Arcachon, a great many things being provided by English firms: Messrs. Steel & Garland, Sheffield, providing the grates; Messrs. Minton Hollins and Messrs. Maw & Co. providing tiles for the grate cheeks, hearths, &c.; Mr. Geo. Jennings's patent w.c. apparatus being used, and wooden sinks for scullery and butler's pantry, with hot and cold service laid on throughout the house. Credit is due to Mr. H. J. Ellison, builder, Bournemouth, by whom the pine doors and windows were worked and fixed, as also the oak chimney-pieces from the designs of the architect.

A VICTORY OVER SEWER GAS.

Sir,—1. For more than seven years I have been watching the progress made in house sanitation, and I have passed through many experiences. I will not give those at Birmingham and Manchester, where the local administration is prompt and effective, or at Hampstead, but confine my observations to Philbeach Gardens, near Earls-court, where, influenced by the excellent and very advanced sanitary arrangements which have been matured, I have bought a house. I send you plans of them,* and will relate by what steps of evolution the success has been obtained.

2. On the 30th of June, 1880, I took No. 106, Philbeach Gardens, S.W., on a short lease, on trial, of Mr. Mineard, the builder, on the condition that there should be no escape of sewer gas into the house. The house was like others built on the estate some three or four years ago, with a syphon trap under the coal-cellar, and the soil-pipe continued open up to the roof.

3. At this time Mr. Mineard was building other houses on the estate, in which he had introduced an intercepting-chamber between the main sewer and the house drainage, as well as a ventilating-channel at the adjacent wall. Accordingly, the first thing Mr. Mineard did was to fit up my house similarly to others he was then building, with an intercepting and inspection-chamber, and with an inlet for fresh air through one of Boyle's ventilators in the front area. I found Mr. Mineard unusually interested in the progress of house sanitation, and well acquainted with what his brother builders were doing, and

* The details on Plate 2 are drawn rather less than one-fifth of full size.

the many systems which sanitary surveyors were recommending. I was by no means perfectly satisfied that traps of any kind could be relied upon as absolute preventives, and I objected to using the stack or soil-pipe for upward ventilation, which is commonly done, and was done in my house. I urged the necessity of an independent upward draught, which I had insisted upon having introduced into my last residence at Hampstead.

4. Mr. Mineard himself admitted that the best systems then in use were not, in his opinion, satisfactory, but contended that it would not do for a builder to be endeavouring to excel in sanitary work; because whatever he might accomplish in that direction was likely to be much criticised, and, perhaps, unfavourably, by the self-styled sanitary engineers, who might happen to be called in to report on his houses, especially if it differed at all from the engineers' own pet plan. He expressed an opinion that he could do something better than anything then in use, and asked me to allow experiments to be made on my house, to which I cheerfully consented.

5. He proceeded to close up the inlet ventilator to the intercepting-chamber, and connected therewith instead an outlet ventilating shaft of wrought iron, carried above the roof of the house, with a small heating-chamber about 5 ft. above level of area, trying experiments with gas and various kinds of burners, atmospheric and otherwise, and his success from the first was complete. More gas at first was used than was necessary. The results now prove that about 2 ft. consumption of gas per hour is ample to draw down the air which passes down the soil-pipe, then through house-drains and up the extracting shaft.

6. The gas was first applied to No. 106, Philbeach-gardens, in the early part of February, 1881, and Mr. Mineard took out his patent on the 15th of April, 1881.

7. While I write this, the following facts have been registered at the south aspect of my present house, 96, Philbeach-gardens:—

1st. With both w.c.'s closed, the length of pipe from inlet on top of soil-pipe to top of extracting shaft is about 160 ft., and the air passes through the anemometer at the rate of 384 ft. per minute.

2nd. When the upper w.c. is open, which, acting as inlet to soil-pipe, reduces the length of pipe to 140 ft., air passes through at the rate of 422 ft. per minute.

3rd. When the lower w.c. is open, reducing length of pipe to 115 ft., air passes through at 440 ft. per minute.

8. These facts were obtained on 16th September, 1881, at 3 to 3.30 p.m. The day was fine, little air stirring. The sun shone on the front of the house and helped the extraction.

9. The simple effect of these arrangements, which can be demonstrated to any one, has been to produce an *upward* draught so potent that the *downward* draught in all parts of it extinguished a lighted match; and so the problem of giving absolute security against the possibility of sewer gas entering a house was thus solved.

10. The cost of the gas I estimate to be about 1s. per week, which I consider a cheap insurance against typhoid fever.

11. Whilst the work described in No. 106 was going on, Mr. Mineard was erecting further houses ten doors off. These, in general arrangement, were greatly improved. The highest authority on practical sanitation said my present house was "the largest on the smallest space he had ever seen." Upon Mr. Mineard agreeing to introduce some suggestions which I made, I bought one of them, No. 96, and I now invite my friends to come and see it, and criticise it. It exhibits:—

I. Plenty of light—an antidote to dirt and slattishness.

II. Good ventilation generally, and special means for preventing the usual escape of kitchen odours in the passages of London houses.

III. Absolute extraction of all sewer gases and smells by Mineard's patented sanitary arrangements.

IV. Security against frozen water-pipes and water in cisterns.

V. Heating in passage at no cost for working.

VI. A labour-saving lift from kitchen which also insures hot viands and plates.

12. Mr. Mineard has reaped his reward for his intelligent attention to sanitary science, and the practical application of it. He sells his houses with these sanitary features at increased profit before the houses are completed; and since the first experiment was made, has introduced them into all the houses he has built, and is now building.

13. His patent for the application of this system of extracting sewer-gas covers, also, any method of heating, and I have no doubt he will devise a means of cheapening the heating.

14. The result he has now arrived at, by slow but progressive and sure steps, has been the work of four years; and I believe he is only at the threshold of further successes, and that his system will be found applicable at little cost to houses smaller than the one I live in. The plans sufficiently explain themselves without further observations. HENRY COLE.

PRINCIPAL FAÇADE, CADIZ CATHEDRAL.

IT would be in vain to search in the comparatively modern edifice of Cadiz Cathedral for records of the great traditions impressed upon the Gothic pillars of other churches of Spain. The written history of Cadiz Cathedral can scarcely be traced; but, in its place, the building itself is valuable as an artistic work, and a silent testimony to the religious fervour of the people and to the perseverance of Bishop Don Fr. Domingo de Silos Moreno, whose statue, in bronze, was erected in the cathedral square by the municipality in 1856. The foundation-stone of the church was laid on May 3, 1722, during the episcopacy of Don Lorenzo Armengual de la Motá; and the work was commenced under the direction, and according to the plans, of the architect, Don Vicente Acero. Want of funds, however, caused the work to be stopped, and for almost a century nothing was done, the completed portion in the meantime greatly deteriorating. In 1832, when a fire broke out amongst the timber stored in one of the chapels, Silos Morenzo, the bishop at that time, succeeded in stirring up public feeling in the matter, and mainly by his exertions the building was completed, so that he had the satisfaction of consecrating it on November 28, 1838. The sums spent in the construction of the cathedral up to that time amounted to twenty-six million reales.

The interior of the church consists of nave, aisles, and fourteen chapels, and is richly decorated with marble and jasper. The nave measures 279 ft. in length and 44 ft. 6 in. in width; the aisles are 25 ft. wide. Its greatest height, from the pavement to the roof, is 173 ft. The façade has an elevation of 68 ft. 6 in., and has three entrances. It is flanked by two octagon towers of a height of 189 ft., and a diameter of 44 ft. These towers were erected under the direction of the architect, Don Juan de la Vega; the eastern tower was finished in 1846, the western in 1862. The columns of the façade are partly of the Ionic, partly of the Corinthian order. Two niches in the façade contain the statues of St. Servando and St. Germano, the patrons of the city, and possessing some claims to antiquity. They were saved from the ancient cathedral of Cadiz, which was burnt down at the time of the English expedition against the city in 1596. They found a place in a new building, still known as the old cathedral (*catedral vieja*), and now used in connexion with the present cathedral.

We cannot attempt to describe the building in detail, but may mention a few of the more salient features. The abundance of marble amounts to prodigality, yet without exceeding the bounds of good taste. Visitors are further struck by the elegance and grace of the presbyterium, the excellent execution of the pavement, and the handsome choir-seats, the work of the famous carver, Pedro Duque Cornejo, and which formerly belonged to the Carthusians of Santa Maria de las Cuevas of Seville. These seats were placed in the cathedral in 1859. The choir screen also deserves mention, as well as the magnificent tabernacle, finished in 1866, and in which is preserved a valuable bronze ciborium. There is also a richly-chased silver chalice here, the work of Antonio Suarez (1664).

A Useful Machine.—The *Cambridge Chronicle* says that Mr. G. Hamit, engineer to the Haddenham Drainage Commissioners, has invented a machine for cutting weeds, or what is commonly called roading rivers, drains, and watercourses. The adoption of this new machine will reduce the cost of "roading" by at least one-half, besides doing the work in a quicker and superior manner. It cuts the weeds and collects them in heaps for the men to gather.

CHURCHER'S COLLEGE, PETERSFIELD, HANTS.

THE Governors of Churcher's College having invited six architects to submit designs in competition for the new College buildings, received the drawings in December, 1877, and submitted them to Mr. Ewan Christian, the architect to the Ecclesiastical Commissioners, to report on their respective merits. In accordance with that report, the design marked "Thoro," submitted by Mr. G. R. Crickmay, of 17, Parliament-street, Westminster, was chosen, and, with slight modifications, has been carried out under his superintendence. The present commodious and substantial building is the result.

The college has been planned in accordance with the modern requirements of a public school. We understand that the building has undergone a critical scrutiny by several experienced masters of public schools, who expressed their approval of the arrangements.

The building is planned with the head master's house at the south-west corner; the kitchen and matron's department at the north-west corner; and the school running eastward from between the two.

The school is arranged with rooms on each side of a corridor, and consists of a spacious dining-hall, library and committee-room, assistant master's sitting-room, class-rooms, and at the extreme east end a large and lofty school-room; and on the floors over are the dormitories for the boys, the assistant masters' bed-rooms, lavatories, bath-rooms, wardrobe-room, &c. The head master's house consists of three sitting-rooms, seven bed-rooms, dressing-room, and domestic offices, and although entirely shut off from the school, it is in such close proximity that he has the complete control of the school, dormitories, and matron's department. The matron's department consists of the kitchen, scullery, and offices, her own sitting-room and bed-room, and the servants' hall and bed-room. The kitchen is connected with the dining-hall by a pantry and servery.

Accommodation has been provided for fifty boarders and 100 day-boys, and provision has been made for future extension, the kitchen and matron's department having been constructed sufficiently large to meet the requirements of a larger school.

It is proposed to erect a gymnasium and fives-court, and a laundry is provided on the east side of the educational block.

The building has hollow walls, and is faced with Godalming Bargate stone with Box-ground stone dressings, the roof being covered with Hamworthy Junction plain tiles, the whole forming a picturesque group. The staircase and corridors are fire-proof. The floors of school-room, class-rooms, dining-hall, and library, are formed of wooden blocks laid herringbone-wise. Open fireplaces have been provided throughout, and Capt. Galton's ventilating grates are used in the dining-hall, library, school, and class-rooms. The principal rooms are finished with trowelled stucco for paint, and with Parian cement dado. Considerable attention is said to have been given to the sanitary state of the premises, and in no case does a drain connect with the school buildings. The premises are supplied with water, and gas has been laid on throughout. The gardens, cricket, and recreation-grounds are about ten acres in extent, and the surrounding country is very picturesque.

The buildings have been erected at a cost of something over 10,000*l.* by Mr. John Crook, of Southampton, Mr. Hawkins being the clerk of the works. Messrs. Lankester & Son, of Southampton, were the contractors for the gas, bell-hanging, and hot-water work.

Practical Christianity. — Archdeacon Denison has circulated in Brent Knoll, in Somerset, a paper setting forth the extent to which he has, during the last quarter of a century, supplied the district with water. Finding that epidemic disease prevailed for want of water, he dug for wells, and has now ten reservoirs, four springs, and eight dams with fountains, filter-beds, tanks, and pumps. The drinking-water is supplied through galvanised pipe directly from the springs. The six lower reservoirs are fishpools, pools for swans and ducks, and drinking-places for cattle. The Archdeacon has spent 1,500*l.* on the works, and he now calls upon the people to take up the matter themselves.

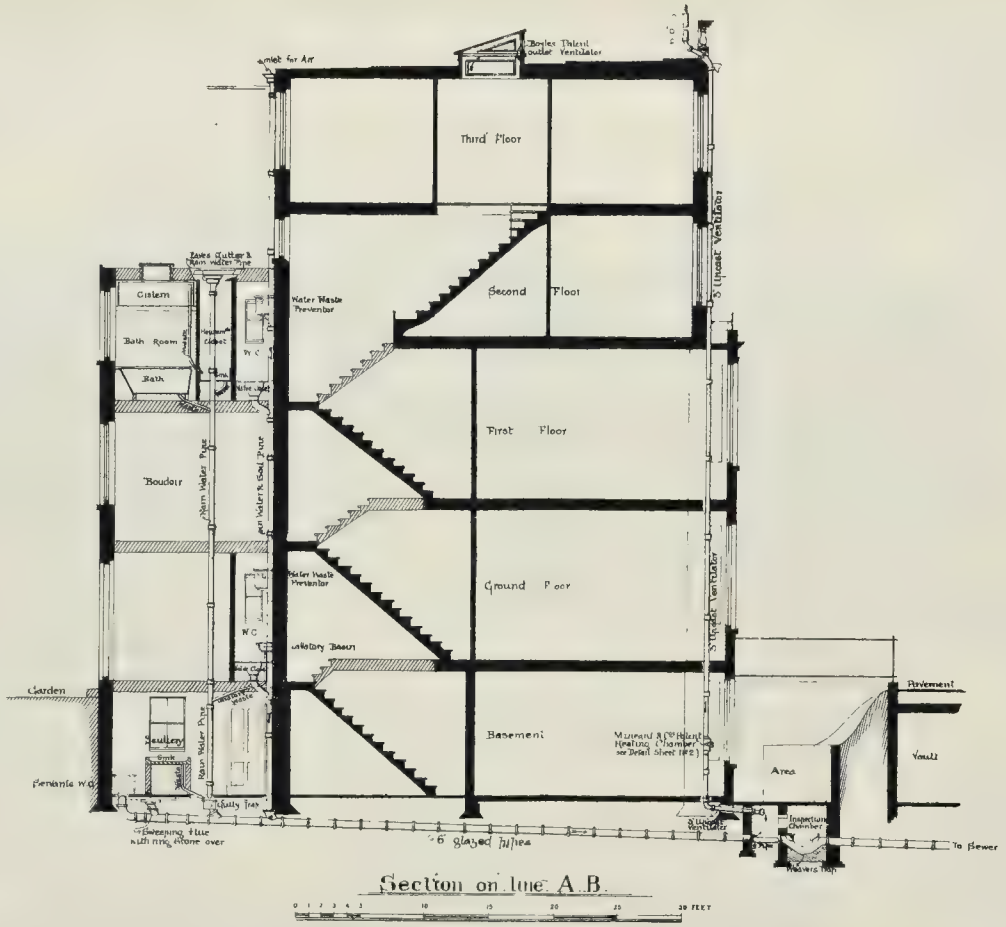
ENGLISH VILLA
ARCACHON: FRANCE.

GEORGE FREDERICK HAINES - ARCHITECT
2 BOSCOMBE ROAD
SHEPHERD'S BUSH W.

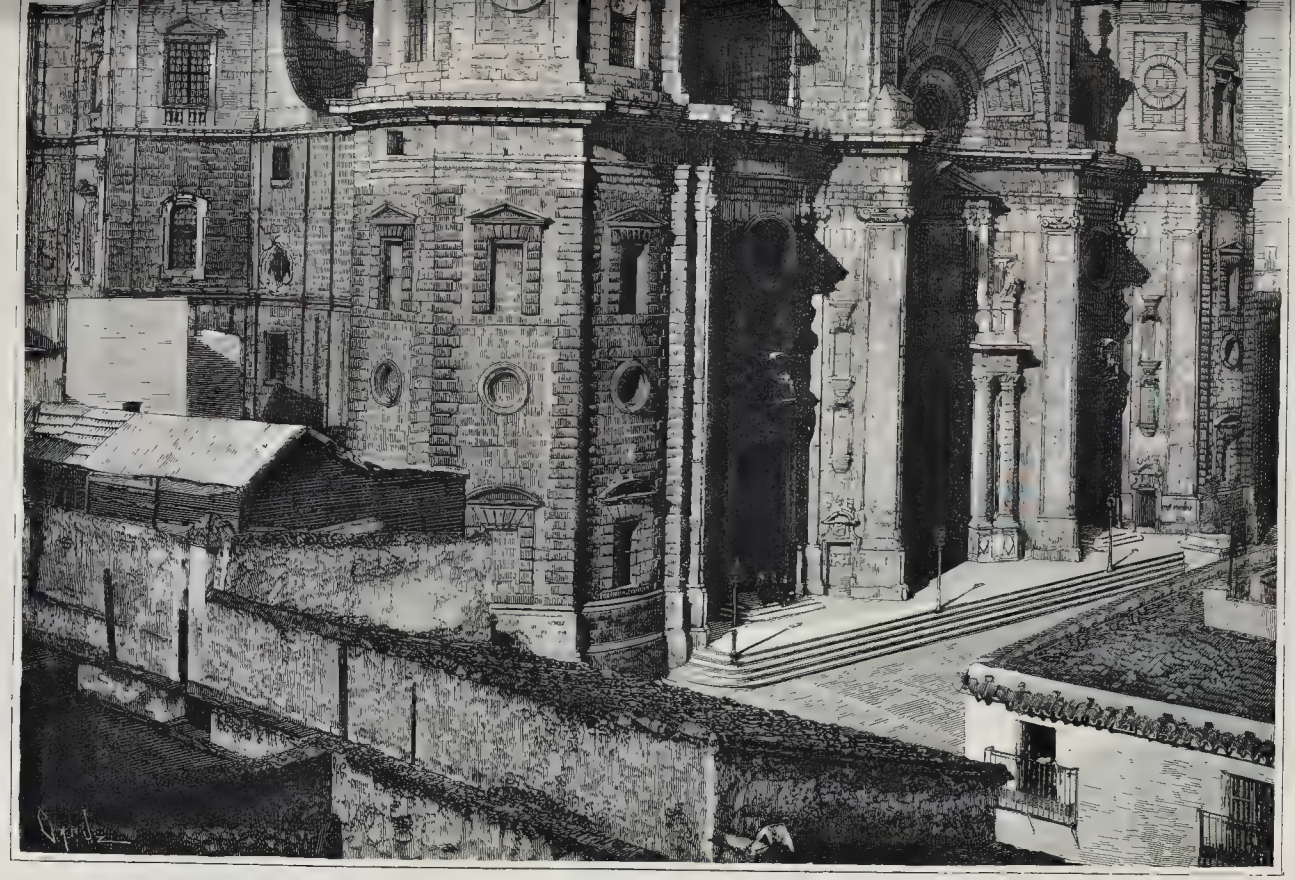


Wyman & Sons Printers 74 Queen.

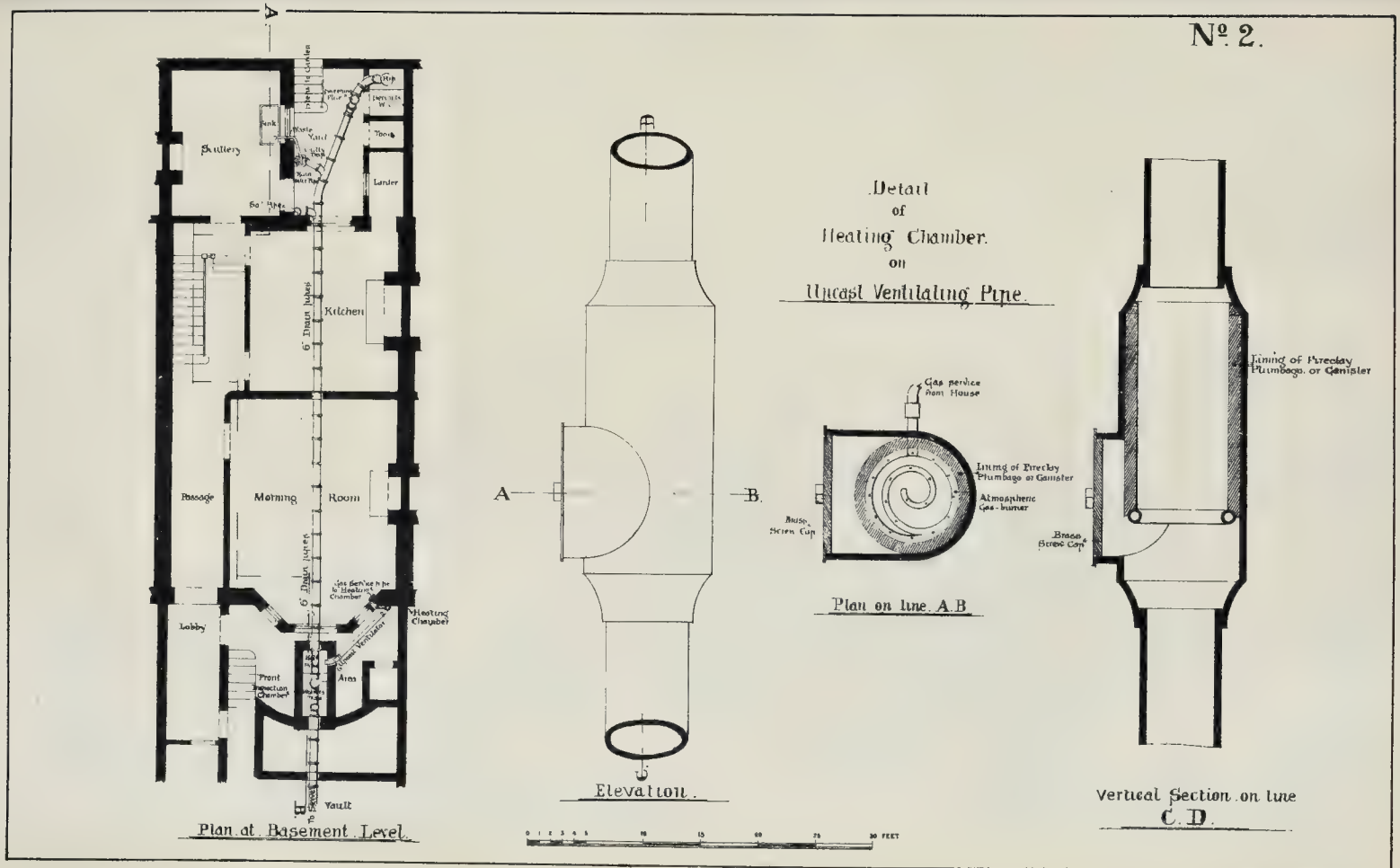
Nº. 1.


Third Floor
Second Floor
First Floor
Ground Floor
Basement
Area
Pavement
Vault
Cistern
Bath Room
Bath
Boudoir
Garden
Scullery
Larder
Lavatory Basin
W.C.
Rain Water Pipe
Soil Pipe
Water Waste Preventer
Fresh Air Inlet
Boyles Patent Louver Ventilator
Rain Water Pipe
Soil Pipe
Rain Water Pipe
Soil Pipe
Rain Water Pipe
Soil Pipe





PRINCIPAL FAÇADE OF CADIZ CATHEDRAL.—Don Vicente Acero, and Don Juan de la Vega, Architects.



C. F. Kell, Photo-Litho, East w. 71 Holborn.

Wyman & Sons Printers 74 Queen St.

PLANS OF SANITARY ARRANGEMENTS TO HOUSES, WARWICK ROAD AND PHILBEACH GARDENS, KENSINGTON.



CHURCHERS COLLEGE : PETERSFIELD . HANTS :

IMPROVEMENTS AT SOUTHPORT.

NEW MARKETS AND PROMENADE.

On the 7th ult. the new markets in Southport,—perhaps the most progressive of watering-places,—were opened by the Earl of Derby. The markets, situated in Eastbank-street, have been erected in the Italian style of architecture, from the designs and under the superintendence of Messrs. Mellor & Sutton, architects, London-street, Southport, Mr. Leigh Heyward being the clerk of works, and are bounded by streets on three sides, with thirteen entrances therefrom, the centre entrance to Eastbank-street having pilasters and columns, supporting figures of Flora and Ceres. Over this entrance will be a clock, to be seen from both the inside and outside of the building, and on the top of the pediment a group of sculptured figures. Surmounting behind is a large octagonal dome, covered with zinc, of fish-scale pattern. The central entrance in King-street is surmounted by a bell-turret, supported by Tuscan columns, pilasters, &c. All the details have been carried out in a bold manner, suitable to the general character of the building, and the whole of the three elevations are faced with Longridge stone. The market is spanned by five bays of principals supported on iron columns and lattice girders, well lighted from lantern-lights in the centre of each bay, arranged so as to exclude the sun's rays as much as possible from the area of the market. The inside of the market is divided into three parts, that for the poulterers, butchers, provision dealers, and greengrocers occupying an area of about 2,660 square yards, the greengrocers occupying the centre, their stalls being in eight blocks of four each, so as to give them a fair chance of equal patronage by each occupying a corner. Cold water is laid on at two points in each block, with standpipe and tap, and sink under. The butchers, poulterers, &c., are ranged round the sides in thirty-five stalls, each having water supply, small stove for cooking, &c. The walls are lined with glazed white bricks to 5 ft. high; the provision stalls have revolving shutters; and the floor of the stalls throughout, with the exception of the greengrocers', are laid with wooden blocks on a bed of cement. The fish-market occupies an area of 719 square yards, and contains twenty-seven stalls, fitted with earthenware sinks, with water supply over the same, and grid underneath, marble fish slabs, small stove, &c. The wholesale portion of the market, which is at the rear of the fish-market, and can be entered therefrom by two doors, or from the butchers' stalls, or from Market-street, contains an area of 824 square yards. The inspectors' office is placed here, and is in two stages. In his office will be the large gas-meter, and he will have control of the weighing-machine, which is placed in Market-street, and is overlooked from his office. Close to this office is a stand-pipe and tap for hot water, to supply the butchers, &c., with hot water for washing purposes. The market-yard is in connexion with the wholesale market, and contains receptacles for fish and vegetable refuse, boiler-houses, &c., and cart-entrance from Queen Anne-street. There is a basement story under the whole of the market for storage purposes. It is approached by an inclined way adjoining the market-yard, and by steps from King-street. The whole of the works have been carried out in a creditable manner by Messrs. Bridge & Son, of Southport and Burscough. The building has cost about 25,000*l.*, and the freehold (which was bought in 1876) cost about 15,000*l.* An Act empowering the Corporation to proceed with the work, and borrow 50,000*l.* for it, was obtained in 1876. It will, perhaps, be remembered that about four years ago, when the Corporation offered a premium of 100*l.* for the best plan for a new market to suit the site, subject to certain conditions, a controversy arose on the subject of the selection of the plan. Three plans were chosen out of twenty-five designs sent in, but as the committee could not agree upon the merits of the three, they were submitted to Mr. Waterhouse, upon whose decision was to rest the award of first, second, and third premiums. Mr. Waterhouse awarded the first premium to a design by Messrs. Coe & Jackson, of London, the second to Messrs. Bell & Roper, and the third to Messrs. Mellor & Sutton, a local firm. With this decision certain members of the Markets Committee were not satisfied, and a meeting of that committee was held to decide the question. At this meeting (says the *Liverpool Post*) Mr. Alderman Sutton (the present mayor and a brother to the local architect) presided, and it was by his casting vote that the design selected as first by Mr. Waterhouse was discarded in favour of the design of Messrs. Mellor & Sutton. This led at the time to much severe comment in the local press of an exceedingly personal character, and although public opinion seemed to discover in this vote of the committee a prejudice which was not altogether the outcome of purely artistic yearnings, the local plan was sanctioned by the Council and triumphantly proceeded with. The committee was of opinion that the Mellor & Sutton plan, "with a few modifications," would meet the essential points defined by Mr. Waterhouse in his report, and recommended that that firm should be "called in." The amount originally intended to be laid out in the structure was 15,000*l.* Among the "instructions to architects" in the competitive designs issued by the committee, was one distinctly stating that "the total cost, including architect's commission, must not exceed 15,000*l.*" The present market has, we are informed, cost upwards of 10,000*l.* more than that amount.

The New Promenade.—The new Marine Promenade, being an extension northward of the Promenade as it existed in 1879, was opened on the same day by the Earl of Lathom. The ground upon which the new promenade is formed cost 8,000*l.*, and the contract for its reclamation, including the formation and paving of road and footways, amounted to nearly 32,000*l.*, the contractors being Messrs. Gripper & Baylis, of London, who have occupied about two years in the work. Forty-eight acres have thus been reclaimed and built up as a continuation of the promenade, which now extends close up to Hesketh Park, the entire promenade being about a mile and a half in length, of which the extension is three-quarters of a mile. The whole of the work has been carried out from the plans and under the supervision of Mr. William Crabtree, the Borough Surveyor, who has prepared a plan showing how the land reclaimed may be made to afford sites for 144 villa residences, all detached.

The "Palace Hydropathic and Spa Hotel."—A new wing to this establishment was opened on the 9th ult. Mr. Littlewood, of the firm of Mangnall & Littlewoods, architects, Manchester, before commencing the designs, visited the most noted hydropathic institutions at home and abroad, and as, we are told, has concentrated all their several excellences in the Palace Hotel. The exterior, which is in harmony with the general character of the old building, is picturesque, the sky-line being well broken up. The wing communicates with the main edifice by means of a wide corridor, from which access is gained to the new dining-room. Beyond this is the recreation-room, a large apartment, with an ornamental coved ceiling, and pilasters of composite design, dividing the wall into panels. This room will be used for concerts, amateur theatricals, and other amusements. At the end of the corridor is a door giving access to a second corridor, lighted from above by means of coloured glass, and perfectly ventilated. The walls are decorated with a dado of tiles, of artistic design. Leading off from this passage are gentlemen's baths, of all kinds, all of marble. To each bath two dressing-rooms are attached. At the end of the corridor is the Turkish bath, a lofty room terminating at one end with an apse, into which stained-glass lights are introduced. Attached to this bath are dressing-rooms and a smoking-room. The ladies' baths, which are similar in style to the gentlemen's, are reached from a corridor on the opposite side of the wing. The baths have been erected under the personal superintendence of the architects. They are approached by the principal drive, but have an entirely distinct entrance of their own. The recreation-room is one of the largest rooms of the kind in the kingdom. It is 80 ft. long, 40 ft. wide, and 25 ft. high. Turkish, salt-water, medicated, electro-magnetic, shampooing, and douche baths, and an inhaling-room, are included in the accommodation provided.

The Baths of Agrippa Unearthed.—The excavations undertaken for isolating the Pantheon have laid bare in the Via Della Palombella the baths of Agrippa. The floor, some six mètres below the level of the street, is strewn with fragments of cipollino marble. The base of a column of the same material, fluted only on one side, and a mètre in diameter, is also visible. An immense fragment of cornice, which surmounted it, has just been unearthed.—*Daily News.*

POLITICS AND THE TRADE UNIONS CONGRESS.

Sir,—Surely the almost exclusively political character of the proceedings of the Trade Unions Congress is greatly to be regretted. It is not easy always to draw the line between those considerations which may affect the welfare of any particular trade, or, indeed, of any collection of trades, and those which refer to the political institutions of the country. But it should be remembered that there is a very great contrast in the conditions under which the two categories of subjects can be approached in any such meetings as those referred to. As to the welfare of a trade, regarded as a guild, or fraternal association of masters, journeymen, and apprentices, or anything approaching that ancient and honourable order, the members have special information. Each class or grade in such a trade knows what affects itself most readily, and it may be of common service to hold such a parliament of trades as shall bring this special information under full and intelligent discussion.

With regard to political discussion, on the other hand, there is no subject which demands such broad and accurate knowledge rightly to approach. It is not a matter as to which knowledge is instinctive, or which the special experience of an individual, or of a small class of individuals, has any but an infinitesimal value. Politics is one of the most difficult, as it is one of the most important, of human sciences, and it is only as a science that it can be studied or approached with advantage. The idea that the reference to a few axioms or supposed necessary truths, joined to some fluency of speech, and a good deal of earnestness of purpose, is enough to make a man a politician, is not only false, but mischievous. To be able to form any clear and correct opinion on a political question requires a large amount of accurate and well-based historical knowledge. The leading problems in politics are few. They were discussed by the highest human intelligences, under the most favourable circumstances, two thousand years ago, and though conditions have since then widely changed, principles remain the same. For any man to be able to form an opinion that is worth two straws on any question of politics, in the higher sense of the term, he must know, first,—what are the elements of the great political problems; and secondly, how the relation of those elements has been illustrated by the whole course of ancient and modern history. To historic knowledge down to the present day must be added a considerable amount of statistical knowledge. And all this must be guided by practical acquaintance with the laws of thought and with the nature of logical sequence.

A fit education, therefore, for a political speaker is hardly possible out of those classes in which a certain degree of affluence admits of the devotion of a considerable number of years to the acquisition of a very sound education. Among those young men who are training to compete for the daily more difficult entry to the Civil Service, the Bar, the Church, the Army, the Medical, Architectural, or Engineering professions, there are few who have ever an hour to spare for the systematic study of politics. The exigencies of competitive examination are daily narrowing, and, in my opinion, impairing, the education of the more educated youth of England. And as to those who have to go early in their teens to the plough, the loom, the forge, or the shop, any education in one of the highest branches of human study is entirely out of the question. What is the result of the discussion of such a subject as the effect of vaccination by men ignorant of the very rudiments of physiology, of pathology, or of therapeutics? What ideas of the movement of the heavenly bodies can be formed by persons wholly ignorant of geometry, and of the special branch of trigonometry? What idea of the art of war can be formed by a man who has never seen a more orderly muster than that of a flock of sheep or a drove of pigs? Knowledge, it must be remembered, is only to be attained by hard, patient, and unintermitting study. The higher grades of knowledge are only to be attained by those who have patiently and faithfully passed through the lower grades.

For this reason all such counsels as tend to divert the studies and the energies of any class of men to matters which their education has not fitted them to grasp, and for the mastery of which they have neither the leisure

nor the preparation, must be regarded as mischievous. Nor can it be helped if this opinion seems to bear as hardly on certain discussions in Westminster as in yet more recent debates in St. Andrew's Hall.

An Old Hand.

SAFETY IN RAILWAY TRAVELLING.

Continuous foot-boards, door-locks for carriages, and other appliances intended to ensure safety in railway travelling, were discussed in a paper read by Mr. R. Pickwell before the Mechanical Section of the British Association. The author referred to the importance attached by the Board of Trade to continuous foot-boards, &c., and other means of reducing the possibility of accidents occurring. After giving statistics as to the number of passengers killed and injured by falling between trains and platforms, or in attempting to enter or alight from trains in motion, and the compensation paid for personal injuries, the author explained the working of an appliance connected with a railway carriage door on view in the room, his description being as follows:—The machinery and automatic arrangements attached to the carriages are so arranged that the carriage-doors are no longer entirely in the hands of the passengers, but under the absolute control of either the engine-driver or the guard, and operate as follows:—When a train is standing at a station platform, and taking in or setting down passengers, all the carriage-doors are released, and can be opened and closed at pleasure, as is the case with the existing carriages, and no difference can be observed between the patent and the existing carriage-doors; but the dangerous space between the foot-boards and the station platform (usually a few inches), and which the Board of Trade call special attention to, is bridged over throughout the length of each carriage by a movable foot-board placed over the usual one, which, by the arrangement, is always kept in this position whenever the train is standing at a platform. When the time for departure arrives the signal is given by the guard, and the engine-driver by means of a valve, at one operation, gently closes all the doors left standing open, and locks the whole of the doors from end to end of the train, at the same time the movable foot-board is withdrawn to a position over the existing foot-board, and the train travels to the next station. On arriving at the next platform the engine-driver, by a similar operation of the air-valve, instantly releases all the doors from end to end of the train, and at the same instant the movable foot-boards advance outwards, and completely bridge over the spaces between the platform and the wheels as before; in this position passengers can alight from the train as at present. On leaving the platform again the same operation is gone through, as already described. In closing the carriage doors no serious accident need occur by a passenger being trapped in the act of entering a carriage, as, at the time of closing, a signal-bell would be struck on each carriage, and the doors can be closed as slowly as may be desired; and, in addition, a spring-box is attached to the closing levers, so as to enable a passenger, if so caught, to push the door open and release himself, after which the door will at once spring to and become locked, the same as all the rest of the doors. The whole of the apparatus is made to act automatically, so that in case of collision or break away the whole of the doors from end to end of the train would be liberated automatically, and the passengers could leave the carriages at will. As the operation of opening and closing may be instantaneous, or may be regulated at will, no time need be lost on arriving at a platform in releasing the doors; and again, on leaving the platform, the doors being closed all at one time, may be done so more slowly than at present, and the chance of trapping is prevented; which frequently happens at present, when one porter has to rapidly close the doors of a whole train as it passes on leaving the platform. The author believes that were the above appliances in use, that class of accidents which form such a large percentage of the whole would be greatly reduced, such as falling between carriage wheels and platforms, alighting from and entering trains in motion, closing doors, and falling out of carriages whilst in motion. Should a passenger fall in entering or alighting from a carriage whilst standing at a platform, he cannot get between the wheels and the platform; whilst the possibility of persistent travellers entering or alighting from carriages whilst in motion is prevented, the doors being locked until the moment the train stops. Also the possibility of a carriage door flying open, and passengers falling out is prevented, the doors being locked until the next platform is reached. The foregoing are the advantages to the public to be obtained from the adoption of this system. The railway companies are perhaps as interested in the matter as the public, but from an economic point of view. The amount paid for accidents by the companies of the United Kingdom may safely be said to amount to 200,000*l.* annually.

THE DUBLIN SCIENCE AND ART MUSEUM COMPETITION.

In this competition, advertised in our pages, sketch designs are to be first sent in, from which a committee, including at least one architect, will select five. The authors of these will be invited to enter into a final competition, carrying out strictly their original proposals, and each will receive 150*l.* towards expenses. The competitor ultimately selected is to receive a fixed sum equal to five per cent. on the amount the Treasury may authorise to be expended on the building. The sum stipulated for the entire cost is 100,000*l.*

ARCHÆOLOGICAL NOTES.

Berks Archæological and Architectural Society.—About thirty members of this society, under the guidance of Mr. W. L. Nash, of Reading, the hon. secretary, paid a visit to Basingstoke on the 22nd ult. The party proceeded to inspect the ruins of the Chapel of the Holy Ghost, and also the Parish Church. The Rev. Dr. Millard pointed out the features of interest in both buildings. The party then proceeded to Basing Church, where Dr. Millard, at the request of the Vicar of Basing, again acted as guide. The ruins of Basing House were next inspected, under the guidance of Mr. C. F. Cooksey, the hon. secretary of the North Hants Archæological Society, who read a paper upon the history of the place. On the return of the visitors to Basingstoke, they were entertained by the Rev. Dr. Millard, as president of the local society, at the Old Angel Café.

Discovery of a Roman Monument at Hexham.—The *Newcastle Courant* says that on the 21st ult. a remarkable Roman monument was discovered in the porch of Hexham Abbey Church. Mr. Hodges, an architect, now engaged in bringing out a series of illustrations of the church, and Mr. Robert Robson, the clerk, while excavating in the Slype came upon a large slab a few feet below the surface. On further investigation, a monument, about 7 ft. long and 3 ft. 6 in. wide, in a good state of preservation, was disclosed, the upper portion containing a figure of a mounted warrior, bearing the Roman standard, with his horse in full career, and a conquered foe at his feet. Below this is a tablet with the following inscription:—

DIS MANIBVS ELAVNVS
LQ ALAE PETR SIGNIFER
TVRCANDIDI AN XXV
STIP VII H S

From this inscription it would appear that the hero of this monument was a standard-bearer in the Troop Candidi of the body of cavalry known as the Ala Petriana.

ALL SAINTS', SOUTH LAMBETH.

The Church of All Saints, South Lambeth, built some three or four years since by the firm of Messrs. Lucas Bros. at a cost of 13,500*l.*, exclusive of the site (1,200*l.*), has already been found too small for the crowded congregations assembling there. Mr. Sidney Smith, architect, was instructed to draw plans, &c., for the addition of transepts, and these are being carried out, and just reaching completion, by Mr. Wm. Shepherd, of Bermondsey New-road.

The congregation requested the southern transept to be made as a memorial of their love and esteem for the vicar, and to their credit be it said that though in five years, directly and indirectly, they have raised 14,000*l.* for the building, &c., of the church, yet in six weeks they have again promised a sufficient sum to cover the expense of the new transept.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,911. J. Wetter, New Wandsworth. Reflectors. (Com. by W. Wheeler, Massachusetts, U.S.A.) Sept. 9, 1881.

3,961. R. H. Reeves, Parkhurst. Construction of drainage for the purpose of destroying noxious gases, &c., arising from sewage. Sept. 14, 1881.

3,968. F. T. Bond, Gloucester. Heating water for domestic purposes, including an improved gas-burner. Sept. 14, 1881.

3,972. S. C. Davidson, Belfast. Stoves, &c. Sept. 14, 1881.

3,985. H. H. Lake, Southampton-buildings. Door and other knobs. (Com. by C. C. Harrington, Newton, U.S.A.) (Com. spec.) Sept. 15, 1881.

NOTICES TO PROCEED

have been given by the following applicants on the dates named.

Sept. 13, 1881.

2,000. E. Edwards, Southampton-buildings. Wrought-iron window-frames. (Com. by C. A. Schütz, Stralsund.) May 9, 1881.

2,040. P. Jensen, Chancery-lane. Production of artificial stone or composition, &c. (Com. by E. J. Erichsen, Copenhagen.) May 10, 1881.

3,620. J. Craig, Kilmarnock. Dressing enamelled bricks, tiles, or slabs. Aug. 19, 1881.

3,826. E. L. Dietz and M. A. Dietz, Oakland, U.S.A. Dust-pans. Sept. 2, 1881.

Sept. 16, 1881.

2,059. A. Guattari, Covent-garden. Producing upon marble, &c., designs, in imitation of sculpture. May 11, 1881.

2,087. G. Osborne, Brighton. High-pressure regulating taps or valves. May 13, 1881.

3,081. W. Dawes, W. H. Thompson, and D. Thompson, Leeds. Water-closets and urinals. July 14, 1881.

3,811. H. Hall, St. Pancras. Tiles for facing or lining walls, &c. Sept. 1, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending Sept. 17, 1881.

505. T. Rowan, Ryde. Chimneys or flues.

To provide an effectual up-draught, the flues open into a chamber from which passes a shaft on the top of which is a cowl to produce an induced current. To purify the smoke an additional chamber is fitted above the former chamber, which is supplied with a damp porous material. Feb. 5, 1881. Price 6d.

527. A. Clark, New Cross. Water-closets.

The wood framing is dispensed with, and the casing is constructed of porcelain, &c., in one piece with a sloping partition leading to the trap for receiving the contents of the basin. This basin is of the revolving or lift-up kind, and is provided with a flushing-pipe and scraper. Feb. 7, 1881. Price 6d.

540. E. H. A. Herbert, Erith. Apparatus for creating an upward draught in chimneys, shafts, &c.

The chimney-shaft is capped by an elbow, supported so as to be capable of rotation by the air acting on a blade above its horizontal part. Through the vertical part of the elbow is a smaller pipe, with an enlarged mouth-piece, which is presented to the wind, and thus draws out the contents of the vertical portion. (*Pro. Pro.*) Feb. 8, 1881. Price 2d.

550. S. H. Sharp, Leeds. Manufacture of fire-grate card-board ornaments.

These are made of one piece, and an ornamental design is stamped out of them to allow a free passage of air. (*Pro. Pro.*) Feb. 9, 1881. Price 2d.

557. J. Davidson, Auchmill. Draw-off taps of kitchen boilers.

These are formed so as to serve also as safety-valves. The shell has an enlarged chamber, having a horizontal partition across it, which divides the inlet part of the tap from the outlet part. Through the centre of this partition is formed a hole, fitted with a valve with a stem which passes out through the shell, and is fitted with a weighted lever. The tap is opened to draw water off by raising the lever. Feb. 9, 1881. Price 6d.

561. C. D. Phillips, Newport. Roofing tile.

On each of the four sides of the tile is formed a system of grooves with corresponding tenons, so that each tile shall lock into the four surrounding ones. Feb. 9, 1881. Price 6d.

571. H. Mestern, Berlin. Apparatus for ventilating, cooling, and warming buildings, &c.

Two chambers are used, one inside the other, with a space between them. The inner one is open at each end. At the upper part water under pressure is admitted through a nozzle into the top of the inner chamber, into which air also is free to enter. The water ejected from the nozzle with great force fills the inner chamber with a finely divided spray of water, and draws with it the air from the room. The water escapes from the bottom of the outer chamber by a pipe, and the air being released passes up the space between the two chambers, and escapes into the room purified and cooled; or, if hot water issued, heated. Feb. 10, 1881. Price 6d.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

581. F. Edwards, jun., Great Marlborough-street. Slow-combustion smoke-consuming grates.

The fire-place is charged with sufficient fuel for the day, and is lighted on the top. A balanced screen is moved down in front of the bars as the fire burns away to expose the fuel to the action of the air. The improvements in this invention are the manner in which this screen is balanced and hung. Casings of metal are attached, one on each side of the front of the grate, and constructed to contain the pulleys and counterweights for the screen. These casings are also flanged or grooved on their inner sides to act as guides for the screen. The grate has a solid bottom. Feb. 10, 1881. Price 6d.

582. J. Sherwood, Birmingham. Galleries of gaseliers.

To one of the arms is pinned a free cranked lever governed by a spring. On the glass being placed in position, the spring presses the lever against the glass. Feb. 10, 1881. Price 4d.

602. L. Appleton, Brecknock-crescent. Appliance for preventing the bursting of water-pipes by frost, &c.

This is a vent-tap or cock, which, in addition to the usual passage, has a lateral aperture communicating directly with the main passage of the plug, and allows air to flow into the pipe when the cock is closed. (*Pro. Pro.*) Feb. 11, 1881. Price 2d.

EDINBURGH.

The Burgh Engineership.—Mr. Fraser, the burgh engineer, has resigned his office on account of ill-health, but he will continue to act as consulting engineer. The sub-committee of the Lord Provost's Committee, appointed to prepare a report on the duties and salaries of the officer to be appointed in the room of Mr. Fraser, as also with reference to the management of the streets and foot pavements, previously to steps being taken for filling up the vacant office, have resolved to recommend that the supervision of pavements should be transferred to the Roads Department, and Mr. Proudfoot's salary continued at 400*l.* a year, the new burgh engineer, in consideration of the advice to be afforded by Mr. Fraser to the gentleman appointed, to receive a salary of 300*l.* An amendment to the effect that an experienced engineer should be appointed at a salary of 500*l.* was negatived.

The Old Infirmary Buildings.—The sub-committee of the Treasurer's Committee of the Edinburgh Town Council, charged with the arrangements for the conversion of the portion of the Old Royal Infirmary buildings, purchased by the Corporation for the purposes of a fever hospital, have (according to the *Scotsman*) instructed Mr. Morham, the City Architect, to proceed with the preparation of the necessary plans; the burgh engineer, to examine and report as to the drainage; and Dr. Littlejohn to report as to the allocation of the wards for different kinds of infectious diseases.

MONUMENTAL.

The Eurydice Memorial.—A monument, the preparation and erection of which has occupied twelve months, has been placed in Haslar Naval Cemetery, to the memory of the officers and men who were lost in the training-brig *Eurydice*, in March, 1878. The base, which is of polished granite, and records the names of 316 officers and men who went down, was prepared by the convicts at Chatham, while the superstructure was prepared by the convicts at Portland, with stone from the neighbouring quarries, and resembles a huge rock, which is surmounted by the real anchor of the *Eurydice*, embedded in the rock. The memorial was designed by Colonel Pasley, R.E., director of works, and it has been erected by the Works Department of the Navy.

The late Dean Stanley.—The daily papers say they have reason to believe that it is the intention of Dean Stanley's successor to take an early opportunity of calling a meeting to consider the best mode of raising within the walls of Westminster Abbey a monument to his lamented predecessor. It is understood that a proposal which has already received influential sanction, as both appropriate in itself and likely to receive wide and general support, is that of an altar-tomb, with recumbent statue, to be placed in the Chapel of Henry VII., in the immediate vicinity of the grave in which the remains of the late Dean were so recently laid by the side of those of Lady Augusta Stanley.

Torquay.—The Local Government Board have sanctioned a loan of 3,000*l.* for the purpose of erecting a Sanatorium at Torquay. Mr. Ernest Turner, of Regent-street, is the architect.

TECHNICAL EDUCATION FOR "THE UPPER TEN."

MURAL DECORATION.

SIR,—Notwithstanding the labours of a most efficient Royal Commission of some forty years past, and all that has been written since on mural decoration, the crass ignorance on the subject appears to remain as unshaken and as immovable as ever. For instance, in your leader of Sept. 17, you have to call attention to the flagrant violation of so elementary a principle of decoration as that against introducing pictorial glass into chambers in which mural painting is destined to play a conspicuous part. The two are incompatible. This was authoritatively laid down in the reports of that Royal Commission; how uselessly, we see, from the fact that the very chambers in which the members of that Commission used to meet and deliberate are being treated in direct contravention of the precepts they had so carefully gathered to guide the decoration of the palace at Westminster. But knowing, as all men who have carefully studied the history of art know, how important the encouragement of mural painting is to national art, no stone must be left unturned in the endeavour to help the *dilettanti* to a better understanding of the subject. I therefore beg leave to subjoin a few concise memoranda upon the noble art of mural painting.

1. In the decoration of a building, pictorial glass and mural pictures are incompatible; for neither oil, fresco, nor encaustic colours can compete with the chromatic brilliancy of glass. Grisaille, with a small plaque of moderated colour, is the utmost that should be permitted when mural painting is to be the leading decoration.

2. By far the larger number of the finest paintings ever executed were painted in fresco: were decorative works.

3. Mosaic is an imperfect method of execution, and can only be appropriately employed in out-of-the-way spaces,—spaces far removed from the eye.

4. The execution of mosaic was thoroughly understood in the time of the great Italian painters; nevertheless, it was only sparsely employed, under the foregoing conditions. Perhaps mural painters only can thoroughly understand the ridicule with which Michelangelo and Raffaelle would have received a suggestion that their grand works in the Sistine Chapel and the Stanze of the Vatican should be executed in mosaic.

5. Mural painting is the most difficult branch of the fine arts, requiring long and special training. A painter who has been successfully educated to paint easel pictures may yet be totally unfit to grapple with the conditions of mural painting.

6. The *technique* of fresco painting is much more difficult than that of oil. The permanence of fresco depends on the permanence of the mortar on which it is painted, and we have specimens of mortar as hard as stone after an exposure of a thousand years to this climate.

7. If you want fresco-painters you must raise them. Continued demand would bring efficiency. A great country must be at the cost of some failures in painting, as it has been in some other more expensive matters.

8. The fine-art manufactures attained their fullest development in those two epochs in which painting and sculpture were immediately associated with architecture.

9. Seeing, then, of what vast importance the training for mural painting is to the manufacturers of a country, any one who stands in the way of its adoption in England cannot have the improvement of our manufactures seriously at heart.

10. Mosaic is quite out of court as a method of decoration save and except under those certain conditions we have referred to. But whether in fresco, spirit fresco, tempera, encaustic, water-glass, or even oil, let us have, for the sake of the arts and manufactures of the country, a school of mural painting.

11. It is a common mistake of hon. members to call any painting upon a wall a fresco, whereas they ought to know the term "fresco" is only properly applicable to that kind of painting which is executed in colour and water on fresh mortar; the mortar when dry holding the pigments in its film of carbonate of lime. The vehicle of spirit fresco is wax, oil, &c. Spirit fresco is a new process whose durability is not yet proven. Tempera is colour mixed with size. Encaustic is the use of liquefied wax; the term *encaustic*, however, is ; properly applied to painting with wax when heat is used in the process. Water-glass painting is the use of a solution of silicate of potash over the painting in colour and water on th dry mortar; these colours it incloses in a glaze of silicate.

W. CAVE THOMAS.

THE CHURCHES AND TOWNS OF BUCKINGHAMSHIRE.

SIR,—Is your correspondent, Mr. Joseph Simpson, really under the impression that there are no larger or more beautiful churches in England than that of Newport Pagnell? It would seem so, from the following extract which I have copied from his letter:—

"Does he know Newport Pagnell? Here is a town, although with a population of some hundreds less than 4,000, yet with a church which for size, beauty (both of external situation and internal arrangements), and attendance is not to be surpassed in this or any other county."

Now if the words "size" and "beauty" refer to the church in question, I can only suppose that Mr. Joseph Simpson has never been out of Buckinghamshire, because, leaving cathedrals and monastic churches out of the question, it is simply ridiculous to compare Newport Pagnell Church with any one of the famous Lincolnshire churches,—Louth, Newark, Grantham, Raunds, Higham Ferrars, &c.,—or with the Suffolk churches, such as St. Mary's Bury, Lavenham, Long Melford, Southwold, &c.; or those of Norfolk,—Walpole St. Peter's, Tarrington St. Clement's, Salle, East Dereham, Cawston, Cley-by-the-sea, Worstead, St. Peter's and St. Stephen's Norwich, St. Margaret's and St. Nicholas Lynn; or with the great Yorkshire parish churches, Rotherham, Patrington, &c. But to come nearer home,—to the counties adjoining Buckinghamshire,—does Mr. Joseph Simpson for a moment mean to compare Newport Pagnell Church with that of Leighton-Buzzard, or even with Luton, or with Ewelme, in Oxfordshire? I have not mentioned monastic churches; that would really be too ridiculous.

If the words "size" and "beauty" refer to the "exterior situation" the first of the words is unintelligible, and equally so if they are intended to refer to the "internal arrangements." If Mr. Joseph Simpson means them to refer to the "attendance," I will not argue the point for a moment; I dare say the congregation is large and *beautiful*.

Although Mr. Simpson has kindly attempted to set me right with regard to Buckinghamshire, I fear I must remain in obstinate darkness, if enlightenment means the acknowledgment that Buckinghamshire is a good field for ecclesiology, or that its towns are cheerful and rich in old churches. Look, for instance, at Buckingham, Stony Stratford, Fenny Stratford, Slough, Great Marlow, Wolverton, or even Aylesbury: can they be called lively places, or can their churches be regarded as fine examples of ancient architecture?

Buckinghamshire is one of the very few counties in England which contains no great representative church, and not one monastic church;* nor does it contain any very important parochial churches. The village churches are small and far apart; several of them, I confess, are of considerable archæological interest; such, for instance, as Stewkley, Wycombe, Caversfield, Upton, Wing, Stantonbury, Chesham Bois, Langley, Burnham, Mentmore, &c. These, together with the churches mentioned in the article upon Maids Morton Church, form the chief attractions for the ecclesiologist in Buckinghamshire, and I think I am quite justified in saying that it is by no means a rich county for the ecclesiologist. To compare it with Lincolnshire, Norfolk, Suffolk, Northamptonshire, Somersetshire, and Wiltshire would be absurd, nor can it even hold a place in comparison with the adjoining counties of Oxfordshire, Berkshire, Bedfordshire, Middlesex, or Herts. I may mention the facts that I have visited Buckinghamshire every year for the last

* At Chetwode is a portion of an old monastic church, of very beautiful Early English work, but it can never have been a very important building as to size. The county is remarkably poor in monastic remains; a few fragments alone exist of the Abbeys of Burnham and Nutley. I am told that a part of the cloister still exists at Ashbridge, but I have not seen it. It is strange that although the county once possessed several important castles, not one single stone of any such edifice is to be found at present *in situ!* Buckinghamshire is probably the only county in England of which this can be said.

thirty, and that I have walked over a great portion of the county, and the impressions left upon my mind are, that, with the exceptions of Olney, Hillesdon, and Chetwode, the larger churches are rather poor examples of Mediæval architecture; that the village churches, with few exceptions, are less interesting than those of other counties; and that the towns are singularly dull and ugly, and, as a rule, devoid of objects of antiquarian interest.

THE WRITER OF THE ARTICLE UPON MAIDS MORTON CHURCH.

THE WORD "NATURE" IN REFERENCE TO ART.

SIR,—I have no doubt but that you are right in taking exception to the way in which I expressed myself in my last letter, but at the same time I do not see how this affects the original question,—whether I am wrong in saying "that all ornament should be founded on a geometrical basis." Although this is laid down as one of the "principles" in "Suggestions in Design," it is not intended that it should ignore the fact that there is much ornament which is non-geometrical. I have purposely stated that the principles given are founded upon the practice of art in the *best* ages. If you ask me what I mean by the best ages, I would say, roughly speaking, the Greek and the Early Gothic.

There is, more or less, a geometrical or regular foundation underlying everything in nature, whether it be organic or inorganic, although in its development it is apparently so extremely irregular. When I refer to "nature," I do not confine the expression to one view of nature only, but to nature in its widest and most extended sense,—to the principles or laws, wherever they can be discovered, which can in any way be made applicable to the purposes of ornamental art. I cannot, therefore, consent to be restricted to look at nature in three different ways, or to state "whether I mean according to *metaphysical laws* or *physical laws*." It is true that I may not be able to see far into the hidden laws or concealed principles in nature, and that I may yet be like a child picking up mere grains of sand on the sea-shore; but that such principles are to be discovered, I am convinced, and they may be made available as the groundwork for all art-workmanship.

It may be that I have not stated my position as logically as could be desired, being, as you say, more at home with the pencil than the pen; but all my life I have endeavoured to study nature in this way, searching for principles of growth or formation, which should guide me in the composition of ornament, and not merely for the purpose of copying the physical form. If I take a leaf or a flower as a *motif*, I strive to understand its principle of formation, and work upon that, rather than to imitate the form I see before me, so that my leaf or flower may, apparently, be very unlike that from which it is taken. I may be singular in my notions, but this I believe to be the only true way of applying nature to art, and that all art, in its broadest sense, should be founded upon nature. I cannot, therefore, see that it is necessary or advisable that I should define exactly what I mean by "nature," or whether I look upon it in a *physical* or a *metaphysical* sense. What I advocate is, to take advantage of natural laws wherever they can be perceived, to adopt the external form when suited to the purpose in view, but above all, not to compose anything which is *un*-natural.

JAMES K. COLLING.

CONVEYANCE OF MATERIALS.

SIR,—Some time ago I observed in use at the constructing of the fortifications at Strasburg a method of conveying building materials from one place to another, and have since seen the same in use in America, for conveying goods from the manufactory to the warehouse. I understand it to be an endless wire rope that is kept moving (by machinery) between the factory and the warehouse, and the goods are attached to the rope when passing. Will any of your readers kindly furnish me with the address of parties who fit up such appliances, if there are such in this country? J. A. G.

The Interior of Holy Trinity Church, Leamington, has just been improved by the addition of a carved Caen stone pulpit, with marble shafts, and oak choir-stalls. Brass gas-standards and lectern have also been added. The work has been executed by Messrs. Jones & Willis.

"THE TREATMENT OF CANDIDATES."

SIR,—Your heading and report upon this subject in relation to the recent appointment of Waterworks manager at Middlesbrough calls loudly for some comment upon the manner in which candidates for public offices are frequently treated. We have recently witnessed the creation of several municipal bodies and the farcical proceedings they inevitably inaugurate, of advertising for a staff of officials, when at the same time they have no intention, or the very remotest one, of changing those who have already held office under their tatelary powers as local boards, &c. This, I contend, is altogether misleading and insulting to the intelligence of the men for whom they advertise. Indeed, our Nestors of municipal power seem to be frequently at sea as to what is their plain duty, and the *modus operandi* they ought to and should pursue in the selection of candidates.

I leave you, sir, to imagine the feelings of disgust with which candidates look upon such proceedings, and the contempt which they naturally feel for these "most potent, grave, and reverend signors," and the curses, not loud but deep, for the trouble and expense to which their folly frequently puts many a poor candidate. CONSTANT READER.

LONDON FRONT GARDENS.

SIR,—There can be no question that a small open space in front of a London house, where a tree or shrubs can be planted, does add much, as Messrs. H. & R. Powell point out, to the agreeable character of a street. I am inclined, however, to think that it is most satisfactory if a single tree is planted near the outside edge so as to shade the pavement, or a line of shrubs is placed on this outside edge as a screen, and the interior part covered with plain tiles, on which shrubs or flowers in boxes can be placed. This prevents the untidy and dismal appearance seen in too many front gardens, even on Campden-hill, as the space, if left unadorned florally, is at any rate neat. Nor is a little strip of so-called garden at all times an unmitigated blessing, for in Stafford-terrace, Campden-hill, one of the streets mentioned by your correspondent, the stupid builder has placed the larder beneath the garden, so that it is damp instead of dry. Passing, like your correspondent, the other day along this street, I observed the earth being carried away, and the garden space about to be filled with cement and tiles by some occupier, who, as several other tenants have already done, was remedying the mistakes of the builder.

AN OBSERVER.

MANAGEMENT IN THE WORKSHOP.

SIR,—I am glad to see that you have opened your columns to a communication on the subject of "management in the workshop," and have read with satisfaction the letter of "Observer," in which he mentions some of the evils of the present system. There are, however, several he has omitted, and others which I think should be brought into greater prominence. With your permission, I should like briefly to refer to two or three of these, and in doing so shall speak from my own personal experience and observation. I have known several instances in which young men have come up from the country with slight practical knowledge, but with a friendly introduction to the head foreman. The latter, in consideration of a premium or a weekly present, soon places them in positions for which they are utterly unqualified. Do not suppose this was merely a Christian act. In some cases I know the premium has been 20*l.*, whilst, in others, the man pays his foreman so much "blackmail" every week. The "greenhorn," as I may call him, is generally placed by the foreman with a competent man, who, being thus handicapped with an inferior hand, is unable to get out the work as expeditiously as he would were his companion competent. The consequence is complaints come from the office that a certain job has cost too much, and the next thing is the discharge, not of the friend of the foreman, but of the competent hand, who is sacrificed for no fault of his, whilst his useless mate is kept at the bench to the advantage of the foreman, though to the disadvantage of the employer. If managers or masters would inquire of the men how these unaccountable things occur, instead of leaving everything in the hands of subordinates, they would find it more profitable than the present system. I have known many cases in which quantities of material were spoiled by the incompetence of the setter-out,—invariably a relative or friend of the foreman. Wood sent up to the shop I have known rendered useless for the job for which it was intended, owing to the lengths being wrongly taken off; the rods, whilst in other cases, when (it seemed as if by accident) the sizes were right, there was nearly double the quantity required. This, it is needless to say, showed either gross ignorance or great stupidity, but whichever it was the master suffers.

I can fully confirm "Observer's" remarks respecting "Cousin Jackey," who appears to be of a more prolific family in London than we often meet with in provincial towns.

ONE WHO KNOWS.

*** Other correspondents make similar statements. We have also received a letter signed "One of Them," denying the correctness of "Observer's" comments, but this can only represent the writer's own experience and practice, and does not affect the charges made. There are, of course, large numbers of foremen acting in the best and most honourable manner. The only question is whether the practices described are carried on to any extent by others, and the letters which have reached us seem to show that they are. Employers should themselves look into the matter.

UNSANITARY BUILDING.

SIR,—At no time does the profession of an architect appear more valuable to the general public, and his services more necessary, than when diseases of a loathsome and dangerous character become rampant. This year small-pox, scarlet fever, typhoid fever, and measles have extensively prevailed, and I cannot help thinking that if the dwellings of the humbler classes and many of the middle classes, were properly constructed, kept in a good and proper state of repair, and clean, according to the best known methods of executing the various branches of work connected with the building trade, there would be very much less disease. But, unfortunately, too much of the work in the building trade is executed without any regard to efficiency or the laws of health, and in the course of time neighbourhoods which have once been known as healthy have become notorious for disease, and many persons have been brought to ruin by the depreciation of the value of their property, and the poorer classes have become pauperised from the want of a better class of inhabitants in the locality to find them the employment necessary for their subsistence. WILLIAM HEY.

THE SMOKE NUISANCE.

SIR,—A prize is offered to free London from smoke; why falter, ye clever ones? This is no joke. Fair play this time, "be on the job"; no filching, no snubbing from official snob. The project is grand; give breath of life; end this unhealthy wasteful strife. The money is little, for small mercies give thanks; compete, men,—the remedy must come from the ranks. This work is ours, right straight in our line; high-salaried incompetents not in it this time.

R. T.

CONDITION OF FAREHAM.

SIR,—I will only ask you to make a short remark. The Fareham Local Board have made no further protest against the statements contained in my second communication which appeared in your issue of the 3rd ult., neither have they replied to the editorial remarks which appeared in the *Hampshire Telegraph*.

I hear on good authority that the Local Government Board have warned the Fareham Local Board that no further loan can be raised by the latter until the closet system is altered. Perhaps the Fareham Local Board are not aware that it has been declared by high legal authority that in such cases of wilfully permitting a public danger to exist they may severally be indicted for manslaughter should fatal results ensue. QUERTOR.

ROMAN VILLA, BRADING.

SIR,—Will you allow me to warn intending visitors to the Roman villa, Brading, that they had better, when paying their money at the turnstile, have an understanding what they may and what they may not see, as they may find themselves curtly shut out of the larger part, while others are admitted, indeed, pressed to go in, under their nose, as happened to me on Thursday last.

I would suggest to the gentlemen who have the matter in hand that if they cannot afford to keep a proper person there, it would be better to leave the whole in the charge of the old man who looks after the older or earlier-discovered portion. A. A. C.

CASE UNDER THE EMPLOYERS' LIABILITY ACT.

FARMAN *v.* JAVENS.

THE plaintiff in this case (which was tried before Mr. Besley, Q.C., in the City of London Court last week, and reported in the *City Press*) was W. Farman, a joiner, residing in Fordham-street, Whitechapel, and the defendant was Mr. J. M. Javens, grocers' fittings manufacturer, Halfmoon-street, Bishopsgate.

Mr. Grain (for the plaintiff) said that on June 29th defendant had completed a sugar shelf, 22 ft. long, 20 in. wide, and 4 in. thick, which was to be lowered from a second story. The ropes were fastened in the usual way, but in letting down the shelf, which was of unusual weight and size, it got caught in a projection from the first floor. His client was ordered by the foreman (named Davey) to go to the floor below and ease the shelf off. He was doing this when the rope was let go by a man named Parrett, who had charge of it, and the shelf swung back, jamming the plaintiff's hand against the rail, which resulted in a serious wound. He went to the hospital and had the wound dressed, but had been incapacitated for work ever since. He claimed 50*l.* damages.

Mr. Fulton (for the defendant) contended that his client had often had similar planks lowered, and there was nothing at all defective in the tackle. He should prove that the blame rested entirely with the plaintiff, who pushed out the plank before another man named Dollard could reach the basement, and Parrett was compelled to let go, which resulted in the accident.

Albert Davey, the foreman, stated that he instructed the plaintiff and Dollard to go below to ease the plank. He did not touch the rope.

John Parrett said he was holding the rope when the plank struck. At first he had the rope fastened, but he had to untie it, as it was too short for him to hold, and when the plank was swung out by plaintiff he was forced to let go.

The judge, in summing up the case, said it was important to give the utmost consideration to claims made by journeymen, as jurymen were supposed to sympathise with the masters rather than with the men—a theory he did not believe. If the jury were of opinion that plaintiff met with the accident while carrying out the instructions of the foreman, and it was owing to the rope held by Parrett being too short for the purpose, they would find a verdict for the plaintiff, but he would not advise them to award the extravagant sum of 50*l.*

The jury gave a verdict for the plaintiff,—damages, 10*l.*

FIRE IN THE MINE.

SIR,—Another mine on fire: the gas, exuding from millions of holes, cracks, and crevices, slowly fills the mine.

How easily and cheaply a remedy could be applied. A small fire-engine to squirt liquefied cement on the roofs and sides liberally; what falls on the ground would bind down the dangerous drifting coal-dust. This coating would prevent falls from the roof and sides by securing them, and every pore would be sealed for ages. R. T.

ASKING FOR WORK.

SIR,—In the *Surrey Advertiser* of September 24th, it is reported that the Clerk of the Guildford Local Board read a letter from Messrs. Gotto & Beesley volunteering their services as consulting engineers at a fee of thirty guineas, and inclosing testimonials. Considering they were not asked, is this quite the right sort of thing? C. E.

CHURCH-BUILDING NEWS.

Llantrissent.—Llantrissent Church, near Usk, has been re-opened, after restoration. The condition of the edifice previously to the recent works was very bad. The nave more particularly bore evidence of damp and dilapidation, and was full of square box pews, old and shabby, and in an exceedingly rotten and worn-out condition. The floors, being uneven and reeking with damp, have been taken up and relaid on solid beds of concrete, after many old vaults were properly repaired and made safe. The whole of the nave roof has had the barrel-plastered ceiling scraped down, and a fine sawn fourteenth-century oak roof exposed to view, the roof being composed of rafters, 6 in. by 6 in. and 18 in. apart from centre to centre, curved and braced. Upon breaking down the plaster barrel ceiling in the chancel, the old axed rafters were found to be so decayed that it was quite dangerous taking them off, and they could not have remained in their position many months longer. These have now been replaced by an open red-pine roof, with principal timbers showing, and the sides framed into panels, with V-jointed boarding, the whole stained and varnished. The square stone tower before the restoration was in a tolerably good state of repair, and, with the exception of pointing and re-setting the battlements on the top, and repairs to bell carriages, this has been untouched. Upon removing old pewing and plaster from the walls of the nave and chancel, an interesting piscina and mural stairs were found. The former has been carefully cleaned and exposed to view, but the latter, owing to some tablets which were not allowed to be removed being fixed in both arches to the same, has again been covered up. All the old stonework to the windows and arches has had the yellowish wash most carefully cleaned off, and the decayed portions made good with new stones, but in no case has any original moulding or splay been altered. The sun-dial was found in the tower, and this has been refixed in its former position over the south porch. The roofs throughout have been covered with Whitland Abbey slates. A new pulpit has been placed on the north side near the chancel arch. The nave has been filled with red pine open seats, with sloping backs, 3 ft. wide, book-boards, &c., these seats being upon a raised floor, with ventilation under the same, all the new woodwork being stained and varnished. The windows have been filled in with coloured cathedral glass, in quarry lights, with marginal borders. The whole of the alterations have been carried out for about 600*l.*, the contract being let to Mr. William Blackburne, builder, of Newport, who has carried out the work from plans prepared by Mr. Lansdowne, architect, of the same town.

High Tointon.—High Tointon Parish Church has been re-opened, after alterations and additions. The interior of the roof, which had been plastered, has been boarded, stained, and varnished. A reredos has also been erected by the vicar's wife in memory of her brother, who died last year at Milan whilst on a tour. It is executed in Ancaster stone, as regards that portion above the level of the Holy table. The lower portion is of red Mansfield stone. The emblems are in mottled Derbyshire alabaster, except the central one, the Agnus Dei, which is of pure white alabaster. In design, the reredos consists (1) of the central feature over the Holy table, which, in order to give it more emphasis, slightly projects beyond the wings, and is of richer character than the latter, and has an ornamental cresting over the cornice. In the centre is a circular panel, its mouldings enriched by pearls carved in the stone, and enclosing a sex-foiled cusped panel with *fleur-de-lis* points, in which stands the Agnus Dei. This panel is flanked by eight circular quatrefoil panels on either side, containing the following sacred emblems:—The Lily, Rose of Sharon, Dove holding Olive-branch, Star of Bethlehem, Passion Flower, Celestial Crown, Wheat, and the Grapes. (2) The wings of the reredos are each divided into three panels, which have square trefoil heads, instead of arched tops, in order to give as much space as possible for the Lord's Prayer, Creed, and Commandments, which are inscribed in legible Gothicised letters on yellow Mansfield stone panels, the lettering being tinted a deep chocolate. Between each panel in the upper part of the reredos is a carved boss in a circular panel. The lower portion of the reredos has been kept plain in design, with lozenge-shaped panels, somewhat having the effect of trellis-work, but to a larger scale. The reredos has been carried out and fixed by Messrs. White & Sons, of Vauxhall Bridge-road, London, from the designs of Mr. B. Edmund Ferrey, architect, London.

Delabole (Cornwall).—A new church, from the designs of Messrs. Hine & Odgers, architects, Plymouth, has recently been consecrated here by the Bishop of Truro. Of Early Geometrical design, it consists of nave, chancel, and south aisle, and seats 300 persons. Situated near to the celebrated slate quarries of Delabole, the walls are of that material, relieved by dressings of granite and Box-ground. The roofs are of steep pitch, and covered with local slate. They are open-timbered, of substantial construction. The chancel roof is enriched by carved angels. The various avenues are of slate, but the chancel floor is of encaustic tiling. The stalls, the lectern, and the chancel fittings are of oak. The font is of Beer stone. It was made by Mr. Harry Hems, of Exeter, who also made the lectern and did the general carving. The windows are glazed with cathedral glass. The contract has been carried out by Messrs. Westlake & Cann, of Camelford.

Plymouth.—Emmanuel Church, at Mannamead, a suburb of Plymouth, has just had a chancel and transepts added to its nave and aisles, which were erected eleven years ago. Messrs. Hine & Odgers, of Plymouth, have carried out the present works. The church is Late Decorated in style, and is well situated upon high ground. Its proportions are lofty. The walling is limestone, the dressings being of Portland and Box-ground. The windows are large, and well filled with tracery. They are glazed with cathedral glass. Mr. W. Morris, of London, is preparing a painted window for the east end, which is a five-light one. The roofs are of steep pitch, covered by slates, and surmounted by high wrought-iron crestings. The roof timbers are of pitch-pine. The chancel roof rests upon sculptured figures of angels in stone. The window labels are stopped by carved heads, and the rough blocks left in the first section have been carved during the present works. Mr. Harry Hems has executed this carving from the architects' designs. The chancel rises three steps from the nave floor. It is laid with Maw's encaustic tiles. The brass gasfittings are by Messrs. Hart, Son, & Peard, of London. The seating generally is of pitch-pine. The chancel stalls are of carved oak and pitch-pine. The pulpit is of oak, and the lectern is of brass. The church is heated by hot air. The builder was Mr. Blowey, of Buckland. The Bishop of Exeter consecrated the church. It is hoped at an early date to erect a south-west spire, 150 ft. high, at a further cost of 1,700*l.*

Birmingham.—The Church of St. Nicolas, Lower Tower-street, Summer-lane, which has been repaired and redecorated, has been re-opened. The church has undergone considerable alteration. New seats of English oak have been placed in the chancel, and the chancel itself has been extended farther into the nave, and enclosed with a low freestone all inlaid with marble panels. A screen, which is of a Gothic design, rests upon this, extend the whole width of the chancel, and rises to a height of about 20 ft. The western screen has been continued across the south aisle. The church has been re-decorated by Messrs. J. R. Lee & Co., of Ann-street. The decorations consist chiefly of bands and pattern-work, stencilled on a greenish-grey ground. The plastering between the rafters of the nave has been finished in a salmon colour, and that between the aisles and chancel-rafters has been coloured a bluish-grey. Texts have been written upon the walls, and the spandrels of the nave arcade and of the windows have been filled in with stencilled pattern work in Indian and Venetian red and black. A painted head of St. Nicolas has been introduced in a circular panel over a recess in the chancel, and the east window has been partly filled in with stained glass, by Messrs. Camm Brothers, the design representing the Crucifixion. The structural alterations have been executed by Messrs. C. Jones & Son, of Belmont-row; and the whole of the work has been carried out from the designs of Mr. John Cotton, architect, of Temple-row.

Knutsford.—The new Church of St. Cross, Knutsford, was consecrated on the 14th ult. It replaces the church built on the same site at the sole expense of the late Mr. Peter Leigh, of Norbury Booths Hall, Knutsford. Though consecrated as lately as February, 1858, it was (according to the *Warrington Guardian*) found necessary in the spring of 1879 to transfer the services to the village school, as the then existing church was pronounced by several firms of architects to be in a most dangerous condition, owing to the breaking of the roof, and the consequent outward thrust of both side walls. The designs of the edifice just erected were prepared by Messrs. Paley & Austin, architects, Lancaster, and the contractor was Mr. Hamilton, of Altrincham. The cost has been 4,000*l.* The building, which is composed of brick and terra cotta, supplied by the Knutsford Brick and Tile Company, consists of nave, transepts, chancel, tower, vestries, and porch. Its total length is 120 ft., being 18 ft. longer than its predecessor. The width of the nave is 23 ft.; of the transept across the nave, 52 ft.; and of the chancel between the side chapel and the organ, 24 ft. The pitch of the roof of the nave is 36 ft. from the floor line; and the tower, 81 ft. in height, is fitted to carry a full peal of bells, with ringers' room, &c. The chancel is separated from the nave by a metal screen, with gates. It contains fifty-five seats for the exclusive use of the choir, with two prayer-desks. The organ-chamber is on the south side of the chancel, and on the north side of the small chapel, which, along with the north transept already mentioned, is used by the children of the school at the morning services. Eastward of the chancel is the sacrarium, with sedilia, credence-table, and the altar, standing under a five-light tracery window, filled in with stained glass. The pews are of pine. The floor of the chancel is laid with ornamental encaustic tiles. Several special gifts have been made to the church. The five-light east window has been filled in with stained glass illustrative of various incidents in the life of Christ, at the sole expense of Major Hill, one of the churchwardens, in remembrance of his parents and sister. The window was furnished

by Mr. Forrest, of Liverpool. An alabaster font, made by Mr. Roddis, of Birmingham, was the gift of Mr. and Mrs. M. M. Speakman, of Knutsford. Mr. W. Jones, J.P., of the Grange, Knutsford, contributed a carved oak pulpit, which rests on a white stone pedestal. The reredos has its central part composed chiefly of wood, carved by Mr. F. Armitage, of Bowden, and given by Mr. B. Gibbons, of Knutsford.

Stourport.—The erection of a new church, from designs prepared by the late Sir Gilbert Scott, at a cost exceeding 30,000*l.*, has been commenced at Stourport. The cost will be principally defrayed through the munificence of the vicar.

Sunderland.—St. Bede's Mission Church has been re-opened, after alterations. The platform which did duty as a pulpit has been removed, and the recess forms a chancel, the window having been filled with painted glass, by Barnett, of Newcastle, the subject being the Good Shepherd. A new pulpit, prayer-desk, and lectern, and an American organ, have been supplied. The exterior has also undergone a change, a belfry having been erected, surmounted with a stone cross. The alterations have been executed under the direction of Mr. M. Greener, architect, Sunderland.

STAINED GLASS.

Halifax.—A two-light stained-glass window has been erected in the north aisle of the old parish church of Halifax by the officers of the 33rd (Duke of Wellington's) Regiment, as a memorial to four of its late officers deceased during service, viz.,—Major A. J. Weeding, Captain E. S. Wason, Lieut. R. S. P. Robinson, and 2nd Lieut. J. B. H. Carmichael, the two last killed by the landslip at Naini Tal, India, September 18th, 1880. The subjects (from Acts x.) are :—(1.) The angel appearing to Cornelius; (2.) Peter visiting and raising the kneeling Cornelius. Each subject group is surmounted by a canopy. The window and tracery are of severe fifteenth-century style. In the bases of the lights are respectively the crests of the Duke of Wellington and of the regiment. A surrounding riband bears the names of the battles inscribed on the regimental flag. The window, by Messrs. Powell Bros., Leeds and London, was erected under the superintendence of Mr. Jackson, architect, Halifax.——In St. John's Wesleyan Chapel, a two-light window, which is dedicated to the memory of Annie, wife of Mr. Henry Edmunds, junior, has just been completed. This window has also issued from the studio of Messrs. Powell Bros. An allegorical figure of "Faith" occupies one light, and another of "Hope" the respondent light. The former is partly supported by a staff, cross crowned (emblematic of the Gospel Word); the latter rests her right hand on the emblem anchor that entereth within the veil. Each stands in front of a shoulder-high white and gold diapered screen, beneath a richly-carved canopy. The ornamented tracery, canopies, and bordures are in fifteenth-century style. The erection of the window was under the superintendence of the architect, Mr. W. Swinden Barber, of Halifax.

Westerdale (Yorkshire).—A two-light window, dedicated to the memory of the late Col. the Hon. Octavius Duncombe, lord of the manor of Westerdale, and for twenty-five years M.P. for the North Riding of the county of York, has been unveiled. The window is in the nave. Each light is divided into two compartments by decorated bordures, allowing of the introduction of four groups, illustrating respectively the Nativity of Christ, his Baptism in Jordan, Crucifixion, and Ascension. The window is from the studio of Messrs. Powell Bros., Leeds, Mr. H. Perkin, of Leeds, being the superintending architect. ——At the same time was unveiled another and smaller painted window, over an entrance-porch, of which the subject is "Christ blessing little Children," dedicated to the memory of two infant children of the Rev. John Rathbone Ellis (the rector), interred at St. Asaph. This window is also by Messrs. Powell Bros.

Edinburgh.—The large central window situated in the south wall of the Preston aisle of St. Giles's Cathedral has been filled with stained glass, the design being illustrative of the life of St. Paul. The window is of large proportions, measuring fully 25 ft. in height by 12 ft. in width, and consists of ten compartments, in addition to the flowing tracery above. The two conspicuous events in the life of St. Paul are depicted,—his Conversion on the way to Damascus, and his Preaching at Athens. The upper panels are devoted to the former, and the lower panels to the latter. The whole work has been designed and executed by Messrs. Ballantine, under the honorary superintendence of Mr. Robert Herdman, R.S.A., and the St. Giles's Restoration Committee. The window is the eleventh of the series of completed windows. The memorial is inscribed, "In memory of Duncan Monteith, merchant, Calcutta, born at Thornhill, 1812; died at Edinburgh, 1879; erected by his daughters, Margaret, Agnes, and Sibla, 1881."

London.—A window of painted glass has just been erected from the design of Mr. Burne Jones in St. Peter's Church, Vere-street, Oxford-street. It occupies the whole east end of the chancel. The central group represents our Saviour conversing with the woman of Samaria.

Newbury.—The new window which has been provided from the funds of the St. Nicholas Stained-glass Window Society, and which is one of a series it is proposed to insert, has been filled in in the south aisle of the parish church, by Messrs. Hardman & Co., of Birmingham. It consists of four lights and tracery. The subjects chosen for illustration are taken from the parables of our Lord. In the first or dexter light is depicted the parable of the Pharisee and the Publican; in the two middle lights that of the Wise and Foolish Virgins; and in the fourth or sinister light the Return of the Prodigal Son.

Kidderminster.—A stained-glass window has been placed in the north transept of St. John's Church, Kiddermiuster, by Mr. W. J. Wyley, in memory of the late Mr. Joseph Kitley. It is a three-light window, and represents scenes in the life of Daniel, the prophet. In the first light Daniel is represented as interpreting the King's dream; in the second he is occupying the position of the president of the council; and in the third he is on his knees, praying. The window has been supplied by Mr. John Davies, Wyle Cop, Shrewsbury.

Miscellanea.

Proceedings at the Clerkenwell Vestry.—At the last meeting of the Clerkenwell Vestry, held on the 23rd ult., two hours were spent in a somewhat acrimonious discussion arising out of a motion for the acceptance of a tender, amounting to 48*l.*, for some carpenters' work. The motion was to the effect that the tender should be accepted "on condition that no commission be paid to Mr. ——"(one of the Vestrymen being named). The member referred to made an explanation denying that he had ever received commission from contractors on work done for the Vestry, and ultimately the subject was referred to a committee of the whole Board. The next business was the appointment of an assistant in the Surveyor's office. Six candidates had been chosen by a committee deputed to examine their drawings, testimonials, &c., and these candidates duly appeared at the vestry meeting, expecting that one of them would be elected to fill the vacancy. But, we are informed, nothing of the sort took place. The assembled vestrymen voted for a candidate not included among the six recommended by the committee. As soon as the voting was over, a member asked whether it was true that the chosen candidate had been introduced to many vestrymen by the Surveyor during the week? This query was met by cries of "Too late!" Nevertheless, some explanation appears to be needed.

An Abstracted Picture.—A mysterious affair, recalling the strange disappearance of the Gainsborough picture some years ago, is now being investigated by the Scotland-yard authorities. The picture known as the "Monarch of the Meadows," painted by Mr. T. Sydney Cooper, R.A., and the property of Mr. Allcroft, M.P., of Lancaster-gate, Hyde Park, has been destroyed or stolen. On the morning of the 13th inst. a room in Mr. Allcroft's house, in which the picture was standing during the general repair of the building, was discovered to be in flames. The Fire Brigade were at once summoned, and the fire was rapidly got under. On examination it was found that the picture had been cut out of the frame either before or after the fire had commenced. The police were at once communicated with, and the most searching investigation is being made into the matter. The surprising part of the affair is the fact that no traces are to be found of an entrance to the house having been obtained. The painting was valued at 5,000*l.*

Hull and Barnsley Railway.—The works of the dock in course of construction in connexion with this line have made great progress during the last few weeks. The river embankment is being rapidly raised, and in some parts is only 5 ft. below high-water mark. As many as fifty cargoes of chalk are discharged every week. A great part of this material is brought from the quarry of Messrs. Lucas & Aird, at Barton; but the progress made is so rapid that at present they find their own quarry will not supply all the chalk required, and much is also obtained from other sources. A large cofferdam which will contain about 1,500 piles, and which is being constructed in front of the entrance, is being pushed with all vigour. Preparations are being made for continuous work, night and day, and in a few days there will be two powerful electric lights in use, and these will enable the work to proceed continuously. A powerful double dredger is at work removing the Hebbles Shoal from the entrance, and the material dredged is carried in iron hopper barges behind the chalk embankment, and assists in filling up the quays. The concrete foundations of the north wall of the dock are being laid, and upwards of 150,000 cubic feet of stone have been deposited on the work, so that, when once commenced, the masonry of the dock-walls will progress without any delay whatever. It is expected that the foundations will be ready, and the first stone laid, in a few weeks. The stone is all brought from the fine quarries near Leeds and Harrogate, and is of the hardest description. All the bridges are now built between Spring-bank and the Beverley-road, so there will be nothing to delay the progress of the embankment. The bridge over the Beverley-road will be commenced almost immediately on the east side of the river Hull. A start has been made on the bridge and viaduct over the Sutton Drain.—*Engineer.*

The Retabulum in Westminster Abbey.—"H. P." writes to *Notes and Queries*:—"Who was the first discoverer of the retabulum which is now exhibited at the back of the sedilia in Westminster Abbey? I forestall this query, to which, otherwise, your valuable columns would at some future day be subject. I also forestall the reply, because I think I have the true one, and because I think it ought not to be delayed." He goes on to show that the credit has been given to the late Mr. Blore, on the strength of a printed paper left by Mr. Willement, and then continues,—"I have lately come across another paper on the same subject, dated thirty-four years before that of Mr. Willement. This paper is dated July 19, 1817; it is by Mr. John Carter, F.S.A., draughtsman and architect, a frequent contributor to the *Gentleman's Magazine*. This paper was the last but one that he wrote, for he died, aged sixty-nine, on the 8th of the following September. After commending the waxen portrait and dress of King Charles II.'s effigy, he says:—

"In a box inclosing other Royal wax figures in Islip's chantry, has been substituted, by way of covering, some compartmented work of small mosaic ornamental carvings and paintings of figures, of a design so delicate, an execution so exquisite, that an absolute view alone of the same, and that with the utmost attention, can give the least idea thereof. No hesitation need be made, when it is affirmed, that it must have been a small portion of the highly estimated shrines that once rendered the scenic display of the interior of the pile so shining and glorious!"

Messrs. Thomas & Sons' Lifts.—Sir E. J. Reed, M.P., has been visiting Cardiff to inspect the Exhibition there. After leaving the Drill-hall, the member for the united boroughs proceeded to the Acme Hoist Works, Penarth-road, recently erected by Messrs. Thomas & Sons. He made a survey of the works, but was more especially interested in the specialities which were shown to him in self-sustaining hoisting machinery. Of these he spoke in terms of approval, foretelling to Messrs. Thomas & Sons a bright future for their new arrangements in a useful branch of engineering.

Cheap Literature. — The publication by Messrs. Longmans, Green, & Co., of Lady Brassey's bright, breezy, and popular "Voyage in the Sunbeam" at the price of *sixpence* marks the commencement of an era. It is clearly printed and fully illustrated, and will doubtless penetrate far and wide throughout the kingdom, to be read with pleasure and profit by all classes.

Stamford Priory.—Mr. C. Kains-Jackson writes to say that the threatened desecration of Stamford Priory has been definitely averted, the scheme of turning it into a cart hovel being altogether abandoned.

"The Caravanserai."—Mr. Alsager H. Hill sends us the prospectus of what, as it seems to us, might be made a useful institution. The proposal is to establish in London, in direct connexion with the Central Labour Exchange, "The Caravanserai and Travellers' Rest." The situation selected will be as central as can be secured. At the present time large numbers of workmen, more especially those fresh from the country, find no immediate resort but the common lodging-house, with no facilities for obtaining the necessary information and guidance in their search for work. Apart from the sleeping accommodation, which will be at least equal to the best afforded by the ordinary lodging-house, the "Caravanserai" will, as a special feature, through a reading-room and Labour Exchange attached thereto, supply all the leading facts of the labour market from day to day, and arrangements will be made for employers forwarding to the establishment any special or sudden demand for hands. For the intending emigrant as well as to the stranger settling in London, special information will also be afforded under the auspices of the Central Emigration Agency. The establishment will be on a strictly commercial basis, and only such rules as are necessary to insure discipline and good order will be enforced on the premises. Every facility will be given for employer and employed to meet on the premises. We understand there is something of the kind at Leeds which works well.

Fall of a Church Tower.—The old tower of the church of St. Helen, at the village of West Keal, near Spilsby, Lincolnshire, fell with a crash on Sunday, the 18th ult. Shortly before eleven o'clock, the rector, the Rev. J. S. Ladds, while in the edifice, before the commencement of the morning service, was alarmed by some portions of stonework falling, and ominous sounds proceeding from the tower. Quitting the edifice, others were warned of the approaching danger, and not long afrer the tower showed widened clefts or breaches in its walls, visibly shook, tottered, and fell *en masse*, but, fortunately, without hurt to any one. Nearly the whole of the tower fell to the south in the churchyard, clear of the edifice, with some portions bulging off north and west. The tower was built principally of sandstone, and was one of the most ancient in the neighbourhood. Latterly, from its patched appearance, with brickwork, &c., from repeated repairs, it has presented a very unstable appearance, and ugly fissures were apparent in its walls. The *Lincolnshire Chronicle* says that the heap of ruins show the tower to have fallen from thorough natural decay. The church itself was new roofed in 1853, re-seated in 1865, and the chancel rebuilt in 1867, together with its quaint stone-roofed porch, which is still standing.

A Monster Crane.—One of the largest cranes of its kind has just been manufactured for Mr. J. Dickinson, Sunderland, intended for the Quayside. Messrs. F. & J. Butterfield, Keighley, are the manufacturers of the crane, which will cost, including fixing, about 30,000*l*. It is constructed of wrought iron, mounted on four carriages, each having four runners 3 ft. in diameter. A cast-iron wheel rack is fixed in the centre of the foundation, 25 ft. in diameter, a circular-rack 6¼ pitch being fixed upon it for moving the crane. The length of the jib is 71 ft., and it has a lift of 90 ft., with a staging on the top for a man to stand on. The chain is passed over wrought-iron capped drums, 14¾ in. diameter, milled out to suit the chain, which is 1⅜ in. diameter, five teeth to fit into the links of the chain being fixed on the drum. The crane is geared for twelve, twenty-five, and fifty tons respectively.

Circumlocution in India.—The *Bombay Gazette* says that if a chimney smokes in a barrack at Rangoon the difficulty is encountered as follows:—The officer commanding the troops who occupy the building refers the matter to the proper staff officer, whoever he may be; he communicates with the military staff at Madras; and the commander-in-chief of that Presidency brings the question to the notice of the local Government. The Government of Madras then addresses the Government of India at Simla, and the papers on the subject travel about that pleasant station for a while in boxes. There a despatch is prepared, and finally sent to the Chief Commissioner of British Burmah, who sets the machinery of his administration in motion, and then the officer in charge of military works at Rangoon sends for a mistree, and the chimney is set to rights.

University College, Bristol.—The calendar for the sixth session of University College, Bristol, has just been received. It shows a course of lectures extending over all, or nearly all, the chief branches of a liberal and scientific education. Special attention has been paid to the chemical and engineering departments. Each of them in its own way combines theoretical with practical instruction. In the former, laboratory work, both in the day and evening, supplements the instruction given by general and technical lectures. And in connexion with the latter, arrangements are made by which students attend lectures at the College during the six winter months of the year, and gain their practical experience during the summer months, when they work as articled pupils in the offices and workshops of leading engineering firms of the neighbourhood. The instruction in experimental physics is kept abreast of the rapidly-increasing requirements of the age; and in this subject, as well as in geology, special provision is made for the wants of the engineering students. The growth of Bristol in moral, mental, and material wealth must be much promoted by an institution which gives, as this does, instruction to over 500 men and women. It is to be regretted that the College has no foundation.

Proposed Theatre for Yokohama.—An endeavour is being made to provide Yokohama with a new theatre and public hall. It is proposed, according to the *Japan Weekly Mail*, to start a Public Hall Company, with a capital of $20,000, in 400 shares of $50 each. An active Provisional Committee (composed of Messrs. Ahrens, Bridgford, Emory, Enslie, Fitz-Henry, Fobes, Griffin, Herbert, Rice, and Townley) has been for some time at work over the preliminaries, and it is believed that their efforts to float the scheme will be crowned with success. The Choral and Dramatic Societies have subscribed the sum of $1,000. It is calculated that a building capable of holding 500 persons can be erected in brick and iron, with all internal fittings and furniture complete, for $15,000. Including the purchase of a suitable plot of ground, the sum of $20,000 will be ample for all purposes.

Art at Cardiff.—The fine-art and industrial exhibition at Cardiff, which has been open for the past two months, and has been visited by some 120,000 persons, was brought to a close on Wednesday last. By this exhibition about 3,000*l*. has been raised towards the furnishing and decoration of the local museum and science and art schools and the formation of an art gallery in the town. Sir E. J. Reed, who attended a dinner given to the executive committee of the exhibition a few days ago, then and there presented, as a contribution to the art gallery, Vicat Cole's landscape entitled "Noon," which, while on loan in the exhibition just closed, has been greatly admired by the visitors. The Mayor, in acknowledging this handsome gift, said that its value was 1,000 guineas. It was exhibited at the Royal Academy in 1873.

Congregational Chapel Building.—The builders in the metropolis, according to our contemporary, the *City Press*, have a bright prospect before them so far as regards the erection of places of public worship, seeing that the Congregationalists estimate that they must build eighteen chapels yearly, each capable of holding 1,000 people, even to maintain their present position proportionately to the population. Most other denominations have doubtless to face the same problem, and as some of them have in addition leeway to make up, the erection of new ecclesiastical edifices in London promises to continue.

The Building Trades in Melbourne.—The Melbourne correspondent of the *Times*, writing on August 15th, says,—"A very large number of houses are now in course of erection in Melbourne and the suburbs, and no artisan connected with the building trades need be out of employ if able and willing to work. The demand for bricks so exceeds the supply that orders remain unexecuted for weeks."

Brighton Sanitary Exhibition.—The executive committee have decided to hold a health congress in connexion with the projected sanitary and scientific exhibition at Brighton in December next. The Pavilion committee resolved on Monday to recommend the Town Council to grant the promoters the free use of the whole of the Pavilion buildings.

A Fine-Art Exhibition at Leicester has been opened this week. The pictures number 256.

Open Areas in the Rear of Dwelling-houses in the Metropolis.—At the last meeting of the Lambeth Vestry, Mr. Symons inquired whether it was intended by the Metropolitan Board of Works to obtain an alteration in the Building Act, so as to prevent the backs of houses being built so close together. He also wished to know whether Mr. Fowler, a representative of the Vestry at the Board, would direct the attention of the board to the alleged failure of justice in the case of houses being commenced before action could be taken to prevent their erection. In reply, Mr. Fowler said the Building Act Committee of the Metropolitan Board had before them a book in which anything which appeared to require emendation in the Act was entered. These alterations would no doubt be included—certainly the important question of increasing the area at the backs of houses.

Ecclesiastical Art Exhibition, Newcastle-on-Tyne—Concurrently with the Church Congress at Newcastle-on-Tyne there will be opened on Monday, the 3rd of October, an Exhibition of Ecclesiastical Art, under the same management as in previous years. The Exhibition will be held at the Auction Rooms, Pilgrim-street. Most of the leading church furnishers are exhibitors, and there is, in addition, a loan collection. Perhaps no one single subject is so thoroughly illustrated as that embraced by Mr. Bragge's collection of 124 Russo-Greek "Icons," or religious pictures, which are so frequently met with in Russia.

The New Corn Exchange Buildings in Sheffield, which cover an area of about 1,500 square yards, and which are now on the eve of completion, were inspected on the 26th ult. by the proprietor, the Duke of Norfolk, lord of the manor. Messrs. Hadfield & Son are the architects. We shall illustrate the new buildings fully before long.

Election of Borough Engineer for Leeds.—A special meeting of the Leeds town council was held on the 22nd ult. for the purpose of appointing a borough engineer, at a salary of 600*l*. a year. There were eighty applications for the post, which has been conferred upon Mr. Thomas Hewson, borough surveyor of Rochdale.

Adelaide Exhibition.—We hear with pleasure that "the gold medal of the Adelaide Exhibition has been awarded to Mr. George Jennings,"—we conclude, for his various important improvements in sanitary appliances and his inventions.

Charing-cross Hospital.—The new school buildings here are to be the scene of a *conversazione* on Monday, the 3rd. Invitations have been sent out by the medical officers and lecturers.

TENDERS

For the erection of additional schools, &c., for the accommodation of about 500 children, in the Banstead-road, Sutton, Surrey, for the Managers of the South Metropolitan School District. Mr. William Wallen, architect. Quantities by Messrs. Franklin & Andrews:—

W. D. Macgregor, London	£109,815 0 0
Jno. Tyerman, London	95,289 0 0
Albert Kimberley, Banbury	94,276 0 0
D. C. Jones & Co., Gloucester	92,817 0 0
Wm. Shepherd, London	91,650 0 0
Fred. Higgs, London	90,750 0 0
Wm. Saurmur, London	88,904 0 0
Jno. Mowlem & Co., London	85,857 0 0
Higgs & Hill, London	85,844 0 0
T. Rider & Son, London	84,888 0 0
Wm. Tongue, London	84,255 0 0
Perry & Co., London	83,949 0 0
Jno. T. Chappell, London	83,809 0 0
C. E. Nightingale, London	83,383 0 0
Jas. Longley, Worth, Sussex	83,846 0 0
W. J. Adcock, Dover	82,704 0 0
W. Crockett, Epsom	82,695 0 0
Jno. Marsland, London	82,473 0 0
T. Boyce, London	82,443 0 0
Paramor & Son, Margate	82,350 0 0
Geo. Shaw, London	81,510 0 0
Martin, Wells, & Co., Aldershot	80,700 0 0
W. J. Beale, London	80,664 0 0
H. F. Hart, London	79,739 0 0
Kirk & Randall, London	78,872 0 0

For new warehouse, Lower Thames-street. Mr. E. N. Clifton, architect:—

Macey	£25,324 0 0
Cooke & Co.	24,982 0 0
Morter	23,341 0 0
Lawrence	23,335 0 0
Ashby & Horner	23,500 0 0
Conder	23,199 0 0
Holland & Hannen	22,233 0 0
Peto, Bros.	22,151 0 0
Brass	21,937 0 0

For the ornamentation of the Royal Avenue Theatre in carton-Pierre, and the decorations of the interior, for Mr. Sefton Parry. Messrs. Fowler & Hill, architects:—

J. M. Bookbinder (accepted).

For the erection of a block of school buildings and appurtenances on a site at Salway-place, Stratford, Essex, for the West Ham School Board. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

W. Gregar	£7,734 0 0
R. F. Nightingale (too late)	7,373 0 0
R. Abrahams	7,195 0 0
T. Boyce	7,180 0 0
North, Bros.	7,150 0 0
Wall, Bros.	6,976 0 0
A. Reed	6,965 0 0
G. Hoskings	6,883 0 0
F. & F. G. Wood	6,795 0 0
J. Morter	6,747 0 0
Hearle & Son	6,683 0 0

Accommodation, 904 children. Cost per child, 7l. 10s.

For alterations, &c. to the Raglan Hotel and Tavern, No. 61, St. Martin's-le-Grand, for Mr. T. Young, Mr. Edward Power, architect:—

Pitcher & Son	£592 0 0
R. Conder	539 0 0
G. Shaw	460 0 0
Hayward & Son	447 0 0
Spencer & Co. (accepted)	415 0 0

For new mortuary, &c., Church-street, Stoke Newington. Mr. J. Douglass Mathews, architect. Quantities supplied:—

Goodall	£684 0 0
Boyce	640 0 0
Ashby, Bros.	559 0 0
Faulkner	557 0 0
Grover	498 0 0
Roberts	492 0 0
Shurmur	477 0 0
Harper	473 0 0
Sharp & Mills	450 0 0

For mission-hall, The Grove, Crouch End. Mr. J. Farrer, architect. Quantities supplied:—

Southcott & Co.	£849 0 0
R. Conder	789 0 0
Harper	743 0 0
Macfarlane	731 0 0
Richards & Jenkinson	695 18 6
J. S. King (accepted)	645 0 0

For drying-factory at Stratford, for Messrs. Jeune & Co. Mr. A. Bradley Rooke, architect. Quantities supplied:—

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Smith	2,560 0 0
Salt	2,428 0 0
Mattock, Bros.	2,379 0 0
Tongue	2,270 0 0
Jones & Co.	2,187 0 0

For making Epirus and Tournay roads, Walham-green, including sewers, for the Middlesex Land Company. Mr. George Edwards, surveyor:—

Pizzey	£3,200 0 0 !
Mowlem & Co.	2,200 0 0
Keeble	1,824 0 0
Nowell & Robson	1,550 0 0
Neave & Son	1,547 0 0
Carter	1,539 0 0
Mears	1,520 0 0
Killingback	1,520 0 0
Martin, Wells, & Co.	1,500 0 0
Long	1,281 10 6
Green (accepted)	1,256 0 0 !

For the erection of a pair of semi-detached residences, on the Eston-road, Coventry, for Messrs. Beamish & Loudon. Mr. William Tomlinson, architect:—

G. J. & J. Fox, Atherstone	£3,693 0 0
J. Worwood, Coventry	3,289 0 0
H. Price, Coventry	3,222 0 0
Hallam & Co., Coventry	2,950 0 0
Smith & Son, Kenilworth	2 840 0 0
Chas. Haywood, jun., Coventry *	2,575 0 0
Jos. Makepeace, Coventry	2,550 0 0

* Accepted for slightly revised scheme.

For veterinary stabling, &c., Nottingham, for Mr. J. P. Ford. Messrs. S. Dutton Walker & Howitt, architects:—

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Jelley	479 0 0
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Vickers	447 0 0
Lynam	434 0 0
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Lamble	1,165 0 0
Eyles	1,159 0 0
Wescombe	1,142 0 0
Mansell	1,130 0 0
Chamberlain	1,119 0 0
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For Halsey Villas, Woodford. Mr. E. Egan, architect:—

Masters	£1,507 0 0
Egan	1,488 0 0
Wells	1,457 0 0
North, Bros.	1,450 0 0
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Wood	1,425 0 0

For pair of villa residences, Hillside, St. Albans, for Mr. Wells. Messrs. J. & F. Clarkson, architects:—

J. S. King, Hornsey	£2,350 0 0
Staines & Sons	2,234 0 0
Savage	1,993 0 0
White, Dunstable	1,990 0 0
Capper	1,690 0 0
Ede & Son, St. Neot's	1,561 0 0
Shoal & Co.	1,555 0 0

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Marriage, Croydon	£2,820 0 0
Hoare & Son, Blackfriars-road *	2,631 0 0

* Accepted subject to certain alterations.

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T. Potterton (accepted).

For the erection of a pair of model cottages on the Essex Estate, Pentlow, Essex, for the Society for the Propagation of the Gospel:—

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The New Egyptian Rooms in the British Museum.



THE removal of the splendid collections of mineralogical and palæontological specimens from the British Museum buildings at Bloomsbury to the new edifice which is designated the "British Museum (Natural History)" at South Kensington, liberated a large superficies of floor and wall space at the former building. This enabled the authorities at once to take steps for the commencement of the new system of arrangement of antiquities which, when complete, will comprehend not only all the antiquarian relics in the Museum, but those also which are still preserved at the Christy Museum in Victoria-street. The whole of the northern gallery has thus been apportioned to new undertakings. The Egyptian and Assyrian studies are now placed more commodiously at the north-west corners; then comes a room, which formerly held the palæontological relics, now devoted to a display of Etruscan sarcophagi, terra-cottas, and fictilia, of which we hope to give an account at some future time; then more to the eastward, two large rooms, filled with the collection of the smaller Egyptian objects; these rooms are bounded to the east by temporary zoological studies, and at the extreme eastern corner by a refreshment-room. The larger and heavier objects of Egyptian history and art, that is, the stone remains and some cases of statuettes and architectural fragments, remain in the Egyptian gallery on the ground floor.

It is of the contents of these two new Egyptian rooms in the northern gallery that it is proposed to point out, on the present occasion, some of the salient points of arrangement and intrinsic interest. These Egyptian antiquities have been principally acquired from collectors or by purchases at public sales. The principal of these acquisitions are the collection of the well-known traveller, Mr. Salt, purchased by the trustees in 1821; a smaller collection of choice objects presented by the late Sir J. Gardner Wilkinson, in 1834; purchases selected at the sale of the Barker collection in 1835, and of the Sams' collection in the same year; the sale of the objects brought to England by the equally celebrated African traveller, Mr. Burton, in 1836; of Signor Anastasi in 1839, and again in 1857; of the Oriental writer, Mr. Lane, in 1842, and of the Earl of Belmore in 1843; a selection of the extensive Hay collection, gathered by Mr. Robert Hay, of Linplum, N.B., during his private but important expedition to Egypt and Nubia, about the year 1826, in company with several artists and antiquaries; and numerous antiquities of a very miscellaneous but not less valuable character purchased and presented by the Rev. Greville Chester, a not unfrequent sojourner in the land watered by the Nile.

In the arrangement of the two rooms which hold all these invaluable relics an instructive classification has been adopted. The first or westernmost room, which is entered by the visitor by turning to the left, immediately on reaching the head of the north-east staircase, situate at the end of the Egyptian gallery on the ground-floor, comprises objects of religious, military, and domestic life, while the second, or inner room, more to the eastward, is devoted to the vast number of relics connected with the dead. Thus we are enabled to see, almost at a glance, the two great phases of evolution which Egyptian art embraced,—national products and necessities of a progressing civilisation in the one room, the bias of funereal *cultus*, and the whole sepulchral art in the other. Great diversity of opinion still prevails, and we fear is likely to prevail, on the subject of Egyptian chronology; indeed, to so impracticable a deadlock have the lucubrations of some writers reduced the chronology of Egyptian history that the most prominent Egyptologists, both in England and abroad, have abandoned this branch of study to lecturers and dilettanti, and directed their attention more to the elucidation of the philological aspects of the language and literature, and to the decipherment of inscriptions and papyri, than to the strict arrangement of reigns, and to the confused pedigrees of the ancient members of the dynastic families. Hence, throughout the collection in the British Museum, wisely, no attempt is made to assign the older objects to a fixed date, but only to the intervals of time marked by the dynasties which successively reigned over Egypt. The locality, however, from which the individual objects come, has been indicated, if known, upon a descriptive label.

Taking the cases in the first room, in order of their numeration, Nos. 1–12 are filled with the objects of the Pantheon or Religious World,—sacred figures of gods and animals. In this section the silver and bronze objects are principally votive offerings which have been attached to the walls of temples and found under the pavements; the hard stone objects are either pendants of necklaces,—a favourite personal ornament with the race,—or small votive figures; the porcelain objects come from the networks with which mummies have been enveloped, or from necklaces clasped around the necks of the departed, these being selected and incorporated into the Pantheon without reference to the purpose to which they were applied, but simply as illustrating the religious cult of the nation. The religions consisted of an extensive polytheism represented by a series of local triad groups. The idea of a single deity, self-existing or self-produced, was involved in the conception of some of the principal gods who are said to have given birth to or produced inferior gods, men, all beings, and all things. Some of the deities were considered to be self-produced. The Sun was the older object of worship, here, as in many other countries; and, as the rising, midday, or setting orb, was invested with different names and propitiated with varying forms of reverence. But the oldest of all the local deities was the Memphian Ptah, the demiurgos or creator of the heavens, earth, gods, and men, and not identified with the sun. Besides the worship of the solar gods, that of Osiris prevailed extensively, and with it, the antagonism of Set, the Egyptian Satan; and the tenets of a transmigration of the soul, a future judgment, purgatory or Hades, the *karneter* or hall of the gods, the *Aahlu*, or elysian fields, and final reunion of soul to body after the lapse of æons, all find illustration in the objects of this class. And, as in other mythological systems, besides the deities of heaven, the light, and the lower world, other inferior personages presided over the elements and operations of nature, the seasons, and events. Most, however, of the important gods were solar, representing various epochs in the path of that luminary either above or below the earth. It is interesting also to note the triadic grouping of deities according to their locality. Thus, at Memphis the triad consisted of Ptah, his consort Merienptah, and their son Nefer Tam; at Abydos, Osiris, Isis, and Horus, with Nephthys sometimes added; at Thebes, Amen-Ra or Ammon, Mut, and Chons, with Neith occasionally added, and so on. When these religions grew debased from admixture of foreign myths, Bel or Baal, Astarte, Ken, and Respu, were adopted from Semitic sources. At this later time, too, a triple classification of gods seems to have been admitted. Some of the types of the Pantheon are wanting, and some are exceedingly rare; but the British Museum collection will contrast favourably with those at Paris, Berlin, Turin, Boulaq, and other national museums. The nature of the material used for different deities is very instructive: thus Osiris is usually in bronze, very rarely in porcelain; Shu, the Egyptian Hercules, and Taur, the wife of Typhon, a mystical goddess, composed of the hippopotamus, crocodile, and lion, are, on the other hand, rarely, if ever, found in bronze. The silver figure of Amen-Ra, as a man, walking, and formerly covered with thick gold leaf,—a Theban relic,—is of great value and rarity; the golden figure of Chons, seated with the moon's disk on his head, and the golden Athor, the celestial mother, with the sun's disk, another Theban treasure, are worthy of especial admiration in this class. The bronzes are very numerous, and there are four interesting porcelain figures of "Ptah-Socharis-Osiris,"

the Pataikos of Memphis according to Herodotus. Another rare object is a figure of Isis, in gilded bronze, the goddess being represented seated in the act of giving suck to the infant Horus, whose figure is broken off. This goddess was the wife of Osiris, and her soul was believed to be enshrined in Sothis, the Dog-star, the heliacal rising of which played an important part in the Egyptian calendar.

Case 13 contains a number of votive statues and statnettes; the smaller objects have rings by which they were suspended to walls of temples. Many of these, no doubt, were intended to represent portraits of defunct persons, in the costume and style of the class or period to which they belonged. Carved wooden figures of considerable artistic merit have been found belonging to a period as old as the fourth dynasty. On the pedestals are dedications to different deities. The woods used were ebony, cedar, acacia, and sycamore, the first-mentioned being harder and more costly; the commoner examples are coloured to hide the coarseness of the grain. No. 14 has a selection of objects of furniture, which in the Egyptian household consisted chiefly of richly inlaid bedsteads or couches, wooden head-rests, foot-stools, tables, chairs, and boxes. For inlaying, ivory, glass-pastes, parquetry, and other vehicles were employed; feather cushions, panther-skins, mats of fibre, and other light furniture supplied the wants of the Egyptian householder. The next twelve cases, Nos. 15-26, contain principally vases of different forms, and made of various materials. Stone of several sorts was used for making bowls, jugs, and other forms destined to hold the liquid or solid offerings to the gods or otherwise employed for religious or domestic purposes. Granite, basalt, serpentine, and alabaster or arragonite, a kind of stalagmite of a creamy white colour of great beauty, opaque and occasionally zoned or banded, were favourite substances, and there are many choice examples of these in the national collection. On many alabaster vases is inscribed the name of the monarch in whose reign they were made, as well as of the person in whose tomb they were deposited, and even the measure of their capacity or their dedication to sepulchral uses. These alabaster vases were highly prized, and used for domestic purposes by the richer classes alone. They were even exported from Egypt, and the names of Persian monarchs are found in hieroglyphics upon them. Asia Minor, Greece, and the Isles of the Archipelago occasionally yield, to the explorer of tombs of early date, vases of Egyptian material, if not of Egyptian manufacture. Nos. 27 and 28 contain bronze vessels, and food, fruits, and seeds. The use of bronze vases from the earliest time is sufficiently demonstrated by the discovery of statuettes, weapons, and vessels, with inscriptions upon them, as old as the sixth Egyptian dynasty, that is, about two thousand years before Christ, according to one school of historians, or nearly four thousand according to another school. The shapes are various: jugs, ewers with long spouts, washing-basins in form of the flower of a water-plant, small jugs, cauldrons with two rings holding a loose-looped handle like a modern pail, *situlæ* or buckets, and drinking-vessels of many patterns, occur in this division. They are, as a general rule, remarkably well made, and in good preservation, the material in this respect being very durable. In this division there is also a bronze votive table, or model, inscribed with the name of a priest; upon it are several small model figures of ewers, basins, jugs, plates, and a colander. This is attributed, in point of date, to the remote period of the sixth dynasty, a time of which, curiously enough, there are more memorials preserved in European museums than of succeeding dynasties. As to food substances, Sir Gardner Wilkinson, who has done more than any one else to illustrate the manners and customs of Egyptian life, discusses this branch of his subject at considerable length. Oxen, calves, goats, antelopes, the ibex and leucoryx, and even hyena, were eaten. The sheep, however, is not found. Equally remarkable, too, is the absence of the domestic fowl from the list of birds used at table, while we find various kinds of water-fowl, geese, ducks, cranes, and pigeons commonly in use. The various species of Nile fish, forbidden to, or rather rejected by, the priests as unclean, were, notwithstanding, eaten by some, and either salted or preserved, or eaten fresh. Of these viands, few remains of meat have been discovered, but in the Museum collection are several specimens of bread, fruits, seeds, fish, and a duck prepared for eating, placed upon a small stand. Of the fruit and seeds, we have cakes of barley bread, sometimes in fancy shapes like modern pastry, grapes, figs, dates, pomegranates, olives, cucumbers, onions, and the esculent root of papyrus. Milk, wine, and beer also formed items of the Egyptian commissariat, and some of the wall-paintings of the Theban tombs,—reproduced in many illustrated works on Egyptian manners,—testify to the way in which drinking to excess was practised at the banquet.

The next case, 29, contains arms and implements, weapons and staves, or walking-sticks. The cultivation of the land was carried on by the plough, hoe, and wooden pickaxe, water for the important necessity of irrigation being raised from a well by a long pole on a pivot, or in jars. The use of the sickle also is found. Among the objects in this division are wooden hoes and pickaxes, an iron sickle from Thebes, and a yoke for the carriage of water-buckets. The stick or wand was carried by private persons, and with a short stick the punishment of the bastinado was administered to culprits; several of these, in wood, ebony, bronze, and other materials, are in this division. There is also the head of a papyrus sceptre or stick, composed of felspar. The principal weapons are the bow and arrow, the war-axe, the mace or club, and the short sword or dagger. For defence, the shield of leather, breast-plates armed with metal scales, and hardened crocodile-hide. The cutting edges of weapons are of bronze, the use of which appeared first in Egypt in the time of Psammetichus I., when the Carians and others, allies and mercenaries, first came to Egypt with such armour; and it is doubtful if the use of iron was known in Egypt at an early period. But the natives must have had some method of so hardening their bronze (which contains about 94 parts copper, 5·9 tin, 0·1 iron) that they were enabled to cut and smooth some of the hardest kinds of granite, porphyry, and other rocks and stone. Fishing implements, such as bronze harpoon-heads, wooden boomerangs, or throwing sticks, used with deadly precision against the waterfowl in the papyrus thickets; and instruments for writing and painting, follow next in order. In these cases, among other fine objects, attention may be drawn to a bronze knife, with a handle of onyx; daggers, with handles of gold, silver, ivory, and bronze; cakes of painters' colours; palettes, with various inscriptions; and a leather bag holding razors. Writing materials consisted of the palette; inkstands of alabaster, with oval or cartouche-shaped depressions or wells for red and black ink, for the titles of chapters in the papyri were written in red ink, as in our own Mediæval manuscripts; reeds for writing; and small cups or vases to contain pigments. The principal colours employed to illustrate writings, or to ornament small objects, are red and yellow ochre, blue and green tints of oxides of copper, white plaster, and animal or bone black, suspended in a gum, probably the common gum-arabic. Painters' slabs and mullers are by no means uncommon.

We will complete the account in our next.

ST. SOPHIA.

In more than one respect the great church founded by Justinian at Constantinople upwards of thirteen centuries ago may be considered to be one of the most typical buildings in the world. Regarded from a purely architectural point of view, it is the great example of the domed style, the finest of all styles for interior effect, carried out in a complete and homogeneous manner. It is also the most marked illustration of the employment of architecture purely as a source of interior effect. In this respect, in regard to the degree in which exterior and interior effect respectively, has been consulted, the leading architectural styles of the world are very various in their principle and practice. In some, internal and external effect seem to be about equally balanced, as in the Mediæval cathedrals. In some great buildings, such as St. Peter's, there is practically a failure in effect externally which was not intended, which resulted from the mistakes of some of the architects concerned. In modern Western architecture we not unfrequently find the whole of the architectural effect external, and the interior of the building merely arranged for practical purposes, as in many of our town-halls and municipal buildings. This extreme is the one peculiar to Western architecture, as the opposite extreme is peculiar to Eastern architecture. In the domestic architecture of the East, we find that dwellings of the richest and most sumptuous decoration internally present not a feature externally, a fact which has been sometimes taken as indicative of the social selfishness and isolation of Eastern life. But the great church at Constantinople stands as a solitary example of the erection of a building on the largest scale and of the most magnificent internal effect, in which external architecture is absolutely wanting, and no attempt seems to have been made to render the exterior anything beyond a rough shell to protect the precious kernel of the interior. Even the evidence of design arising from good construction is wanting. Immense masses of matter have been piled up outside in what, even from an engineering point of view must be called the rudest manner, to hold up by their sheer weight and *vis inertiæ* the beautiful internal construction,—masses which are absolutely unsightly, and the work of which might have been done by half the materials scientifically arranged, and of course with infinitely better effect. Yet, entering within this misshapen mass, we find one of the most complete pieces of masonic construction, and one of the most effective and gorgeous interiors, which architecture has ever produced, and we may look all over the world without finding any other example of such a contrast between the outward promise and the interior result. In another respect, too, St. Sophia occupies an exceptional position, as the chief link between the Classic and the Gothic schools in regard to architectural detail, the centre from which radiated the beautiful types of carved ornament, in the shape more especially of capitals, which were to be modified and worked out in France into the more delicate and logical forms of the complete Gothic capital. In this respect the influence of St. Sophia has differed very much in regard to general design as compared with detail. In general design, internally, it was the culmination, the complete working-out of the domical system first suggested by the Romans; and hardly anything so complete in this respect has been achieved since. In detail, on the other hand, it was still tentative, and was a *point de départ* rather than a culmination. To add to its other points of singular interest, St. Sophia has had the remarkable fate of having been built for the celebration of the most characteristic and strongly defined form of Christian ritual, and of having been transformed into the principal home of the ritual of the strongest and most uncompromising rival of the Christian religion.

It is a question to be asked, in regard to the extraordinary discrepancy between the exterior and interior effects of St. Sophia, whether Justinian or his architect in reality intended the exterior to be finished at some future time, just as the façades of the Italian churches were often left to be finished by future generations; whether the original founder adopted the idea of getting a grand interior for the performance of the ritual at once, leaving the less important construction of the exterior out of consideration for the time? It would have been more possible to gain some idea about this from the actual study of the exterior before it was restored under the direction of Fossati in 1847 and the following year. He so far altered and renewed the exterior surfaces of a considerable part of the building that it can no longer furnish much evidence in the matter; and perhaps it never could have furnished this. But it seems to us very improbable that any man who had shown such ambition to produce a gorgeous interior should have been entirely indifferent about the exterior effect, and we lean to the impression that the exterior was never regarded as complete.

It is a common misapprehension to regard the church as dedicated to some special "Saint Sophia" of the calendar, a view which our usual way of translating the dedicatory title of the church serves to foster. But, literally, the church is dedicated not to any individual "saint" in the ordinary sense, but to "Sacred Wisdom," as opposed to the profane wisdom of which the goddess Minerva was the type. The recollection of this is not insignificant when we regard the general architectural style of the church; its large open area, its abundant light, seem quite opposed to the mysticism and gloom which subsequently gave the keynote to the aspect of the buildings of Mediæval Christianity; and such an effect is in accordance with the wider and grander idea suggested by the dedication. In regard to the form of plan adopted, we want the links which would enable us to connect it with its originating forms. The real history of the plan and section of St. Sophia is con-

nected, there can hardly be a doubt, with the Etruscan forms of architecture which so largely influenced the Romans, and the results of which, as far as that people were concerned, culminated in the Pantheon. It is probable that a good many Eastern churches between this and St. Sophia perished by fire, owing to the extensive use of wood made in their construction. We have St. George at Thessalonica as an early specimen, in which the plan of the building, with the circular form showing itself on the exterior, and the section of the dome, bear a very considerable resemblance to the Pantheon, with the difference, however, that the dome form is not shown externally, but is covered by a wooden roof, the outer walls being carried considerably above the springing of the dome. Mr. Fergusson classifies this as "Eastern Romanesque," a title which comprehensively expresses the historic relation of such a building. He assumes that it was erected by Christians, at about the approximate date of A.D. 400. The next known specimen after this, the church of SS. Sergius and Bacchus at Constantinople, brings us to Justinian himself, and may be regarded as a kind of trial on a small scale of the architectural scheme of St. Sophia; not that it was so intentionally, but under the circumstances, after the burning of Constantine's original St. Sophia, it might very well have been so regarded. Like the Pantheon, it exhibits the dome externally, and shows the tendency to the flatter section of dome which was afterwards adopted in the great church; and in plan it exhibits the principal characteristics of St. Sophia in a simple form; the square surrounding the dome, and the galleries and two-storied narthex. The main difference in St. Sophia is the lengthening out of the central space from a square to an oblong by the bold and happy introduction of the semi-domes from which the great dome springs, and which gives to the interior a unity of constructive effect such as hardly any other domed church possesses. In fact, the practical elements of architecture are as remarkably displayed in the interior as its æsthetic elements, and it is noticeable that, the rebuilding of the church having been rendered necessary in the first instance by the burning of the previous basilica, it was made a *sine qua non* by Justinian that it should be built exclusively of non-combustible materials, so that St. Sophia takes rank as the first fire-proof structure we know of that was intentionally so built. All the records of the construction of the building are indeed creditable not only to the ambition but to the practical good sense of the man who called it into existence, and boasted (probably quite within the mark) that he had surpassed Solomon.

In speaking of the historic position of the building in architecture, we may observe that recently a writer in *L'Art*, M. Léon Hugonnet, has started a somewhat fanciful theory in regard to the supposed influence of Egyptian upon Byzantine architecture. The architecture of Justinian, he says, seems to him to be *l'architecture Egyptienne rentrée dans l'architecture grecque"*; and he traces this assumed fact to the influences of the solitary saints of the Thebaïd, whose opinions governed the Christian world, and who introduced or recommended the introduction into Christian architecture of the forms they were familiar with in Egypt. It does not appear to us that this theory has more claim to serious consideration than a good many others which have been developed by French theorists on architecture, who have a great tendency to construct architectural relationships and theories of this kind out of their inner consciousness. That there is a connexion to be traced all the way back from the Gothic column to the Egyptian is true enough, but certainly the immediate connexion of Byzantine detail is with Greece and Rome, and the immediate connexion of its general scheme of building is with Rome. The only partial countenance that may seem to be given by St. Sophia to this Egyptian theory is in the battering of the lines of the masses of the external walls and counterforts; but considering how nervously anxious Justinian and his architects obviously were in regard to the stability of the building, from the way they piled mountains of buttresses against it, the idea of buttressing might have been sufficient to lead to this adoption of sloping lines, without any hints from Egypt or from the hermit saints, who we should imagine were about the last people to give much attention to architecture: and at all events, this portion of the building is architecturally the least important of all. Any critic who can trace direct Egyptian influence in the interior must, we should imagine, be very strongly biassed by a preconceived theory.

We have observed that the detail of St. Sophia was dependent on Greece as well as Rome, and it is curious that in the treatment of the carved capitals there is in many cases a much closer approximation to Greek feeling and forms than to Roman, and at the same time that the method of using, reproducing, and modifying these forms is, as we shall have occasion to observe, exceedingly capricious, even in contiguous parts of the same building. Some of the preliminary forms of capital a century earlier than St. Sophia are to be found in the basilican church of St. John at Constantinople, where there are capitals with a distinctly Roman or Classic outline, but with foliage assuming a tendency towards what were afterwards known as Byzantine forms. In some of the St. Sophia capitals, on the other hand, there seems to be a mingling of the old and new element in an opposite manner: the general forms of some of the capitals are Byzantine; for instance, they are longer in proportion, straighter lined, and less elegant than the Greek and Roman types of Corinthian capital on which they are founded, but the foliage bears a stronger resemblance to the Greek acanthus than to the Roman, and in some cases may fairly be said to be superior to either in its treatment, and the combination it exhibits of flowing line with sharp and crisp character and outline.

The transition of the building from being a Christian church to becoming a Mahommedan mosque took place in 1453, under the sultanship of Mohammed II., who built the first of the four minarets of curiously mongrel style, which now mark the four angles of the building externally, the one at the south east angle. Rather more than a century later Selim II. built the north-east minaret, and his successor, Amurath III., built the two at the western angles, adding also a great deal to the external buttressing, with well-meant but clumsy solicitude for the security of the structure. The building, however, towards modern times, was gradually sinking into a somewhat dilapidated and precarious state, and in 1847 the then sultan called in the architect Fossati to superintend a thorough repair of the building. Fossati, fortunately for himself, lived before the existence of a society for the protection of ancient buildings, under whose *régime* the Church of Sacred Wisdom would probably, by this time, be level with the ground. As far as regards the interior he seems to have used good judgment; there may be some question as to his treatment of the exterior. He found the church with many sinkings in the large dome arising from settlements in the substructure or in the buttresses, and not a few of the interior columns dangerously out of the perpendicular from the same cause,—in one or two cases columns which bear integral parts of the structure. All these were brought back to the vertical position except one, the handling of which was interfered with by the proximity and pressure of one of the minarets and its base and buttress. Portions of the large buttresses were rebuilt or re-cased, but the flying buttresses from them to the lowest ring of the great dome, which cut very awkwardly into the lines of the dome, were removed, and an iron chain put round the base of the dome instead. The lead over all the cupolas and other roofs was repaired or renewed. The surfaces of the great buttresses were finished up with a kind of imitation of coursed rusticated work in cement, and they were given also a new finish at the apex, a kind of semicircular saddleback with a circular ornament inserted in the front of the buttress, concentric with the lines of the capping. Fossati has preserved the original appearance of the exterior before he touched it in what purports to be an accurate view; and it must be admitted that in the building as it was previously there was a distinctly Oriental appearance which harmonised with its history and surroundings, and that the hand of the Western architect is somewhat too manifest in the external appearance as Fossati has left it. In the interior the ancient splendour was altogether dimmed. The inlays were dull with time, and the mosaics had been covered over with layers of plaster and other coverings to hide from the eyes of the faithful the idolatrous figures which they contained. This fact is perhaps a tribute to the permanent character of mosaic work, for it may be presumed that the Mussulman enthusiasts would have destroyed the mosaics altogether if they could easily have done so. Fossati, discovering accidentally the presence of some mosaic figures under the plaster in the vault of the north-west angle of the aisle, had other portions of the vaults uncovered, and it was then seen that the whole had been sumptuously decorated with gold mosaic, the gilding and ornaments on which were now renewed, while the obnoxious figures were ingeniously obliterated by powdering which could at any time be easily removed should the building pass into other hands, or should the followers of the Prophet relax their rule in regard to figures. In the same way there were found on the wall of the outer porch, over the door leading into the narthex, portraits in mosaic of Constantine and Justinian, and these have been covered again with a lightly-painted ornament in quasi-Arabic style, which at once conceals and protects them. The building thus came out in something like its old splendour so far as colour effect was concerned; and the furniture was renewed in a sumptuous manner. The effect of this cannot be well realised in an engraving; the gilt chandeliers, for instance, stand out in reality with great brightness in the total effect, while neither that nor the effect of the mosaic can be conveyed in black and white; but the illustration* gives correctly the grouping and effect of the architectural details (of which a word more just now) and of the principal objects in the building, which, indeed, are not many; the simplicity of Mahommedan worship having its advantage from an architectural point of view in this way at least, that it leaves opportunity for a large extent of open and unencumbered floor space, nothing being needed for the majority of the worshippers beyond a spread of carpets over the floor to kneel on. The octagonal erection on the left of the view is what in English would be called the Sultan's pew, which is also a sumptuous erection covered with gilding, and surrounded to the greater part of its height by rich tracery, which avails to hide the royal worshipper from the view of the people, though leaving him with a full view of everything. It need hardly be observed that this is a modern addition. Two remarks may be made, before quitting this part of the subject, in regard to the effect exercised by Mahommedan arrangements and furniture on the interior of the building. One of these arises from the fact that the building, not having been built as a mosque, does not front towards Mecca. The Mahommedan conquerors could not alter the orientation of the building; but as your true Mussulman always prays kneeling or standing on a mat or carpet, it occurred to them to right the matter by arranging the carpets in reference to Mecca, and at right angles with the true Mahommedan orientation, so as to run in oblique lines across the floor. This method being religiously carried out in every part of the building, and arresting the eye at once, gives an idea of the whole structure having been built askew; but, though a rather provoking effect architecturally, the incident is so interesting in its associations and suggestions that perhaps no one would wish it otherwise. The other point is a very different incident, too prominent in every view of the interior, namely, the hideous effect of the great circular panels, with texts from the Koran inscribed upon them in colossal characters, which are painfully conspicuous in our view of the interior. They cut up the architecture most cruelly, and greatly injure the scale of the building; and it is a marked instance of the essentially Puritan character (except in one particular) of the Mahommedan faith, that it exhibits so strongly in this case that absolute indifference to artistic effect as compared with spiritual and moral enlightenment, which is one of the leading characteristics of all Puritanism.

Running over, in conclusion, some of the points in the architectural scheme of the building, we are struck with the curious mingling of Classic with Christian associations in the architecture of this once Christian temple. We enter the narthex, at the south end, through a porch with an almost purely Classical cornice, Roman in style, and through a door of bronze in an almost pure Greek style, evidently brought from some Pagan shrine. The shafts of the columns in one corner come, so tradition has it, from some disused temple at Ephesus; in another we find reputed spoils from Baalbec, in some cases various-sized drums of shafts joined by metal rings. In the arcades on the upper story over the central part of the nave, we have the front row of columns, those which form the screen

* See p. 452.

visible from the body of the church, with quasi-Corinthian capitals, retaining very much the general outline and character of the Corinthian capital, only with smaller volutes and somewhat different type of foliage. Immediately behind these, the columns which carry the springers of the vaulting have a compound capital, consisting of the straight-lined carved block peculiar to Byzantine architecture mounted on an almost pure Roman Ionic capital. Everywhere there is this curious transformation of old forms, or mingling of old details with new combinations, proclaiming that architecture was at this time entering, or preparing to enter, on a new path.

Going back for a moment to the door between the entrance-porch and the narthex, mentioned before, we find in the simple yet rich architecture of the narthex another application of Classic forms. Here the supports are massive square pilasters, with a capital in three stages, which somewhat suggests the idea of a portion of a Classic architrave, with its crown moulding and its two facets, only all elaborately carved. This is, at least, far better than the Roman idea of twisting the whole members of an entablature round the top of a column. The roof is a simple quadripartite vault; a domical roofing would have been more completely in keeping with the character of the main portion of the building. The treatment of the angles of the plan, with their screen of columns arranged in a quadrant separating them from the main area, is most happy, both above and below; it includes something of the real poetry of architecture, giving at each turn a new view of the structure,—a new perspective effect. This would strike even the unlearned spectator, but the architect derives still greater pleasure from the beautiful and architecturally truthful treatment of the great piers and the interspaces between them; the piers are almost unbroken solid masses, only diversified by inlay; the arcades between filling up what is constructionally a void in the most appropriate and graceful manner, giving breadth and unity to the whole while clearly defining the supports of the building. The advantage in the way of internal effect, from the low pitch of the dome, which enables the eye to take in at once and appreciate its real size, has been often remarked on and contrasted with the less satisfactory internal effect of the loftier dome of the great Latin cathedral; but not so often has the peculiarly beautiful lighting of the dome been commented on, the manner in which light has been poured in through what is the heaviest part of the section of the dome, yet without obliterating the appearance of constructive security. The whole idea of the treatment and roofing of the great central compartment is one of the most noble architectural conceptions that has ever been carried out, and the interior is not less remarkable for its grandeur as a whole than for its picturesqueness in detail, and the interest and beauty of its decoration.

ARTISTIC PROSPECTS OF THE MODERN RENAISSANCE.

Beneath the briefest introspective glance of a generation too feverishly emulous of advance to linger upon any subject whatever, the fact of a present certain human moil must become sufficiently luminous: a moil that, being material, moral, intellectual, and imaginative, can be covered by the most comprehensive epithet alone.

Not that the age has gone mad; far from it: yet does it evince a want of rest and coherence that should, speculatively, affect its departmental functions. Art, in her various phases, must peculiarly suffer; for while Science goes with judicial imperturbability straight for his mark, accepting rebuffs with fortitude, wishing to see nothing but the sparkling grain of truth at the bottom of his crucible; she is the enchantress who loves to spread her gorgeous skeins of fancy around her, developing at leisure the woof that is to take captive the minds of men with the novelty of a creation. The renaissance in progress is, indeed, as distinguished from the earlier period of literary and artistic revival, expansive rather than consecutive, affecting the entire body social. Thus, political problems are enlarging their spheres of activity, while science and dogmatic theology, like armed powers keeping to the neutral zone and equally prepared to fight as fraternise, seem awaiting an umpire.

Such, however, is the marvellous fruitage of inductive science, that the field of inquiry is kept crowded with ill-assorted wonders, and a spirit of tentative compromise which aims at patching current theories rather than launching new ones, is the rule.

Our forefathers, whether of the past century or the past cycle, might project their minds into the most grotesque regions of thought without being challenged. We cannot afford that. The front files of the on-coming future tread so closely upon the heels of the present that the dread of exposure is greater than our greed for notoriety, and, ceasing to theorise, we too often cease to classify. Speaking the truth was what our forefathers had chiefly to fear. Not so we. We need not, indeed, recant a sincere conviction, adding the stealthy reservation *e pur muove*. Ours is an epoch when heroes might flourish; but the fear of ridicule, more potent than the rack, keeps in the bounds of decorum, if not of mediocrity, us of whom Science, the athlete, has a lead of many lengths.

Using the term "Renaissance" in the limited sense we are accustomed to attach to it, we can, without absolutely forgetting the flood of social turbulence which is bearing us along with it, contrast current aspects of thought with those obtaining at the earlier historical period. The Renaissance of history was a new birth of art and of letters, yet by no means so abruptly defined as we are apt to imagine. Latent in cloister and cell, the embers of a new culture smouldered long before they burst into flame. A Venerable Bede, a Chaucer, not inadequately represented two of the Muses. Ireland was but declining from her brief zenith of native civilisation. But, until the invention of printing, learning could not become popular, for pontifical Catholicity failed to do what the ancient States, with their profound reverence for Nature, did. Christianity had triumphed, but over much that was excellent as well as over much that was hateful. The Roman had his pride of citizenship and his possible apotheosis; the Athenian, his sympathetic union with Nature's mysterious legion of gods and forces; but the Christian layman of what we term the Dark Ages was not encouraged to assert the superiority of the human soul within him, being kept within conservative channels of inquiry by the clerics, lest worse might befal him. When, however, Faust and Guttenberg, together with others, had completed their modest plan for the diffusion of learning, Mind unfolded into a beauteous flower, which was the logical sequence of the bud that the Church had so long pruned and tended.

Faith was to the intellect of the Renaissance what the worship of nature and of power was to the ancients,—the nucleus around which gathered all the accretions of learning.

Art quickly ran through its invariable course of development: architecture, poetry, painting, and music. The former had reached much excellence, as our old abbeys remain to show; yet the genius of no Michelangelo had been enlisted, either in the grander walks of architecture, or in the embellishment of cathedrals with frescoes and with carving. If it be in the nature of things that architecture takes precedence of the other arts in point of time, it is equally true that she embodies the leading principle of the day. The vastness of Assyrian and Egyptian designs, the chasteness of the Grecian Orders, the dignity of the Roman works, the ornate effeminacy of the Aztec temples, are distinctive of race and sentiment. The Roman arch, too, if a comparatively late idea, need not be mistaken for the Saxon one which resembles it, still less for the Norman. Mediæval church architecture, largely as its prevalent form, the Gothic, has borrowed from Saracenic models, is characteristic and strongly typed, a fact that it needs no skilled architect to discover. Viewing one of those old buildings, one feels that each part has its meaning, and that an ardent central idea has taken to itself flesh of stone and mortar. It is not thus with the architecture of our times. It is not that our modern Renaissance lacks vigour; but that no vivid idea lies at its centre; still more, that bases of research are shifting from day to day, and human opinion shifting with them: the light that we have is dazzling, but comes through no one channel; diffusive and evanescent, it offers no background of shadow for purposes of contrast. Perhaps, if one half the kingdom were depopulated and conserved for Patagonian savages, while our bishops made their *autos da fé* of our literature and of our scientists in the squares, we might, between awe for Mother Church and the perverse human instinct to prove its superiority over its neighbours, develop both a faith and a genius. It must not be overlooked, however, that the spirit of liberty, which was a suckling once, is a giant now, and rebellion against the paternal hand which used to keep thought in its channels, might destroy the parallel. Though art may be the loser, we prefer to make, each, his points and his failures on his separate account.

Progress is the motto of our age, but so rapid is its march that, throwing away its *impedimenta* as irksome, it is now and then astounded to find that it recognises neither itself nor its surroundings. The old distinction of gases, liquids and solids is known to be fallacious, while certain gases are coming to be considered as metals.

The so-called imponderables, again, have undergone a vast change in estimation. Our regard for law leads us to shun the theory of the existence of matter exempt from the property of gravity, while the "correlation of forces" puts a fresh aspect upon molecular possibilities. This correlation is becoming intensified into a true "conversion" of forces, and the alchemist's dream of the transmutation of metals is moving into line with other possibilities once more. Chemical nomenclature is so altered that Dalton, Cavendish, even Faraday, the latest of the great fraternity, would, if living, have to discard much, and re-arrange more. Subject to incessant eliminations, the intellectual field that comes under review of any one life is necessarily vague, circumscribed, and out of apparent consecutive dependence upon preceding lines of investigation. The scientist himself may reject errors intelligently, and carry human knowledge to a higher stage, but, to numbers, this want of fixity gives irresolution, and to none more than to followers of the arts, whose knowledge is less critical than their sympathies are expansive.

Want of certainty of touch either causes timidity in conception and weakness in execution, or inflates with the prurient immodesty of shallow thought simulating genius. In architecture, gaudy effect usurps well-balanced design. Scientific aids of drainage, lighting, and heating are, though loudly professed, poorly invoked. When anything more than a pretence, they are seldom decently subordinated to the plan. Invention lags, so that posterity will not be able to point with confidence to representative specimens of Victorian architecture: adaptation is our servile climax.

No doubt we are better housed, clad, and fed, than our forefathers, and that is much. We also are popularising knowledge with a view to awakening a national interest for art. Nor can it be concealed that we are struggling to regain, in very many departments, the forgotten secrets of ancient excellence. With our art schools, and other propaganda of the day, we may hope to develop public taste up to the level of its capacities, and these means have been unexpectedly fertile already in refining or educing the lower functions of taste. Our more solid triumphs may be to come, but are they likely to be as glorious as those of the Renaissance of history? This interesting question can only be conjecturally answered, but the chances are that the Renaissance which has begun in our day will not, itself, develop a high order of genius in any artistic department, but that its reaction will. Our age is scattering more seed, than it is garnering in the harvest. Scientific research has been busily promulgating facts which our successors must arrange.

Law is hinted as likely to underlie this or that, but no clear consensus of laws has been discovered, while the mind of this century, fevered and worn, is ill-adapted to condense from the chaotic sum of facts before it a vivid and coherent cosmogony replete with human feeling, such as is demanded of high art. The social state reacts upon the individual: a man is a unit now, a cog in a great machine; labour is departmental and perfunctory. As regards literature, it is not food for thought that people seek, but devices for obviating thought's necessity. Fictional writing is, in the main, flimsy and meretricious,—emotional phases of character being preferred to the deeper discoveries of the great masters. Even this tendency towards character-portrayal is, since George Eliot's death, left without a high exemplar. The poetry of the period is maudlin and insincere; the drama, composed either of adaptations of French plays, or of sensational figments too powerfully concentrated to have literary value, and touching none of the nobler qualities inherent to human nature. If there be a characteristic that more than any other belongs to modern imagina-

tive thought, it is a vague vastness relieved only by its complement: petty frivolity. The former tone has its advantages, the latter, none. The first may be the *nimbus*, containing the germ of a new mental and moral birth,—climax of the Renaissance in progress; the other is a common mark of unsettled purpose.

We are selfish, living more for ourselves and less for posterity than our predecessors. Reverting for a moment to architecture, it is true the Thames Embankment and kindred works will stand, evidences of engineering skill, yet with no pretensions to character beyond those of vastness and utility; but the railways, the telegraph lines, the gas and water systems, our great city itself, are for the living; our legacy is one of ideas alone.

We have built no universities in our day, but we have the gigantic School Board system; no cathedrals, but tabernacles and rotundas to spare, all of which will come down and, possibly, be renewed, while Westminster Abbey waxes hoarier and more firmly knit.

Where the grand vagueness which is the characteristic of our public architecture under its best manifestation has no scope, the frivolity of the contained idea is often painfully evident.

In the domain of verse, Tennyson is massive, but unsymmetrical; quaint, yet devoid of humour. Browning, for inharmonious energy, is unique. Swinburne, melodious as are his numbers, lives in a world apart from ours. Had circumstances favoured, he must have been a representative poet, but he turns from it in despair, to hold commune with Eros in Arcadian groves.

If we turn to painting, we see a spurious sentimentality usurping the place of legitimate human feeling. The desire to achieve sublimity is there, but the power is wanting. Realism is aspired to, but honest work of flesh and form is slurred. As is the case when Art lacks force, weak allegory is used to cover defects. "Suggestiveness" is, also, an artistic excellence much aimed at, a favourite subject being the juvenile figure and a member of the brute creation. Let it be a child and a dog. Contrast is, here, between beings of diverse species, Nature's distinction, not the artist's.

Music, the capital of the graceful column of the arts, partakes of the vagaries of the modern "æstheticism" which is common to those already touched upon. That which has been termed the "music of the future," as especially implying the Wagnerian school, is really the music of to-day. Vague, mystic, inchoate, it grasps at the ideal it cannot seize, scorning the limits within which the great masters of melody found it necessary to confine their genius. As for our popular melodies, they are remarkable in not possessing melody at all: lacking a core, our tumultuous renaissance runs its sentiment to waste. We cannot turn backward the wheels of progress, and may not, amidst the distractions of a nervously hurried material existence, look for a revival of that glow of heroic enthusiasm with which Mediæval thought, then young, and fresh, and simple, slipped the leash in which it had been confined, but where it had gained strength and sincerity. Our hope is that the reaction from all the oppressive materialism and uncandid sentiment that clog the art of to-day may intensify; that humanity may, by scientist, artist, and poet, whether of word or of tone, be reinstated as lord over the blind forces of nature, instead of being widely regarded as but an inferior force, without the dignity that belongs to human personality.

The Church preached the close union between divine and human; we may hold up man's sublimity as remodeller of the Natural Arcanum, when, no longer a football at the mercy of the Fates, as was the ancient conception, nor the vehicle of miracle, as was the theory of the monks, man may be seen to move freely and intelligently among the elements, as deputed lord.

The apotheosis of our great men of science need not follow, for our temple should be bathed in the white, cold light that kills credulity. We lack the spark of self-respect which underlies all excellence; humanity must feel itself ennobled, and the arts, seizing upon the idea, will weave around it with mathematical accuracy the web of contemporary thought and revised scientific teaching. The renaissance will, under such a reaction, prove one of classical purity as well as of unexampled vigour.

The Savoy Theatre.—The opening of this theatre, described by us a fortnight ago, is postponed until Monday evening next, in order to perfect the electric-lighting arrangements.

HAMPTON COURT AND VERSAILLES.

As in so many other cases, it is perhaps owing to its literary celebrity,—a celebrity that is made for it by French writers,—that Versailles is so much more famous than Hampton Court. What Englishman, what stranger, considers his visit to Paris complete without having passed at least a day at Versailles,—if he may not see the fountains play, at least to wander through the interminable apartments of the huge palace?—but how many visitors are there to London who leave our shores without having considered it necessary to spend a day,—an afternoon, indeed, is sufficient,—at Hampton Court Palace? And yet, looked at impartially, Hampton Court is more interesting, or should be so, than Versailles. If comparison were necessary from their historical and artistic interest, it would be much more the deserted palace of Fontainebleau than Versailles that Hampton Court might be said to resemble, though old John Evelyn remarked, now more than 200 years ago, that Fontainebleau "was nothing so stately and uniform as Hampton Court" (March 7, 1644). At the time that Evelyn visited Fontainebleau, the site of the yet unbuilt palace of Versailles was a sandy, unhealthy plain. Fontainebleau lies some twenty-four miles or so from Paris, while Versailles and Hampton Court stand nearer to their capitals, the former ten miles from Paris, the latter fifteen miles from London.

Though it cannot be said of Hampton Court, as it can of Versailles, that from the moment of its completion it has been a royal residence, the annals of Hampton Court are closely connected with the lives of more than one of our kings and queens; but its modest proportions, while long affording ample accommodation to our English ideas of regal splendour, cannot certainly be said to vie with those of the recklessly-erected acres of Louis XIV.'s hobby. Happily, for the memory of our rulers, no blot exists in the story of the creation of Hampton Court such as stains the early annals of Versailles. When Wolsey determined to build the palace he was so soon to give to his royal master, he expressly sought the most healthy spot to be found near London, and he fixed on Hampton Court; but no such precautions did Louis XIV. use when, a century later, he determined on Versailles as the site of his future residence.

The story of the Aladdin palace which Louis XIV. called up from the unhealthy desert of Versailles is familiar to every reader of French history, and at what cruel expense of life the hobby was at length carried out, contemporary writers bear sufficient evidence. Thousands of workmen and soldiers were employed to bring water to the sandy plain, and the "Letters of Mdme. de Sévigné" and the "Memoirs of Mdme. de Lafayette" tell us of the terrible effect produced by the miasma exhaled by the freshly-disturbed earth; every night, carts filled with the dead defiled silently along the road. One of the most eloquent of the chapters in the "Memoirs of Saint-Simon" is devoted to an attack on the creation of Versailles. Delightful St. Germains, long the pleasant home of the court (Louis XIV. was born at St. Germains, where, in later years, he was to lodge our English "Pretender"), he had determined to leave; tradition says, because the distant view of the cathedral of St. Denis, the burial-place of the French kings, disturbed his "immortal" grandeur. If Skelton, in some measure the Saint-Simon of Henry VIII.'s reign, has satirised in his biting lines the erection by Wolsey of so regal a residence as Hampton Court, his accusations are but the witty expression of the envy which Stow tells us was excited at court by the cardinal's magnificence. There is nothing analogous to the simple narration by contemporaries of the facts connected with "that cruel folly, that Versailles of Louis XIV.,—that master-piece, so ruinous and in such bad taste,—where whole changes of forests and water have buried so much gold."

What Versailles cost will probably never be known; it has even been said that Louis XIV., frightened at the terrible cost, burnt all the registers. As far back as 1801, however, a distinguished architect, M. Guillaumot, in the course of some observations on the injurious effect of the ignorant objections raised by the unprofessional public against the enormous expense of the building of public monuments, brought forward some interesting results of a lengthy research among the State documents; among these he finally discovered some accounts relative to the erection of Versailles. The tables prepared by M. Guillaumot comprise the expenses from 1674 to 1690, and we give these figures as affording a curious comparison with some figures given recently in these columns relating to the expenses of the great hall of Hampton Court Palace.

Masonry, &c., of Versailles and its dependencies, 42½ millions of *livres* (francs); timber work, 5 millions; slating, 1½ million; lead work, 9 millions; carpentry, 5½ millions; locks, 4½ millions; glass, half a million; mirrors, half a million; paintings, gildings,—not pictures,—3½ millions; sculptures, not antiques, 5½ millions; marble-work, 10 millions; bronzes, 4 millions; iron and lead pipes, including those for the famous "machine de Marly," 4½ millions; tiles, paving-stones, and cement, 2½ millions; gardening, fountains, and rockeries, 4½ millions; excavating and removal of earth, 12 millions; divers extraordinary expenses, 6 millions; the Château de Clagny, 4 millions; the "Machine de Marly," exclusive of the Versailles expenses (this machine brought, as it still brings, water from the Seine to the fountains of Versailles), 7½ millions; the aqueduct of Maintenon, 17½ millions; the Château de Marly, 9 millions; indemnities to landowners, 12 millions; purchase of old pictures and antique statues, 1 million; gold and silver stuffs, 2 millions; plate, 6½ millions; crystals, agates, &c., 1 million; architect's fees, 2 millions; expenses previously to 1664, 3 millions; a total of something like 190 millions of francs, though 400 millions of francs is thought much nearer the sum expended than the lesser figure; a very large number of items being omitted in the above account.

Hampton Court cannot tell such a tale of pompous expenditure, and if its simple yet effective architecture, its prim, well-laid-out and well-kept gardens, cannot be said to bear comparison with the splendours of Le Nôtre's botanical skill and Mansart's royal designs, happily the story of its various occupants can equally, with difficulty, be compared with that of Versailles in its connexion with the French monarchy during its most dissolute days. But putting aside the past both of Hampton Court and Versailles, a comparison between the present condition of the quiet, suggestive, old English palace on the banks of the Thames, and the upstart, overwhelming, grandeur of Versailles, there can be scarcely differing views that with the former rests the superiority. Mr. James, the American writer, tells us in his most recent tale that the Americans are especially fond of Versailles, because there they expect to find uninjured the thorough life of the "old *régime*," and he expresses amusingly the disappointment of one of his characters who on visiting Versailles, with a view to obtaining a knowledge of the mode of life, finds the old town all but occupied by his republican countrymen. We strongly suspect that our impressionable cousins would not meet with such a disappointment were they led to expect to find at Hampton Court the relics of our old monarchy.

Versailles, with its miles upon miles of parquetried floors, its "gilded saloons," acres of meaningless decorations (Lebrun, &c.), tells only too plainly its history, over which it will be found that a false glamour has been successfully thrown. From an artistic point of view there cannot, in the mind of the thoughtful visitor, be two opinions as to the superiority of Hampton Court over Versailles; indeed, this was the point at which we had desired to arrive more immediately than we have done. The comparison which may be drawn between the existing collections of art, gathered respectively at Hampton Court and at Versailles, cannot be said to lie in favour of the latter.

There has recently been published an excellent catalogue of the pictures collected at Hampton Court. It lies in the power of any reader to compare Mr. Law's interesting volume,—or, indeed, for ordinary purposes the little guides that exist for Hampton Court will be found amply sufficient,—with any catalogue or notice of the artistic contents of Versailles; the comparison thus easily afforded will, we think, be found enough to justify our opinion. It is not alone from the fact that the creation of Wolsey's Palace takes us back nearer than Versailles to what the Italians well understand by "the epoch,"—the great epoch of artistic history,—that the contents of Hampton Court will be found to possess an interest to the art-student that is wanting at Versailles. Putting aside the now removed Raffaelle cartoons,—once the glory of Hampton Court,—as also the Mantegna tempera

pictures, there will be found abundance of other material for much interesting and profitable inquiry. The portrait collection of Versailles,—almost without exception modern,—will scarcely compare with the collection of portraits at Hampton Court: the Lely beauties, so long preserved at Windsor, and known, indeed, in the history of English art under the name which Walpole gives them of "the Windsor Beauties"; the Knellers, the Van Somers, the Honthorsts, the several superb Italian portraits,—among them a masterpiece by Titian,—the characteristic Velasquez, the Van Dycks, the Holbeins. Where at Versailles can be shown portraits as interesting as that of Lord Surrey, the Zucchero representing Queen Elizabeth in a charming fancy dress, several Gainsboroughs, and a dozen more other rarities of the painter's and portraitist's art? Horace Vernet's acres of much-vaunted battle-pieces we can look on, in the present day of Alfred de Neuville and Miss Thompson's triumphs, with much less enthusiasm than the generation of Louis Philippe's vigorously attudinising generals and over-costumed statesmen.

This is the season of the year when many English people are already abroad, or are going abroad; to those who have not as yet crossed the Channel and have a little time to spend in London before going to Paris, we would say, Do not fail before leaving England to pass an afternoon at least at Hampton Court in its quiet seclusion, undisturbed by the rush of the excited tourists that for ever seem to delight in rousing the hollow echoes of the long galleries of Versailles, and making tingle against each other the thousand rainbow-coloured drops of the glittering chandeliers in the famed *galerie des glaces*.

It is not a little strange that the settlement immediately in the neighbourhood of the English palace possesses so little charm compared with the surroundings of Versailles. Versailles leaves an impression on the minds of most strangers of being a delightful place of residence, and many Parisians of fame have indeed found it so; probably it is to this fact that Versailles owes so much of its charm. Such a feature is all the more remarkable as the natural position of Hampton Court on the pleasant banks of the Thames is one that is far superior to that of Versailles, surrounded by its miles of uninteresting flat plain.

THE PRESENT CONDITION AND HOPES OF ARCHITECTURE.

If the English lover of the Græco-Roman and Italian columnar style feels surprised at the existence of dissatisfaction with this architecture evinced by the oft-repeated complaint of our want of a national style, he must feel infinitely more so on discovering that a similar dissatisfaction with the style exists among the Italians themselves; which is the fact, if the declared persuasion of an eminent critic (Signor Camilla Boito) of the necessity for a new style, and attempt to invent one, together with his being allowed opportunity of embodying the result in important buildings, are to be taken as an indication of the public feeling.

Let us consider what the columnar architecture is, which has come down to us through many hands, and the foreshadowing of which formed the material grandeur of the early and renowned capitals of the world,—Nineveh, Babylon, Persepolis,—which was the glory of Athens, the magnificence of Rome; and for the embodied relics of which at the revival of art the greatest architects of Italy dug as for hidden treasures. The classical columnar ordinance of the Greeks and Romans I look upon as the essential nucleus or framework of the architecture of the world, for which we can imagine no substitute, and which must have appeared had the temple solemnities of Egyptians and Greeks never required it. It lay, a divine creation, like geometry or analysis, in the womb of chaos, and must of necessity have been called forth by the first imaginative and cultured people. It is, like the mathematics, rather a discovery than an invention of man. It is not occasional and peculiar, but symbolical and universal. Whatever new building material was introduced into architecture, or whatever material becomes dominant, the colonnade will not become obsolete. The simple and natural beauty of insulated columns, the magic of peristylar perspective, must ever charm the imagination of the educated and uneducated, the young and the old. The exclusive admirer of the Gothic should remember that that style is a lineal descendant of the Classic, and owes to the Classic its most pleasing features. The most beautiful Gothic cathedrals are those that show most reminiscence of the colonnade or round columns, a dearth of which always produces a harsh, liney appearance.

The same may be said of the Byzantine, Saracenic, and other styles. In fact, in the Greek temple of Corinth were lodged the germs or principles of the whole architecture of the world, as are the rudiments of the future plant in the seed. For this reason it is that in treating of the position and hopes of architecture I confine myself chiefly to classical, and not from any narrowness of view and aim, or lack of sympathy with the other beautiful and interesting, and equally true phase of it.

You meet with the colonnade, or anticipations or reminiscences of it, every where,—in the Hindoo and Buddhist temples, and cave temples, and in palaces, tombs, and mosques of all Mahommedan lands. Architectural ambition has almost always embodied itself and broken forth in columnar grandeur; as if the beauty and capacity for sublimity of groves of columns had smitten the imagination of every people possessed of one on the earth.

It is absurd to go into raptures over the Parthenon and be, at the same time, indifferent or opposed to the columnar style, because all that charms us in that building belongs to the columnar style, every example of which is susceptible more or less of the beauty and harmony of the Parthenon, which, denuded of its sculpture, remains exquisite architecture, proving it, like female loveliness, independent of the foreign aid of ornament. But the quality of being self-dependent or having need of nothing bears most analogy to the excellence or perfection of the Supreme Being, and therefore most divine. It is an attribute of the style that eminently fits it for the solemn temple, which it will as truthfully form as the gorgeous palace. And if it cannot express so vividly the hopes and aspirations of the Christian as the Gothic, its abstinence from the attempt is to the preservation of beauty in its sacred embodiments, and renders them a truer reflection of that grace of external nature which is the veil of the Eternal Cause, and nearer to the fashion of the shrine which we may suppose He would himself have built to his worship; more likewise in unison with the holy and beautiful breathed from the Lyre of Inspiration.

Let no one suppose the columnar architecture a mere stereotyped formula of three or four columns; for the scope for variation on their capitals alone is infinite. To it belongs the dome in its utmost chasteness and grandeur.

This is the style which certain architects and critics would supersede by some new invention.

The sudden appearance and general introduction of a new style has no precedent in the history of architecture, even among the most artistic nations. We can trace every known style back to its origin and descent from one or more parent styles, generally to two, except the Pelasgic, Egyptian, and Assyrian, their origin being lost in the night of time, and no remains of earlier styles having been found. New styles, it is true, have been evolved spontaneously and slowly by the mingling of two others, and may be again,—the growth of similar circumstances; but no style was ever called out of chaos. To reject the columnar ordinance of the Greeks and Romans, and seek for new elements, is as absurd as to reject all that has been wrought out in philology and literature, and go back to Cadmus or to hieroglyphics. He who does so places himself in a worse position than the first nations. He is like a poet by nature, endowed with the highest gifts perhaps,

> "The vision and the faculty divine,
> Yet wanting the accomplishment of verse."

He forgets, or is ignorant, that architectural creation does not consist in calling architectural designs from nothing; that it matters not how much an architect is indebted to other men for his materials, if he combines those materials according to new affinities and "adorns nature with a new thing." Nor need he be surprised if any architectural style which is the child of his own brain, does not find favour, or that it results in something the embodiments of which in buildings it would be flattery to call architecture. He must, indeed, soon discover that his only chance of competing with the past in architecture is to avail himself of the labours of his predecessors, and adopt the columnar ordinance of the Greeks and Romans, or the arcuated system of the Mediævalists.

Than such movements and the criticism, English or Italian, that leads to them, nothing can be more mischievous; for the faith of the student in the truth and capability of the style, which it is calculated to unsettle, is essential to his progress; and architectural students are in vain exhorted to diligence and enthusiasm in the pursuit of their art when they are left in doubt by conflicting criticism what phase of it to pursue, or whether any phase of it is worthy of their acceptance. Faith is as essential in art as it is in religion; for "if the trumpet give an uncertain sound, who shall prepare himself to the battle?"

But for this criticism there would be little need of inciting to zeal in the fascinating study of architecture. As in religion, unshaken faith would be followed by love in the breast of the student for one or another of the styles of the day that solicit his attention, according to his natural or acquired predilection.

Though, on the other hand, there are not wanting critics who, from dissatisfaction with present practice, or late efforts at originality, counsel the mere adapting the old productions of this style to modern purposes, and even go so far as to suggest copying, I will not suppose that the descendants of the ancient Greeks and Romans,—men with more or less of the blood of Phidias and Praxiteles in their veins, for such are the modern Italians,—are ignorant of the right use of architectural examples to the architect, or unable to grasp the true principles of their combination. I cannot but suppose that Italy contains hosts of men with sufficient imagination,—the vital quality in all art and artists,—to fuse into other harmonious examples the same elements from which those elder buildings were composed; in other words, of making the same use of the elements so abundantly placed at their command that Sansovino and Palladio made; which does not need a succession of eminently gifted men. Men of ordinary abilities will suffice if they have any reasonable depth of artistic feeling, which gives a power and insight to the intellect it would not otherwise possess.

Ancient examples are to be neither copied nor adapted; both practices are unworthy of an architect. Those who recommend them forget, or are ignorant of the epochal, local, and ethnographic nature of architecture,—the relation it bears to its own age and country. Ancient buildings cannot be exemplars for all times and places. They are to be mentally dissolved and recombined into other forms,—decomposed and recomposed.

Nothing is more natural than for the Italians to adopt this columnar ordinance, for it is their own rightful property,—the bequest of their forefathers. Italian architecture is not strictly a revival or resurrection of the Græco-Roman architecture, as it is generally supposed to be, for that style never died at Rome, which, owing chiefly perhaps to the sacred character of the Pontiffs, preserved in a greater degree than any other city the traces of ancient civilisation. The night, it has been said, which descended upon her was the night of an Arctic summer. The dawn began to reappear ere the last reflection of the preceding sunset had faded from the horizon. A stream, narrow indeed, but pure, of that architecture came down embodied in the Christian basilicas at Rome, which are not Romanesque, but Roman, whence it issued into all the countries of Europe. Certainly it was not revived in the sense in which Greek literature or painting or sculpture was revived. Greek literature had been lost to Europe for centuries, and survived only among the Saracens and Eastern Romans, from whom it was first recovered in the thirteenth century. Greek painting had been lost till recovered by Cimabûé and Giotto from the Byzantine school; so had sculpture, of which Pisano was the modern restorer. But Græco-Roman architecture, alive from Classic times, was present in all its beauty at the capital of the world when it was wanted, and, blended with Italian Romanesque, contributed to the inspiration of the Venetian, Roman, Florentine, and other varieties of the Italian in the sixteenth century.

I can imagine nothing more natural or proper than the resumption of the ancient architecture by the Italians, nor than the general course which it took in Italy in the fifteenth and sixteenth centuries. Let us glance at its history. It is probable that Brunelleschi was the first to infuse a purely antique spirit into his works, among which may be cited the cupola of the cathedral of Florence, the erection of which opened the way to the greatest architectural

enterprises of modern Europe, the Church of the Holy Ghost, and the Pitti Palace in the same city. He was followed by L. B. Alberti, who emulated the achievements of his predecessor, and in some respects excelled them. The churches of St. Francesco at Rimini, and of St. Andrea at Mantua, with the Palace Rucellai at Florence, are among the best of his works. Michelozzo, a scholar of Brunelleschi's, and other Florentine architects, followed Alberti, and were seconded in developing and applying the style by Bramante, who had practised in the former one. The Belvedere Court of the Vatican, the Court of the Loggia, and the Sora Palace at Rome, are specimens of his graceful manner. Peruzzi showed greater freedom in the use of his materials, as witness the palaces Farnesina and Massimi at Rome, and was seconded by Antonio Sangallo and by Raffaelle, in whose hands and those of Michelangelo, Vignola, San Michele, Sansovino, Palladio, and others, the style of ancient Rome was restored in all its grace and grandeur, and so expanded by additional elements, in its application to new uses, as to be rendered a distinct style, and in some respects a more consistent one than its antique parent or prototype.

No trail of the serpent seems to have been descried on it by any one of the architects just named, and many of them were men of strong religious feeling. They probably remembered that it had been in the service of Christianity in the Basilicas before mentioned since the time of Constantine the Great, long enough to atone for its guilt, if it had incurred any, in the service of a false religion; if, indeed, they did not feel that there is a holiness in real architecture, as in all true art, which no alliance with heathenism or anything else could take away. Such was the course of architecture in Italy, and the career of its most eminent professors,—the greatest architects, painters, and sculptors of the most accomplished age of the world since that of Pericles.

Now, if the human heart and imagination is the immediate fountain of all poetry and art, it is exceedingly absurd to suppose that the artistic instincts of such men, including one I have not yet named, Leonardo da Vinci, who, being an architect, was also concerned in the movement, — a painter, sculptor, poet, the greatest intellect of the fifteenth century, and seemingly of universal and superhuman knowledge,—should have betrayed them into a wrong path,—a path in which originality and progress was impossible,—and that another galaxy of great artists should have blindly followed them. I conceive that such men would have gone right by the mere force of their imaginations, and have been more likely to make a stride in the right direction than to slide into a wrong one. I conceive that such men as Da Vinci, Michelangelo, and Raffaelle, whose names are almost synonymous with beauty and sublimity,—who had grasped the whole realm of design, and were almost the inventors of chiaroscuro in painting,—would leave examples of a proper union between the three arts, and advance the style in every respect as no mere architect could. We should remember that artists such as they, — of the highest order that ever appeared on earth, — have always uniform, well-balanced minds, with judgments commensurate with imagination. If it be argued that true architecture is that on which its authors have impressed the leading thought of the age, I answer, the revival of the productions of Classic antiquity was the great thought of that age.

But this style is greater than its examples; and its highest reach of monumental grandeur or utmost possibility is not to be judged by its most important embodiment,—I mean, of course, that most costly and ambitious structure ever reared to the honour of Christ,—St. Peter's Church at Rome,—which, from some cause or other, does justice neither to the capabilities of the style nor the genius of the great architects employed on it. The exterior, of which alone I am speaking, has not a single detached column about it, and is, therefore, deficient in relief.

This church has been overpraised both by Byron and Lamartine, the latter more extravagantly when he says that in St. Peter's Church Michelangelo has clothed the idea of God with all the beauty of which it was capable, which is not true. The front of it was susceptible of such treatment by means of colonnades as would have rendered it infinitely more beautiful. Never was the homely proverb, "Too many cooks will spoil the broth," more strikingly verified than in the design of the Pontifical Church of St. Peter. The least eminent of the architects employed on it ought to have produced a superior principal façade, which lacks those mighty and vigorous masses of shadow without which, as Ruskin justly remarks, no building can be truly great.

Great mistakes, I grant, may be attributed to many of the leaders of the movement, and to none more than to him whose name has become identified with Italian architecture,—Palladio, who, it is certain, has been over-estimated by many eminent critics, as Quatremère de Quincy, Hope, Beckford, and, strange to say, by the great poet and philosopher, Goethe, who represents him as ever seeking to embody some "great image which he carried in his soul," a scarcely correct notion of architectural generation. He too often forgot that the beautiful in architecture springs out of the useful, having left instances among his works of unbordered windows, and of the columnar order constituting the whole of the architecture, which could, therefore, be separated from the building, though the better principle had been exemplified in the Florentine school. Palladio, however, oftener pursued architecture in the right spirit, and has left works, in the true sense of the word, original. He had no notion of merely reproducing Roman buildings, nor even adapting them to his purposes, but strove to mould the antique elements into accordance with his own ideas. He seems to have begun his career with the persuasion that the style would stoop to the humblest purposes of life, and that in extending it to such he was only continuing the applications of their architecture begun by the ancients themselves. His predecessors probably considered it as fitted only for churches, palaces, and public buildings; but Palladio's varied works at once proved that its applications were unlimited.

But be his faults or mistakes what they may, they are no reproach to the style which was practised in his time, the productions of which, in not a few instances, while they are unlike any former works, and therefore original, are amongst the most successful structures ever reared for harmony and beauty of form, and refinement and elegance of detail; being the issue of a fruitful imagination under the guidance of a pure taste and sound judgment.

Brighter and more enchanting forms than any that have yet appeared may be embodied by it, brought from among the golden visions that lie mirrored in the fairyland of the imagination; especially of the gayer and more aërial kinds, which will be admitted by him whose eye, bodily or mentally, has ranged over the creations of a style which is an offshoot of it,—the Saracenic,—in various countries of the East, more especially the exquisitely lovely scenes of fairy splendour in Hindostan, which are frequently aided in their designed character by a material of such purity and brilliancy that the whole resembles a flood of moonlight.

More artistic and higher combinations of Greek and Roman elements than Palladio or his predecessors or followers thought of are possible, and, what is more, are really called for by utility in some of the highest class of works. The great defect of the trabeated system is, that it is only fit to form the façade of a building to be entered singly, or in single file, and will not form the lofty and broad entrance required by a palace or church, for processions, without injury to its beauty; and while the colonnade is necessary to the highest grandeur, the arcade is essential to a great entrance-door or gateway. It gives the largest single opening,—an opening as broad and high as can be required.

But I believe the two principles can be combined in the formation of a grand entrance consistent with artistic harmony and unity; that is to say, two colonnades may, with some careful management, be combined by means of a connecting archivolt springing from entablature to entablature, into one great and harmonious feature, embracing a central entrance, which may be as great and lofty as could be desired. The side intercolumnar spaces would be subsidiary entrances, and highly useful and pertinent; or, where not required for entrances, would form framework for sculpture. The breadth of entrance thus secured seems highly desirable in any public building, whether public processions are to be provided for or not; and the mode of obtaining it here suggested is worthy of consideration for its increase of combined fitness and beauty. It would be a new kind of coalition between the Greek and Roman or Romanesque styles.

The Italian style as it spread from Florence, where it rose, to Rome and Naples on the south, and to Venice, Genoa, and Milan, on the north, accommodated itself to the natural, political, and social peculiarities of each city; most notably to those of the sea-girt and sea-intersected Venice, and so became the chief ornament of that gem of cities. It showed it could breathe a still more northern air, that of England, wherein a few works could be found that, for purity, harmony, and appropriateness, will compare with any of a corresponding class in Italy; along with abundant proof that no elements will so satisfactorily weave into the continuous houses or shops we require in our streets, with regard both to convenience and beauty. Indeed, its merit and value lie not in its sageness and beauty only, but in its organic vitality and possession within itself of the principle of future expansion and application to all the multiform and accumulating demands of human life. It will as truthfully form the features rendered needful by rain and wind and cold as those required by sunshine and heat; in other words, it is a Northern as well as a Southern style.

It will, doubtless, form in perfection every species of public and private edifice called for by the various institutions of every country of Europe, including engineering buildings, bridges, viaducts, &c., along with strictly architectural ones, without sullying its Classic purity, and render them musical as is Apollo's lute; for those columnar elements are susceptive of the utmost grace and refinement of which structural art is capable.

Such failures as the exterior of the British Museum are no disparagement of the style, for that is a magnificent display of its elements, which, owing to timidity, or want of imagination in the architect, were not worked up into a design. It is not answerable for that, nor for another remarkable instance of undigested material, which, in justice to architecture, should be pointed to, viz., the new Houses of Parliament at Vienna, a view of which was given some four years ago in the *Builder*, and now, I presume, approaching completion; which is nothing more than a number of decorated blocks of building in mechanical conjunction, which, though forming a magnificent architectural group, have no claim to be considered a work of art.

Nor are those modern buildings, which are externally reproductions of the Greek peripteral temple, such as the Town-hall at Birmingham, the Church of the Madeleine and the Bourse at Paris, the Walhalla at Bavaria, to be considered as anything but libels on the character and resources of the style, which is capable of infinite variety on the Greek type, and greater display of columnar richness and grandeur. The periptery, unless redeemed by Parthenon-like perfection of line, by variation of capitals in the same façade, and high-class sculpture in the pediments and friezes, is a monotonous spectacle. Klenze in the Walhalla could have produced a national temple that would, in point of composition, have been an advance upon it.

What in each country this style requires is to be made as much as possible to form, not adorn merely, windows, doors, porches, chimneys, and other features required by the climate, in emulation of the Gothic, which grew up and around,—identified itself with,—essential features, as in the window, which was the most useful feature, and became the most beautiful, the useful and beautiful growing up in conjunction; which must be always the most pleasing, like that rarity a virtuous mind in a beauteous body. As to the chimney, it seems a providential provision for relieving the sky-line, and giving intimation without of the home-life within.

The so-called Queen Anne movement, in search of greater picturesqueness, seems to me to be uncalled for. Holland is useful to feed the imagination of the architect, which must ever be indebted to reminiscence,—a fact the ancients meant to indicate by representing the Muses as the daughters of Memory. Inspection of the picturesque buildings of Holland is calculated to make his own mind more prolific. They are seed cast therein to bear fruit in his own works. But with the highest reverence for the art-genius of the Dutch of the seventeenth century, (most brilliantly manifested, however, in painting), I think it is unworthy of English architects to introduce and set up here a style from Holland. It is, to say the least, going to the

huckster's shop instead of the warehouse for our provisions.

If we are as truthful and independent in our treatment of the columnar architecture, in acclimatising and nationalising it, as were the Dutch architects, and withal pay due attention to the securing a good and lively outline, and light and shade in designing, and are careful ever to make a beauty of necessity, we shall be sufficiently picturesque. Time and weather, and accident are agents in the production of that extreme degree of picturesqueness which the landscape-painter delights in; and their effects are not to be anticipated by the architect.

When I contemplate the beauty and capacity of the style in question, and of the styles descended from our forefathers in their respective embodiments,—the result of the highest efforts of the wisest nations in the way of architecture, forming a mine of elements such as neither Greek nor Roman ever knew, and put into the hands of all by means of engraving and photography, I feel more disposed to exclaim, in the words of the Psalmist, "The lines have fallen to us in pleasant places, and we have a goodly heritage," than to complain of the want of a national style. For if these are not our national styles whose are they? A question history is best able and has most right to settle, and she intimates, I think, clearly that in working in an adapted or modified Italian style we are truly succeeding and following the great nations that have preceded us in civilisation,—Egyptian, Etruscan, Greek, ancient and modern, Roman, Venetian, Pisan, and Florentine,—in the way we should go,—the providential way, with increased and accumulating means and opportunities of arriving at successful issues. Our difficulty seems to me to be not in having no national style, but in having two national styles,—the style we inherit from Classic antiquity along with its civilisation, and that bequeathed by our forefathers,—a style to which many hearts cling, and not without cause. We have two phases of architecture, so beautiful that we cannot turn our backs upon either, and may say, in the words of Gay's "Beggars' Opera":—

> "How happy could I be with either,
> Were t'other dear charmer away!"

and I question whether any former nation would not have felt and acted in like manner.

If the Gothic would borrow a little more of Greek refinement from her Oriental sister, the Byzantine style, of which she is highly susceptible, and fully recognise the change in the world and in her own circumstances since she fell asleep in the sixteenth century; and if the Classic at the same time were fully nationalised, they would assimilate so far that there would be but little discord in our towns arising from the pursuit of both.

Whether they would or not, neither Gothic nor Classic can ever be abandoned in favour of a new style; for no new style will ever be invented or generally followed. We had better, therefore, accept that fact, and pursue the styles we have, which, indeed, seems the providential course. Each style, however, should have its separate followers, as no man can with heart and soul follow both; and the student should be taught to make choice of one or the other, which would be most favourable to his growth in artistic feeling and power. It was, therefore, wise in the Royal Academy Professor in his recent lecture to discourage the following a plurality of styles. Inigo Jones was, doubtless, right in appending a Corinthian portico to old St. Paul's Cathedral. He could put some feeling into that, but he could probably have put none into a Gothic porch, and a living dog is obviously better than a dead lion.

I conceive of architecture, like the graceful figure of her on the tomb of the Italian architect Sada, engraved in the *Builder* not long ago, as flourishing in the bloom of an immortal youth and beauty,—for such the rose of juvenility must intimate on the brow, pensive though it be, of a lady who, if her first advent on earth was in Egypt, and the sanctuary of Karnach was her firstborn, must be over 4,000 years old. I grant that she has betrayed great eccentricities within the last century, not only in England and the North, but in Italy, the birthplace of her most illustrious modern followers. But I strongly suspect that her aberrations are in a great measure owing to the conflicting opinions and advice of her councillors (the critics), whose utterances have been, in too many instances, merely empirical, and too seldom based on the spiritual and emotional nature of architecture and art. Instead of trying to breathe into her some sparks of her ancient fire, by reminding her of her glorious antecedents and achievements, and especially of her labours of love in ancient Greece and in Mediæval Europe, through which she has helped the cause of civilisation in the world, and even exalted the idea of religion, they have of late been prophesying evil against her, insinuating that she is in a decline, and all but defunct; one, otherwise an eloquent and judicious critic, even talking of mourning in sackcloth and ashes over her degradation. A glance over the chart of her history will show that she is, like ourselves to a great extent, the creature of circumstances,—the sport of accident; and if so, surely no circumstance, no accident, can be more injurious to her than such conduct on the part of her friends, concerning whom she might well, with the ancient Roman, cry out to the Gods, "Oh, save me from my friends!"

What she has once done she can do again. The aliment on which she lives is as nourishing and the fountains of her inspiration are as lofty as ever they were, and more unfailing. Of a soul-born, spiritual substance, she is necessarily indestructible, and exempt from the common lot of obsoleteness:—

> "Age cannot wither her, nor custom stale
> Her infinite variety."

Like her sisters, Poetry, Painting, and Music, she has fresh fields and pastures new and delightful for ever stretching out before her, through which she may

> "Still walk in beauty like the night
> Of cloudless climes and starry skies."

But I have long been of opinion that her gait and mien would be more majestic if she were not so much perplexed with matters which do not properly belong to her, and which might very well be intrusted to another and more material agent, called Practical Building or Construction, who would be held responsible for the faithful and durable embodiment of her images of beauty. She should be on intimate terms with, nay wedded to, Constructive Science, and her conceptions should be the fruit of the union; but beyond the full mental development of every part of her offspring as to form and hue in all their minutiæ, she should not be expected to operate. All the rest ought to be left to her deputy or subordinate, Practical Building, educated expressly for the post, who should govern and direct his invaluable servants,—Masonry, Bricklaying, Carpentry, Joinery, Plumbing, &c., and become answerable for their honest service. I do not mean that she (Architecture) should shirk any mind or heart work whatsoever, but simply relieve herself of all that is merely mechanical, and that could be as well or better done by another, and reserve her strength for higher work.

I know nothing more that is wanting beyond what I have directly or indirectly pointed out to render her winter of discontent a glorious summer but sincere and earnest followers who, like Michelangelo, would work for the love they bore to her, and not merely for the gold they could wring from her. Some gold they must have, and some gold she will doubtless give them, but the "accursed thirst of gold," as the prince of Latin poets calls it, must not be their inspiration. It is not too much to say, "We cannot serve her and Mammon," a truth which it is important for those who have her interest at heart, and are anxious to remove all stumbling-blocks from her path, to bear in mind. A community of her true followers, wheresoever born, bound together by sincere attachment to her for her own sake, would constitute the true modern Freemasonry, and be a worthy successor to the Mediæval; the proper successors or continuators of the Freemasons being surely architects and skilled and scientific builders, architectural sculptors and carvers, and even earnest foremen and workmen, rather than the miscellaneous fraternity (miscellaneous as regards individual professions) that now bear the name.

Than such a community of various ranks of earnest men, each pledged and incited by every high consideration to the service of their beautiful mistress, through evil report and through good, nothing, I think, would be better calculated to meet the present exigency, and awaken in the profession, or at least in the breasts of all susceptible of it, some sparks of the pure religious-and-art spirit under which the Mediæval Freemasons worked; while the achievements of the Freemasons, and Greeks, and Italians,—that is, architecture in its highest examples and possibilities,—would be likely to seize upon and enflame their imagination, and become an ideal standard of aspiration. Such an institution would, like chivalry, have a purifying and elevating influence on the character of each member.

Within such an institution I can imagine the workman sympathising in the emotions of the architect, and having an æsthetic part in the adornment of his works.

Samuel Huggins.

SANITATION IN ANCIENT ROME.

As we pointed out in a recent article* on the architecture of modern Rome, there is every probability of Italian art becoming a thing of the past, especially if, as seems to be the case, the deterioration so noticeable on the Tiber should extend itself from one end of the Italian Peninsula to the other. Modern Italian architects and artists appear to be far behind their glorious predecessors, who have made their works serve for imitation to many generations of artists. But modern Italians have also deteriorated, compared with their forefathers, in other domains of what constitutes civilised life. This remark applies especially to the question of sanitation. We know, at least travellers very often do to their cost in the loss of health, that in sanitary matters Italy does not occupy a very high place; and from a lecture recently delivered by Professor Uffelmann, of Rostock, it appears that in this respect they are not nearly on the level occupied by the ancient Romans. To do them justice, however, it ought to be added that, for that matter, they are no worse than other nations, who very often are behind their ancestors in a good many things, and might well learn from them. At present, however, we have only to deal with Rome; and from the lecture to which we have referred, and which throws much light on a subject hitherto very little known, it appears that in ancient Rome, the metropolis of former times, there existed important institutions for preserving health amongst its inhabitants.

Although there were then at Rome no sanitary inspectors, in our modern sense, the Ædiles and Censors were charged with sanitary functions. It was the Emperor Augustus who first appointed inspectors of water-supply and superintendents of sewers, who exercised a sort of police supervision also over the river of the city, the Tiber. The city of Rome was early provded with a system of sewers, which at first, at the time of King Tarquinius Priscus, only had the object of draining some parts (amongst them the Forum) of the city, but which later likewise served the purpose of modern sewers, that of receiving and carrying away all descriptions of refuse. Under Tarquinius Superbus this system of sewerage was completed by the construction of the Cloaca Maxima (the largest sewer), leading to the Tiber, which still exists, and, whatever be the difference of opinion as to the provision of large sewers, may well rank with the best sewers of our time, so far as regards excellence of construction. For five centuries this system of sewerage was carefully preserved, extended, repaired, and cleaned. But with the decline of the city this great work was permitted to fall in ruins, and only the principal sewer remained, which has been preserved down to our day, but choked up by mud, and at its end towards the Tiber filled up to two-thirds its height.

The second fundamental condition for the preservation of the public health, that of providing the city with an abundant supply of good water, was done full justice to in ancient Rome. When the water in the Tiber, in consequence of its contamination by the population inhabiting its banks, could no longer be used for drinking, the Censor Appius Claudius constructed an aqueduct, for the greater part underground, from Praeneste to Rome, which called after him the Aqua Appia. Fifty years later this was supplemented by a second; and, after other seventy years (144 B.C.), by a third aqueduct, the Aqua Marcia. The latter brought the water from the Sabine Mountains, was thirty-two miles long, and supplied excellent water, which for centuries refreshed thirsty Romans, and which was originally constructed at a cost of 2,000,000*l.*, an enormous sum at that time. It was in ruins for many years, but

* See p. 288, *ante*.

was restored ten years ago, and has since then furnished Rome with its water supply. Numerous other aqueducts, some of them very magnificent and gigantic, were built. Towards the close of the Empire, nineteen aqueducts, fourteen larger and five smaller ones, conducted the water to the metropolis. At the end of the first century after Christ, ten aqueducts supplied a daily quantity of 33,000,000 imperial gallons of water to Rome. As four-eighths of this volume were used by the Thermæ, or public baths, and one-eighth by the imperial palaces, there remained yet three-eighths for the use of private consumers, the quantity supplied to the two million inhabitants of the metropolis being sixty-two imperial gallons of water per head per day for domestic use. The water was conducted through the city in leaden or earthenware pipes. The aqueducts were fully protected by law. No buildings could be erected over them, no trees planted near them. Heavy punishment was inflicted on persons polluting the water or damaging the aqueducts or conduits. With the decline of Rome, those splendid institutions also fell into ruins; but they were partly destroyed by hostile armies or besieging forces, in order to compel the Romans to surrender their city.

Public baths reached a state of perfection in Rome such as has not been attained by any other nation. At first, of course, only the Tiber formed a natural basin for ablutions; later artificial public baths were constructed, and under the emperors the Thermæ were introduced. Those magnificent bathing establishments not only furnished cold, warm, and hot baths, but they supplied also shampooing baths and cold ablutions; anointment of the body was likewise practised there. Those institutions still serve in many cases as patterns for baths erected now for our well-to-do classes, but which at that time existed in incredibly large numbers, the use of them being, besides, free to all comers. But those establishments did not bring with them the unmitigated advantages it was probably at first thought they would furnish; they degenerated, and became the abodes of idleness and hotbeds of vice.

There was no want of regulations in ancient Rome as to height of houses and width of streets. When, after the great fire, under Nero, the city had to be rebuilt, regulations of this description had to be strictly followed. There was likewise an abundance of public places of amusement, walks, and public gardens. The government also looked to the supply of provisions, its solicitude at first being merely confined to taking care that a sufficient quantity of corn was continually stored in Rome. Many descriptions of food,—for instance, meat,—were also inspected. Of the stored grain, large quantities were given away to the poor since the time of Cæsar; during the reign of Pompey very nearly 1,000,000*l.* was spent for this purpose annually.

There existed many charitable institutions, although there were few of them according to our notions. The Emperor Nerva sank large funds, the interest of which was applied in supporting the children of poor parents and orphans. Trajan placed nearly 5,000 children on the list of recipients of corn. Antonius Pius founded an institution for poor girls. Hospitals did not exist very early; they sprang up under the influence of Christianity, their number amounting in the ninth century to over twenty. Nothing was done in the direction of public care for the poor until the middle of the second century after Christ. Antonius Pius appointed communal physicians, who were free from taxes, but who were under the obligation of rendering certain services to the state and the commune, and who had, among other things, to treat gratuitously all the poor of their respective districts. Alexandrus Severus was the first to pay them a salary, and gave them the name of *Archiatri populares*.

The ancient Romans did not permit the industrial classes to poison the air for them. Fullers, who used urine in a state of putrefaction in the manufacture of cloth, had to carry on their calling outside the city gates or in its remote quarters. Roman law-makers had a watchful eye on the disposal of the dead. At first deceased persons were interred inside the city; later those interments were prohibited, and a public cemetery was laid out outside its walls. Funeral funds existed very early in Rome, which paid, as in our time, a fixed sum at the death of a member if the latter had subscribed regularly. Cremation was introduced in the time of the Decemvirs, at first only in the case of individuals, but later, after Sulla, cremation became more common. At one time this was the general mode of disposing of the dead, but committal to the soil was never entirely abandoned, and with the spread of Christianity became again more general. But in the beginning of the second, during the third and fourth, and the beginning of the fifth centuries, the Christians used the subterranean cemeteries, the so-called Catacombs, in which the bodies were placed in hollows cut in the walls of the passages driven through the tufaceous limestone underlying Rome, the cavities being afterwards closed by marble slabs, on which the names of the deceased were engraved. In time these catacombs became more and more complicated.

From the above it will be seen that the institutions and hygienic regulations of the ancient metropolis were very remarkable, and in some respects at least much more perfect than at the present day in many cities and towns the inhabitants of which think a great deal of their sanitary arrangements.

THE ROMAN CAMP OF BONNA ON THE RHINE.

The excavations which have been carried on very quietly near Bonn, at the expense of the Provincial Museum of that town, and under the direction of Dr. E. aus'm Weerth, and which had the object of laying bare the Roman camp of Bonna, established a short time before the beginning of our era, have been crowned this year with well-deserved success. With the assistance of Herr Koenen, sculptor, of Neuss, and one of the editors of the *Organ für Geschichte und Alterthumskunde von Düsseldorf und Umgegend*, the above-named explorer has, within a comparatively short time, succeeded in exposing not only the complete remains of the *Porta principalis sinistra* and parts of the enclosure-wall joining on to it, but also the remains of the *Porta principalis dextra* and remnants of the *enceinte* forming the eastern boundary of the camp. Owing to his exertions, full light has now been thrown on the position, camp form, and arrangement of this great military station. It formed a square with sides 1,706 ft. long and rounded-off corners, and was surrounded by a wall 6 ft. thick, a ditch 56 ft. wide, and an outer rampart of a width of 29 ft. 6 in. A rampart, 29 ft. 6 in. thick, abutted on the inner flank of the enclosure-wall, along which, for the whole circumference of the camp, the *Via angularis*, 18 ft. wide, could be traced. Besides this road there were three others, the *Via prætoria*, the *Via principalis*, and the *Via quintana*. Each of them terminated at either end in a corresponding gate. These gates were,—the *Porta prætoria*, which lay close to the Rheindorferweg, close to the south-east corner of the Jewish cemetery; the *Porta decumana*, found in the same line, south of the road "An der Esche" (north of the Rosenthal); the *Porta principalis dextra*, which was laid bare on the Viehweg, in front of the Wichelshof; the *Porta principalis sinistra*, discovered in the same road, east of the Rheindorferstrasse; and, finally, the remains of foundation, probably, of a northern tower, forming the termination of the *Via quintana*, on the road leading to the Rhine between the Viehweg and the Rosenthal. The *viæ* of the castrum are bordered by large buildings, of which several have already been disclosed, as well as a complete system of canals. The arrangements of the various parts of the camps show that it was a military station of the first rank. For instance, no *Porta principalis sinistra* has hitherto been discovered which can compare in size with that of Bonna. It is a double gate, of about 26 ft. wide, flanked by two heavy square towers, each 37 ft. 6 in. long, and 29 ft. 6 in. wide, and the enclosure wall abutting on to them on their outside. The several walls have partly a thickness of about 7 ft. The material used for them and the other structures of the castrum is tufa. Professor aus'm Weerth must certainly be congratulated on the completeness of his archæological discoveries, doubly interesting on account of their close connexion with the history of the civilisation of the Rhine country, which may be said to have commenced with the Gallo-Roman and Germano-Roman campaigns. A hope is expressed that further means will be supplied for completing the investigations which have been so successfully carried on thus far.

THE HOLLOWAY COLLEGE, EGHAM, SURREY.

Not far from the Virginia Water Station of the London and South-Western Railway, two remarkable establishments are in progress of completion at the cost of Mr. Thomas Holloway, and which he proposes to present to the nation. Including endowments and fittings the expenditure will be little short of a million sterling,—certainly a noble gift. One of these is a Sanatorium, for curable cases of mental disease,—a building already partially illustrated in a previous volume of the *Builder*. The other, at some little distance from the Sanatorium, in the direction of Egham, is a college for the higher education of women; and of part of this we give a view in our present issue. It stands in an area of 95 acres of freehold land at Mount Lee, and has a frontage to the high road of about three-quarters of a mile, close to Windsor Great Park. The college buildings, already far advanced, are set back from the road upon an elevated plateau commanding a superb view of the surrounding country, and surrounded by pleasure-grounds, extensively planted and intersected with groves, streams, and lakes. The designs for the construction of the building, approved by Mr. Holloway, were made by Mr. W. H. Crossland, architect, who is now superintending their execution. The style is that of the French Renaissance, in which sculpture enters largely into the design, and here Mr. Crossland has had the able assistance of Mr. Fucigna.

Holloway College is of enormous size. It forms a double quadrangle 500 ft. from east to west, and 350 ft. from north to south. The main portions, which run from east to west on each side, consist of five floors, each 10 ft. 6 in. high, all of which (with the exception of the western portion of the lower floor, arranged as store-rooms) are rooms for students, professors, and class-rooms, connected by four spacious stone staircases placed equi-distant, two in each wing. The building is laid out to provide ample accommodation for 350 students, and each student will have two rooms, arranged as bed and sitting rooms, each 13 ft. 6 in. by 10 ft. 6 in., and divided by corridors 10 ft. wide and 500 ft. long on each floor. The professors and heads of departments will have rooms in the central and corner pavilions, which are slightly larger in area. There are three class-rooms also in the corner pavilions, each 28 ft. by 16 ft. on the ground floor, together with a lecture-theatre, 42 ft. square by 18 ft. high. The three cross buildings running from north to south have been arranged as follows:—That on the west front comprises the chapel, 130 ft. long by 30 ft. wide and 30 ft. high, and a recreation-hall 100 ft. long by 30 ft. wide and 30 ft. high. These two apartments have a spacious driving gateway between them, carried up through two floors, and leading into the upper or western quadrangle. The gateway is surmounted and surrounded by suites of rooms for chiefs of departments, arranged five on each floor, with porters' rooms, &c., all approached by stone staircases, the whole being crowned with a clock tower, rising to a height of 130 ft. from the ground.

The cross building between the two quadrangles will contain on one side the dining-hall, 104 ft. by 30 ft. by 25 ft. high, and on the other side the kitchen, 80 ft. by 30 ft. by 25 ft. high, together with cooks' rooms, stores, and surgery, &c. The centre between dining-hall and kitchen is occupied by an octagonal tower, 100 ft. high, containing on the ground-floor a central hall 35 ft. in diameter, approached from each quadrangle by flights of steps, as well as from cloisters and the terraces over them, which run the whole length of this building on each side from north to south. The upper part of the octagonal tower above the roof-line contains two series of low-service cisterns for supply to main buildings and hydrants. The floor under the dining-hall is laid out as servants' rooms, and that under the kitchen as stores, with large entrance-hall between, entered from either quadrangle. The cross building on the east front, also running from north to south, contains, on the lower floor, the tradesmen's driving gateway in the centre, 48 ft. by 17 ft., on the left of which is a gymnasium and racket-court, each 50 ft. by 30 ft. by 16 ft. high, with lavatories, &c., adjoining, with library on the floor over 100 ft. by 30 ft. by 30 ft. high. On the right of the gateway will be two large music practice-rooms and twelve small piano-rooms, with museum and picture-gallery on floor over, 100 ft. by 30 ft. by 30 ft. high. The

driving gateway in the centre of this block will have suites of five rooms on each floor over for heads of departments, reached by a spacious stone staircase, and the whole surmounted by a bell-tower 140 ft. high. The three cross buildings are approached from the main buildings at each end as well as from the quadrangles, cloisters, and terraces in the centre.

The contract with Mr. John Thompson, of Peterborough, was signed on the 30th of July, 1879; and the building has now been in course of erection for two years, and rapid progress is being made, the contractor having agreed to have the whole finished and delivered up in four years from that date for the sum of 257,000*l.* This amount is exclusive of fittings, furniture, &c. Extensive plant and machinery are employed on and about the works, and about 800 men are constantly at work.

The constitution of the college, to be embodied in a trust-deed or charter, will set forth that the college is founded by the desire and counsel of the founder's wife, now deceased, and that its object is to afford the best education suitable for women of the middle and upper-middle classes. The trustees are to be a corporate body, with perpetual succession, and to have all the usual powers and privileges. The governing body will consist of twenty-one persons, to be appointed partly by the University of London and partly by the Corporation of London, and it is stipulated that a certain portion shall always be women. Religious opinions are not in any way to affect the qualification for a governor. It is the founder's desire that power by Act of Parliament, Royal Charter, or otherwise, should be eventually sought to enable the college to confer degrees after due examination; and that until such power is obtained, the students shall qualify themselves to pass the Women's Examination of the London University, or any examination of a similar or higher character which may be open to women at any of the existing universities of the United Kingdom. The curriculum will not be restricted to subjects enjoined by any existing university. Instead of being regulated by the traditions and methods of former ages, the system of education will be mainly founded on studies and sciences which the experience of modern times has shown to be most valuable, and as best adapted for the intellectual and social requirements of students. The governors will, therefore, be empowered to provide instruction in any subject or branch of knowledge which shall appear to them, from time to time, the most suitable for the education of women; and the curriculum of the college will not discourage students who may desire a liberal education apart from the Latin and Greek languages. Proficiency in classics is not to entitle students to rewards of merit over others equally proficient in other branches of knowledge. It is intended to provide twenty founders' scholarships, of the value of 40*l.* each, tenable for not more than two years in the college. No professor will be required to submit to any test concerning his or her religious opinions. The founder declares that, "having witnessed the hand of God in all things," it is his earnest desire that the religious teaching of the college should be such as to impress most forcibly on the mind of each student her individual responsibility, and her duty to God. Students will have the right to attend the services of the Church of England, or of any sect or denomination which their parents or guardians may desire. The domestic life of the college is to be that of "an orderly Christian household," with a daily simple service, the reading of a portion of Scripture, and a form of prayer approved by the governors. The Principal of the college will be a lady, and duly qualified lady physicians and surgeons are to be resident in the college. Other important articles in the proposed constitution of the Holloway College are that the lady principal shall, with the sanction of the governors, make from time to time, such provisions as might be expedient for the conduct of public worship on Sunday in the college chapel, but no permanent chaplain shall be appointed, and no arrangement shall be made which would identify the college in any way with any particular sect or denomination of Christians; that no other church or chapel, or place of worship, shall at any time be built on any part of the college estate, as a very large, handsome, and suitable chapel, with a fine organ, will be provided in the college building; that all the students shall reside in the college; that no house for any professor, teacher, chaplain, or minister, shall now or hereafter be built on any part of the estate; that no student who does not permanently reside, during the college terms, in the college, shall be permitted to receive instruction there. It is also provided that each student shall have for her separate use two rooms, which shall not be shared with any other student, and that students' residence at college shall be restricted to four years, unless, under special circumstances, an extension shall be sanctioned by resolution of the governing body. It has also been decided that no student shall at any time be admitted to the college who has not attained the age of seventeen, or who has not passed a satisfactory examination. The examination for admission shall be regulated from time to time by the governors, but shall, except as hereafter provided, never fall below the following standard:—The English language, composition, and history; the elements of Latin, French, or German, or some other foreign language; arithmetic, integral and fractional; the elements of some one branch of mathematical or physical science. Candidates who may have passed the senior local examination at Oxford or Cambridge, or the matriculation examination of the University of London, or such other examination by some competent and public authority as, in the judgment of the governors, is equivalent to such University examinations, shall be admissible to the college without further examination. Provided always, that during the first seven years after the opening of the college, the governors shall be at liberty, in special cases, to relax the above-named conditions, and to make such regulations for the admission of students as they deem expedient. The lady principal is endowed with almost absolute power, subject to the approval of the governors, but she also must conform to sundry regulations. She must not marry, on pain of disqualification; and on attaining the age of sixty she must resign, like all other professors in the college.

Mr. Holloway, amongst his other good works, contemplates the formation of a picture gallery in the college, and the paintings he has already purchased for the purpose show that it will be a collection of no common kind.*

The illustration we give is a reproduction of a drawing exhibited recently at the Royal Academy by the architect.

THE TOMB OF PRINCE JOHN.

Prince John, second son of Edward II., was born at Eltham, in Kent, on Ascension Day, 1315. The year after his father's assassination he was created Earl of Cornwall by his brother, Edward III., at a Parliament held at Salisbury.

In the year 1333, a proposal of marriage was made between him and Joan, daughter of Ralph, Earl of Eu, and in the following year another with Mary, daughter of the Count of Blois; afterwards a marriage was arranged with Mary, daughter of Ferdinand, king of Spain, in 1334, for which an agreement was drawn up; but the Prince did not live to fulfil the engagement, for in the month following, while in Scotland, he died, at St. John's Town, Perth, aged 19.

By the express orders of the king, he was to be buried *entre les royals*, yet so as to leave room for the king and his successors. This was fulfilled by his being laid in the quasi-royal chapel of St. Edmund, in Westminster Abbey. The body was removed with much pomp, and the funeral was so stately and magnificent that the then considerable value of 100*l.* was placed upon the horses and armour offered there on the day of his burial.

The tomb has a moulded base and panelled plinth of stone; above the plinth are panels of alabaster, each of which contained a small alabaster figure, with a dark back-ground, which Mr. Burges describes as slabs of black slate.

The cornice, with carved enrichments, is also in alabaster. The upper slab is of Purbeck marble, and the effigy is of alabaster.

In "Gleanings from Westminster Abbey," Mr. Burges describes the effigy as being "an exceedingly curious and valuable specimen of military costume. . . . . We see the curious garment, the cyclas, cut so much shorter in front than behind, then beneath it the gambeson, then the coat of mail, and lastly the haquetон.

The sword-handle is also very beautifully sculptured, and the shield is a very valuable example of heraldic drawing. . . . The little figures of weepers are open to the criticism of being placed in exaggerated attitudes, while the heads and hands are too large. The figures are all crowned and are excellent studies of costume."

In Neale's description of the tomb he says that the "effigy is in plate armour with a surcoat, a gorget, and a round helmet encircled by a coronet. The coronet of this earl is of the ducal form, viz, having alternately small and large trefoil leaves; he is said to be the first person whose coronet is so represented. On his left arm is a beater shield charged with his arms, viz., three lions of England, with a bordure of fleurs-de-lys."

The tomb was originally surmounted by a very fine stone canopy divided into three bays on each side by buttresses, which were carried up from the ground, terminated by crocketed pinnacles, the centre ones being higher than those towards the ends of the tomb. Each bay had a pointed arch with cinquefoil foliated cusping carved, and smaller secondary cusping, and was surmounted by a gable with crockets and figures as finials. Each tympanum was pierced by a circle with quatrefoil cusping and smaller cusping similar to the arch below; all the spandrels were also pierced and cusped. Upon the canopy and over the centre of the tomb was a pyramidal crocketed spire with angel figure as a finial. The soffit of the canopy was richly vaulted.

In the year 1775, at the funeral of Lady Elizabeth Percy, Duchess of Northumberland, the crowd that had collected to see the funeral was so great that the clergy and choir scarcely could make their way. Just as the procession reached St. Edmund's Chapel, the screen, together with a part of the canopy, of this tomb fell, bringing with them men and boys who had climbed on them. The confusion was so great that the Dean did not return to complete the service till midnight.

The canopy was wholly removed about fifty years ago by order of Bishop Pearce, then Dean of the Abbey.

My drawing represents the tomb in its present condition. W. B. Bassett-Smith.

*1. Trentside (Creswick)	£2,100	0 0
2. "Man proposes, God disposes" (Landseer)	6,615	0 0
3. Bast e of Reverdo (Clarkson Stanfield)	3,1[illegible]	0 0
4. Pa[illegible]n Mill (Clarkson Stanfield)	2,677	10 0
5. Two Princes in the Tower (Millais)	3,900	0 0
6. Princess Elizabeth, daughter of Charles I. in prison at St. James's (Millais)	3,150	0 0
7. Landscape and Cows (Cooper)	273	0 0
8. Landscape and Sheep (Cooper)	946	0 0
9. Hawkwater Fell	273	0 0
10. Travellers in Storm (Copley Fielding)	3,150	0 0
11. Borrowdale (Collins)	2[illegible]	0 0
12. Tomb in the Water (Matter)	2,362	10 0
13. Verona (Hunt)	913	10 0
14. Old Crouie	570	0 0
	£32,690	10 0

OATLANDS SCHOOL, FOR WALTON-ON-THAMES SCHOOL BOARD.

The design for this building was selected in a limited competition including designs submitted by two other architects.

Accommodation is provided for 133 boys. The school-room is 57 ft. long by 20 ft. wide. The class-room is 57 ft. long by 15 ft. wide. Both rooms have open-timbered roofs. The master's house contains a living-room, 12 ft. by 12 ft. 6 in., with bay-windows; kitchen, scullery, and three bed-rooms over.

The school and class rooms are to be warmed by means of Mr. D. O. Boyd's hygiastic ventilating stoves. Ventilation is specially provided for by means of inlets in the angles of the rooms, and in each window-back; and outlets into an air-chamber in the roof; the upper parts of the windows also open.

Externally, the building will be faced with red Claygate bricks, relieved with timber work and tile hanging.

The roofs are covered with local dun-coloured tiles.

The contract has been taken by Mr. Frederick Peters, Jun., builder, of Oatlands Park, Weybridge, for the sum of 1,256*l.*

The architect is Mr. Rowland Plumbe, of No. 13, Fitzroy-square.

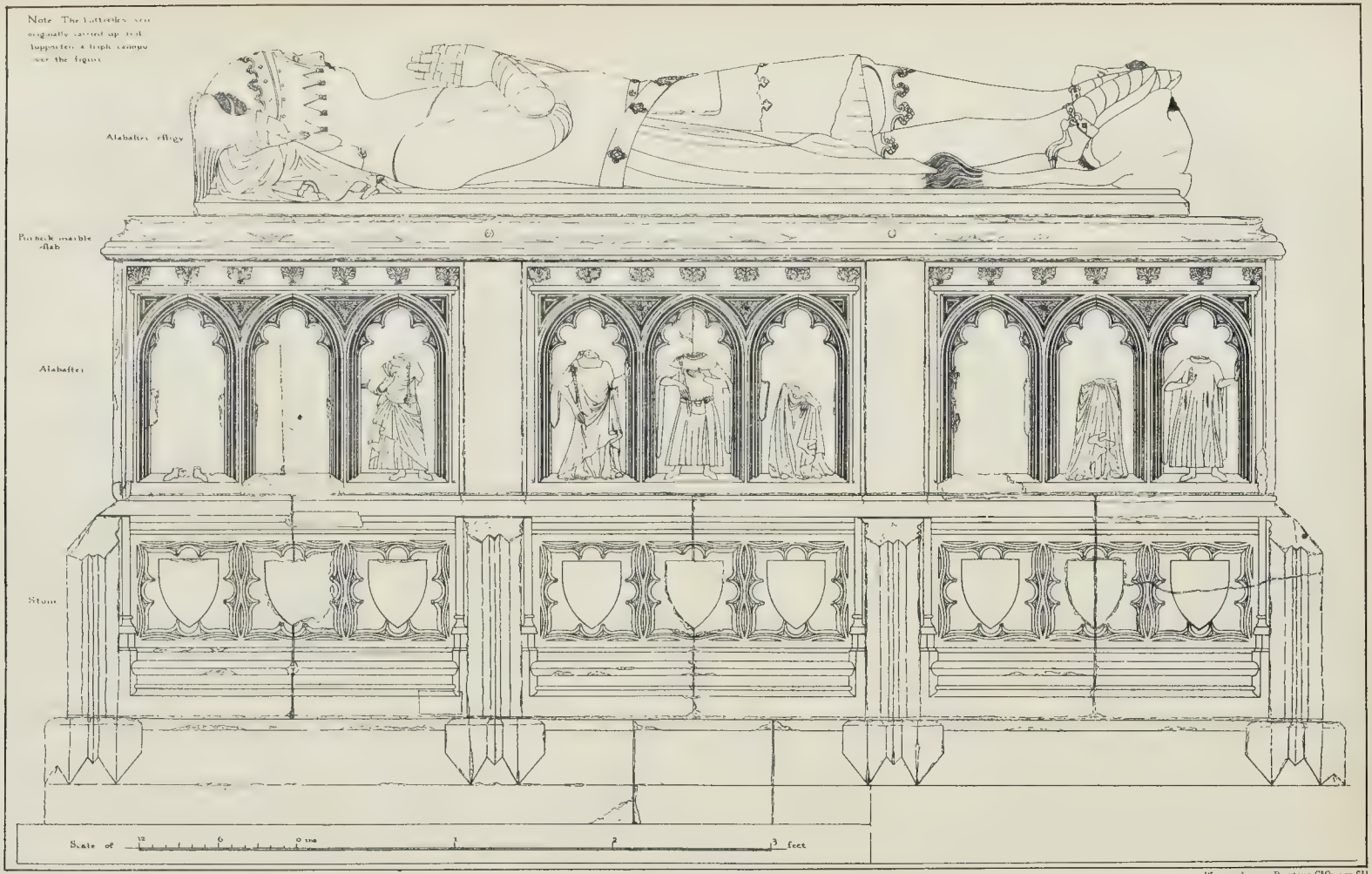
Iron and Steel Institute.—The reception committee have issued cards for a *conversazione* at the South Kensington Museum on Thursday, the 13th inst.



INTERIOR OF THE CHURCH



. SOPHIA, CONSTANTINOPLE.



C F Kell Photo-Litho London E C

THE TOMB OF PRINCE JOHN, WESTMINSTER ABBEY.

Wyman & Sons Printers G^t Queen S^t





THE HOLLOWAY COLLEGE, MOUNT LEE, EGHAM, SURREY.

N.E. Entrance to Students' Stairs, from East Quadrangle.

Mr. W. H. Crossland, Architect.



OATLANDS SCHOOL, FOR WALTON-ON-THAMES SCHOOL BOARD.—Mr. Rowland Plumbe, Architect.

Wyman & Sons Printers Gt Queen St

THE SOCIAL SCIENCE CONGRESS IN DUBLIN.

THE PRESIDENT'S ADDRESS.

Lord O'Hagan, in the course of the address with which, on Monday last, the proceedings of the twenty-fifth annual Congress of the National Association for the Promotion of Social Science were opened, spoke as follows in reference to Health questions:—

I pass on to tell you what has been done, since 1861, in a department not less important than any other within the range of your inquiries,—the department of public health. In that year Ireland had, as its chief sanitary authorities, expiring parish vestries, clothed with antiquated powers, which had been vested in them so far back as the year 1818. There were some other bodies acting for similar purposes, under statutes which had once had equal application to England and Ireland, but had continued in action here after they were repealed in England. Five years after the meeting of the Congress, in 1866, the vestries were finally abolished, and the guardians of the poor were entrusted with sanitary powers identical with those existing in England and Wales. The change was great and wholesome, and was pushed to better issues when the Local Government Board was created in 1872. It was armed with large authority, and acted with energy and success. An Act of 1874 developed the sanitary system and brought it into full operation throughout the country. Under that Act, the whole of Ireland was divided into sanitary districts, called urban sanitary districts and rural sanitary districts. The urban districts consist of towns having a population exceeding 6,000. The governing body of the town is made the sanitary authority. The rural districts consist of the poor-law unions, and the boards of guardians are the sanitary authorities. There are fifty-six urban sanitary districts, and 163 rural sanitary districts; and in each of those districts a complete sanitary staff has been organised under the orders of the Local Government Board. The medical officer of the dispensary district is, in all cases, the sanitary officer or medical officer of health. The principal duty of the sanitary authorities and their officers consists in the inspection of their districts, and in taking all necessary steps to compel the removal or abatement of nuisances, provide a proper supply of water, and construct, or cause to be constructed, where it may be necessary, proper sewers and drains. The Public Health Act of 1878 repealed all previous Sanitary Acts, re-enacting, amending, and consolidating their provisions, so as to comprise in one statute the entire sanitary law as it at present exists in Ireland. The principal subjects dealt with in the Act are:—

Sewerage and Drainage.
Scavenging and Cleansing.
Water Supply.
Abatement and Removal of Nuisances.
Lodging-houses.
Markets and Slaughter-houses.
Infectious Diseases.

So that the scope of the statute is comprehensive, as the machinery for effectuating its beneficial purposes is complete. I rejoice to say that its worth has been widely recognised. The increasing activity of the local authorities is demonstrated in the most conclusive way, by the amount of their expenditure for the last six years, as it appears in the audited accounts of the Board. I shall give you the figures, and you will judge how satisfactory they are.

Year.	Expenditure by Rural Sanitary Authority.	Expenditure by Urban Sanitary Authority.	Total.
	£	£	£
1875	32,934	25 933	58,867
1876	39,676	28,567	68,243
1877	44,870	29,185	74,055
1878	48,157	37,601	85,758
1879	50,767	31,312	81,079
1880	51,027	Not yet known.	—

But even more striking than this evidence of effort and progress is that which is afforded by the amount of the loans obtained from the Board of Works in those successive years, on the recommendation of the Local Government Board, "for objects, in the words of the Public Health Act, "which may be deemed sanitary improvements":—

1876-6	£37,584	1878-9	£124,454
1876-7	41,085	1879-80	285,179
1877-8	62,058	1880-81	199,252

It is not easy to over-estimate the importance to Ireland of the sanitary work which is thus proved to have been done. It has been of double advantage, by relieving the poor at seasons of sore distress, and securing the permanent improvement of the health of the community. Again, I think I may confidently say that in a department so deeply affecting the comfort and the happiness of a people, Ireland need not be ashamed of the progress she is making, and has made. And for her that progress is especially important. Health and social morals run closely together. Cleanliness and godliness are in alliance; and wholesome and commodious dwellings are important instruments of civilisation. The squalidness of his home drives the artisan for light and solace to the public-house. The mud-cabin, with its single room and crowded foulness, is not very compatible with the formation of ordered industry; and, save in a country still marvellously pure, its inmates would be subjected to many dangers. It is of great consequence, for reasons like these, which might be largely multiplied, that our sanitary work should extend not merely to lodging-houses, but, as far as may be, to the dwellings, generally, of the humbler classes; and that the English effort in that direction, which has been so happily prosecuted under the benevolent guidance of Lord Shaftesbury, should have wide and cordial imitation here.

I do not desire to take credit to your Association which it may not fairly claim; but you will permit me to mention, in illustration of the topic I have last considered, a not unpleasant reminiscence of 1861, of which record is made in the biography of one of our philanthropic citizens. In the autumn of that year, Mr. Senior and Mr. James Haughton resolved to give some practical application to wise suggestions which had been made as to the utility of ornamental gardening in public parks such as beautifies those of London, at the expense of the Imperial taxes. They prepared a memorial to the Executive. It was received with favour; and the People's Garden rose into existence,—at once a boon to multitudes who enjoy its beauty, and a worthy monument to the genial and accomplished Viceroy,—a true lover of the country he delighted to make his home,—whose graceful statue continues to adorn it.

And, touching thus on a local theme in connexion with public health, I may be permitted also to allude to the great undertaking by which, to the lasting honour of the man who conceived it and completed it, in spite of misconception and resistance, this city receives an abundant supply of pure water, secured by a vast but most profitable expenditure, which amounts, I am informed, up to the present time, to 530,000*l*. Nor should I forget to mention, in the same connexion, the gratitude which is due to a munificent nobleman who has lavishly employed his fortune in making one of the finest squares in Europe a place of joyous resort to his fellow-citizens. I can only make the briefest allusion to a measure most worthy of attention in the department to which I am referring,—the Irish Sunday Closing Act. It was hotly contested and violently denounced; but it has succeeded beyond expectation; and its moral influence in removing, even partially, the withering curse of national intemperance, has made it a practical reform of a high order. I cannot dwell on the mode of its operation; but the results are indicated in the most conclusive way by the unanswerable evidence of our criminal statistics. In 1878, when it was in action for a few months, the number of punishable cases of drunkenness was reduced by 3,000 as compared with the year 1877. In 1879, when it was in full force, the reduction was 11,000, and last year it was 22,000, the number of offences, which in 1877 was 110,000, having fallen to 88,048. It is not wonderful that success so signal, proved by these figures and in many other ways, should already have induced wise and good men to imitate the example of Ireland in other districts of the empire, with the sanction and by the authority of the Legislature. And does it not give us a fair ground for hope that the undoubted and most salutary improvement in the drinking-customs of the wealthier classes may be gradually extended to the multitudes beneath them; and that we may be emancipated, more and more, from the cruel dominion of a vice which is to us the perennial source of crime and misery, and degrades these kingdoms in the estimation of the world?

With reference to Art questions, the President said:—

Only a word as to our relation with the department you have lately added to your programme. The conditions of life in Ireland have not been, for many a century, consistent with the successful culture of the fine arts. They could not flourish in times, too much prolonged, of turmoil and misery and social chaos. We boast an ancient civilisation, which distinguished our island when darkness brooded on the world,—connecting the learning of famous seminaries, to which multitudes flocked from other nations,—*amandati in Hiberniam ad disciplinas*,—with excellence in art, still evidenced by the venerable ruins of our churches, and by remnants of rare workmanship in the precious metals and the sculptured crosses and rich illuminations of early Christian times, which have survived ages of strife and suffering, and are still to be inspected in our Irish Academy and in Trinity College. We are proud of their attestation to the old endowments of a country which in later days has vindicated its claim to artistic eminence by the great works of Barry and Maclise, and Hogan and Foley, and others who have gone; and of living men who inherit their genius and will emulate their fame. We have been placed at a serious disadvantage. The poverty of Ireland has not permitted a large patronage of art, and those who have been distinguished in any of its branches have found irresistible attraction and abundant reward in the English metropolis. But I am glad to be able to say that here, also, we have been making substantial advances. We have never, in later days, had such appliances and helps for the rising artist as we now possess. Our National Gallery, under wise and conscientious supervision, continually undergoing fresh development, need not shrink from comparison with similar institutions on the Continent. Its contents are very choice in their character and very comprehensive in the range of their subjects. A Science and Art Museum has been established, with every prospect of giving in a short time effective encouragement to art studies as applied to manufactures. Our Hibernian Academy was never so prosperous and so well endowed. Its visitors are increasing annually by many thousands, and, notwithstanding the hardness of the times, the purchasers of pictures become year by year more numerous and far more liberal in their expenditure. I allude to those things only that I may not omit all reference to our successful action in connexion with one of the most interesting of your departments; but I do not desire to intrude on the province of my noble friend who will preside in it, and more fittingly explain the nature and extent of the improvements to which I have lightly pointed.

In the Health Department on Tuesday,

Mr. Henry C. Burdett, F.S.S., read a paper on the desirability of hospitals being placed under State supervision, in which he adduced evidence in favour of this course being adopted. He said that a review of the discussions and circumstances relating to the management of hospitals and kindred institutions in the United Kingdom during the past five years, leads to the conclusion that hospital managers are becoming alive to the fact that the system heretofore in force cannot much longer continue unaltered and unreformed. During this period no less than four influential deputations have sought interviews with the Home Secretary, with the object in each case of obtaining a Royal Commission of investigation into the subject.

He placed first amongst the circumstances which have produced so active and unanimous a desire for inquiry the many anomalies of the present system of hospital administration. In the metropolis, especially, the hospital accommodation is imperfectly distributed, and in many districts is altogether inadequate. The administration of the hospitals as at present conducted is so uncertain and unsatisfactory that inquiry is needed to secure amelioration in the interests of the poor. To facilitate a right judgment, and to furnish reliable data, Mr. Burdett had prepared a variety of elaborate statistical tables. These showed that the cost of management in sixty-one general hospitals varies from 2½ per cent. at Cork, to 27½ per cent. at the Metropolitan Free Hospital; the cost per patient per week from 9s. 4d. at the Cork County Hospital to 3*l*. 0s. 4d. at the Leeds General Infirmary. A difference of 25 per cent. in the cost of management and nearly 700 per cent. in the cost of maintaining the patients, would alone warrant the appointment of a Commission. The special hospitals show equally startling discrepancies.

As to the distribution of hospital accommo-

dation, nearly nine-tenths of the bed accommodation in the London hospitals is situated within a radius of a mile and a half from Charing-cross. The population of London resident within the metropolitan area, and exclusive of the large number of persons who are annually sent to London for hospital treatment, cannot be less than four millions and a half, one-third of which number is annually relieved at the London hospitals. Out of a total of 4,579 beds for the whole metropolis, 3,486 are provided by the hospitals situated in the narrow area above specified. The unsatisfactory condition of the present out-patient system, and especially of that in force at the large metropolian hospitals, demands reform.

The appointment of a controlling authority, endowed with adequate powers to sanction, restrict, or prohibit the erection of a new or the extension of an already existing hospital or dispensary, was, he thought, urgently called for.

Nearly everywhere the building mania seems to have blinded hospital managers, so that extravagances, going far beyond the requirements of the districts in which the hospitals are situated, and entailing half-empty wards and increased cost of maintenance, are becoming the rule and not the exception. The indiscriminate institution of special hospitals and dispensaries is productive of evil, and a controlling power is urgently called for to prevent the multiplication of so-called charities, which oftentimes, springing from unworthy motives, decoy charitable funds from legitimate channels. Such examples of ill-advised expenditure reflect directly or indirectly great injury upon the poor, for whose benefit the large sums involved were originally intended.

The social and public aspects of this great question of the right government of our hospitals alone demand an immediate investigation. When something like one million and a quarter of the population of London annually seek and receive gratuitous medical relief, and when the whole wage-receiving class in the metropolis cannot be estimated at more than 1,400,000, there is enough to warrant an independent inquiry into the whole question by a Royal Commission. This feeling is rapidly spreading, and is making itself felt in the diminished incomes which the hospitals are now receiving from voluntary sources. This difficulty will certainly increase as the public become impressed with the knowledge that it is not the sick poor at all who are being benefited, but nearly the whole wage-receiving and industrial classes, a large proportion of whom are well-paid artisans.

ON THE REFINING AND HUMANISING INFLUENCES OF ART.

PERSEPOLITAN AND ROMAN PERIODS.

Under this title a paper was read in the Art Section at the Social Science Congress, on Wednesday, by Dr. Phené, F.S.A.

The author drew attention to the fact that, as in former papers, he had selected periods for comparison in which the national features treated of were either coeval or consecutive, and in which *contrasting* effects were most prominent, and as his object was to examine the influence of art in forming or swaying national character, the periods now selected exhibited *parallel* effects from similar causes, though at a greater interval, and with powerful intermediate nationalities, hence leading to more decisive conclusions. His last paper, on the Asiatic and Roman periods, might be supposed to have included the present one; but in that he had treated of Asian art during the time of the existence of high class art-schools, established after the period he was now considering. It might be thought that so little was known of Persian art, so little of Persian character, that there was but a slender foundation for evidence. That, he urged, was the evidence; the very little distinctive Persian art, and the flimsiness of Persian character, bearing a marked relationship. The Roman character was firm and vigorous, and the area of Roman arts extensive; but the parallel lay in the complete want of original art in both nations, and with the final similar result of annihilation. Indeed, the parallel was even more marked, for, in its earlier history, Persia assimilated to Rome in the primal temperance of its citizens and soldiers, simplicity of manners, dress, and customs,—through which both countries achieved their conquests and established their solidity, and at which periods in each art was unknown. Both also succumbed under a false appreciation of art, from its debasement to bodily and physical enjoyment, rather than the mental and philosophical refinements its culture produces, with their consequent far higher and more intense enjoyment. Although a momentary digression, he could give no better example than the following:—When it was sought to introduce the Asiatic mysteries into Greece, the Greek leaders long resisted them as degrading to the morality of the people. When it was sought to introduce the gladiatorial shows of Rome into Athens, a cry was raised by the populace, "First throw down the altar erected by our ancestors to Mercy" (Lucian).*

Here was true refinement from true appreciation of art; and it would be difficult to show that it proceeded from any other cause, as they were nations of a similar faith, and the Greeks even surpassing the others in military acquirements and courage, though numerically less powerful; while, of the three, they alone understood and cultivated art; they alone had artistic originality which taught them to reject alike sensual effeminacy from the East, and the cruel spectacular revels from the West. Greece and Greek fine art alone still live in fact; Rome and Persia but in history.

The effects upon existing nations have been widely different through the Asiatic and the Roman sway, notwithstanding their parallelism in deficiency of original art; for Rome had a period of utilitarian art, in which Persia was wanting. Both plagiarised to the fullest of their ability; both raised their palaces, and enriched their capitals, not only with the wealth, but the mental powers of the nations they conquered. The stupendous remains at Persepolis, combining the materials and dimensions used by Egyptian architects with the beautiful fluted columns and the capitals of quasi-Grecian art, attest this, though, with an Oriental supremacy and appropriation, the capitals were surmounted by an Indo-Assyrian ornament and shrouded with meaningless fretwork by Persepolitan artists, like the Eastern kerchief thrown over a captured beauty, to indicate that a place would be found for her in the harem. Even the gorgeous apparel of the Persians, and their costly tents and equipments, were borrowed from the Medes, the introduction of which by the great Cyrus was a folly of age inconsistent with his youthful chaste severity. When, satiated with conquest, and with the world at his feet, he resolved to fix his residence at subjugated Babylon,† he attired himself and his retinue, for the first time, in bejewelled and gold-embroidered Median robes, and with this was changed the retirement of the Persian women, who were thenceforward companions of the march and bivouac. The Persian is the effeminate feature of art.

The curious plan of Oriental enrichments on the sides of the great staircase leading to the celebrated hall of forty pillars at Persepolis, though having evidence of the Greek chisel, was also shown not to be original, but to have been borrowed from Chinese design.

Greatly different, the author pointed out, were the ruins of Rome, worked less in costly marble than useful brick, in which she stands pre-eminent. Her edifices tell, not alone of palaces, temples, and triumphs, but of aqueducts, factories, shops, and highways,—all borrowed from the Greeks of Europe or Asia, it is true; for Asiatic and Egyptian bricks, and (as we now know, from the recent discovery of that at Siloam) the aqueducts of the East, also existed before Rome was, but wonderfully adapted and beneficiently widely spread. At the very time that Rome was sinking from the influx of sensual luxury that came in with the spoils of Asia,—from her citizens not understanding the exquisite perfection and chaste purity of Greek art,—at that moment Western Europe was being enriched in utilitarian works by her paternal Government, soon to be polluted and withdrawn. But long as was the lapse and recoil into inactivity and darkness, those nations have recovered what she has not, and what Italy is now only slowly beginning to feel, a renascency, not only of all imparted by that great civilising mother, but with a picturesque and delicious charm arising from what Rome had not, the peculiar originality of each. So that whether in the useful or higher and refined art; in music, painting, or literature, national originality, and national mind and genius, ennoble modern countries, while not despising the useful Roman foundation of art established in each. If the Italian fine-art school rose first, it should be remembered that Italy was the sole place of deposit for the sculptures and paintings brought as spoils from Greece, some of which paintings remained till the time of Pliny, and probably long after.

* Lucian in Vit. demonact., p. 1,014.

† Xenophon, Cyropœdia, 1-7, p. 196; 8, p. 213 to 220, and 206.

THE BRISTOL AND CLIFTON JUNIOR ARCHITECTS' SOCIETY.

The first half-yearly meeting was held at Rupert-chambers, Rupert-street. Mr. John C. Monorieff, vice-president, presided. Messrs. George E. Ford and Wm. E. Hill, hon. secs., presented reports, from which we take the following:—The society was first instituted on the 8th of February of the present year, and the following gentlemen composed the preliminary committee:—Messrs. Cridland, Fawn, Fudge, and McPherson, with Messrs. G. E. Ford and W. E. Hill as honorary secretaries. The first meeting of the committee was held at 31, Clare-street, by the kind permission of Mr. W. L. Bernard, and Mr. C. F. Hansom, F.R.I.B.A., was chosen president, and Messrs. W. L. Bernard and J. C. Moncrieff vice-presidents. The thanks of the members and committee are due to these gentlemen for so readily consenting to fill these offices. The secretaries deemed it advisable to obtain a list of patrons. The programme of the society contained in its list of patrons no fewer than fourteen noblemen and gentlemen. This list, however, we have now increased to 32, which comprises six peers of the realm and other noblemen, members of Parliament, &c. Lectures have been given during the session by Mr. Henry Masters, on "Sanitation"; by Mr. J. C. Moncrieff, on "Art"; and by Mr. W. E. Hill, on "Apprenticeship." We have pleasure in noting that the society has already assisted in promoting two good objects, viz.,—the new St. Saviour's Church and the Bristol Benevolent Institution, for at the bazaars in aid of these objects the society exhibited large collections of drawings. It is greatly to be desired that the connexion already formed between the Bristol Fine Arts Academy and our society should increase, and that our members should look on the Academy not only as a place to meet in, but as a place to acquire learning and knowledge; for the advantages to be derived from the study which the Academy affords are not to be underrated. We also trust that our society may in time become linked to the Academy, as was the old society, and that the privileges enjoyed by the old society may now be enjoyed, in some parts at least, by our society.

The chairman, in moving the adoption of the report, congratulated the members on its successful bearing, and trusted that the number of members—at present fifty-two—would by the next report be at least doubled. He enumerated the advantages to be gained by the society being connected more closely with the Academy of Arts, and trusted that the members of the society would avail themselves of the opportunities of study afforded by that institution and the University College.

It was decided, with a view of further increasing the advantages of the society, and to further promote the study of architecture in Bristol, that a prize competition should be at once started, to be open to the architectural students and others connected with art in Bristol, all competitors to be non-members of the society.

A vote of thanks to the chairman, proposed by Mr. W. E. Hill, seconded by Mr. Geo. E. Ford, and unanimously carried, terminated the proceedings.

LINCOLN'S INN CHAPEL.

Some of our readers will doubtless be glad to know what is really about to be done here.

The chapel is to be lengthened one bay, and the present west window is to be taken out and re-erected in the new west wall; the stained glass in it is also to be preserved and replaced in the window. The two new side windows are to be exact copies of the present ones, the roof also. The west gallery and organ have been taken down, and are to be re-erected against the new west wall. The new seats are to be similar to the old ones. The crypt below will have also a bay added to it corresponding to the present ones, and similarly groined, and there will be a new west staircase. Every care, we are assured, is taken to preserve all interesting points. Mr. S. Salter is the architect engaged on the work

THE FISH MARKET QUESTION.

The inadequacy of Billingsgate Market and its approaches to the business of the fish trade of London and its surrounding districts seems to be generally admitted, and various suggestions have been and are being made on the subject. Among the numerous proposals that have been made is that the new Central Fruit and Vegetable Market in Farringdon-road, now approaching completion, should be experimentally used as a fish-market, its situation being convenient for the reception of railway-borne fish, as the basement is laid with rails in direct communication with the Great Northern, London, Chatham, and Dover, South Eastern, and other railways, so that the truck-loads of fish could be brought direct to the market. In the event of the experiment succeeding, it is suggested that the new market should be permanently devoted to the fish trade, as a supplement to Billingsgate, which latter market would then be chiefly devoted to the sale of water-borne fish. The needs of the fruit, flower, and vegetable trades in the City could, it is urged by those who make this suggestion, be suitably met by the erection of a new market on the site of the existing Farringdon Market.

Another suggestion, which appears to be worth consideration, although the site proposed is not in the City, is to establish a large fish-market at Bankside, Southwark, — between Southwark and Blackfriars Bridges. This site would seem to be capable of combining, to a very great extent, facilities for the reception and disposal of both water-borne and railway-borne fish, and the position is certainly not less central than Billingsgate. This proposal has been brought before the St. Saviour's District Board of Works by Mr. J. Leeuw, who says:—"We have at Bankside, Southwark, an area of about 365,000 superficial feet, which can, and at proportionate small expense, be extended. The area I propose is from Emerson-street corner, Bankside, to the corner of Love-lane, which is about 270 yards; thence through Love-lane to the corner of Sumner-street, 175 yards; thence to the corner of Emerson-street, down Little Park-street, 300 yards; and thence to Bankside, 120 yards. This area has a splendid foreshore and quay, and could be had at a proportionate small expense compared with the cost which for other places on the City side would have to be paid. On the back of Great Guildford-street, now called Sumner-street, is a large area, consisting of small tenements, which are now occupied by poor people in a more or less unenviable state, and which could be purchased very cheap. Converting this into a fish-market would even be a great improvement to London, the place being exactly opposite St. Paul's Cathedral. The area I propose is next door to the Chatham and Dover Railway, Blackfriars-road, which is not only in communication with the south coast, but also with the Great Northern and Great Eastern Railways, and nearly all the railways from the north and east, by which, according to admitted statistics, the greatest quantity of fish is sent up to London." The site above indicated could, Mr. Leeuw urges, be extended eastward as far as the west side of Southwark Bridge-road, at comparatively small expense, by the removal of three blocks of buildings bounded on the south by Sumner-street, on the north by the river, and on the west by Emerson-street and Park-street. Unless the proposed market area were thus extended eastward from the first, it does not appear to us that the street approaches would be adequate; and even then it would, it seems to us, be necessary to widen Great Guildford-street and one or two other streets leading from the suggested site to Southwark-street.

Queenhithe is suggested by Mr. Frederick Todd as a site possessing the following, among other advantages:—(1) That it affords an area four times that of Billingsgate Market. (2) A position more central, standing isolated, and having approaches on all sides. (3) Approaches commensurate with the increased size of the market. (4) Proximity alike to the river and to the district and extension railways; by which latter would be afforded constant and rapid means of communication to all districts lying north of the river. Mr. Todd urges that by the selection of the Queenhithe site, there could be erected two spacious markets, an upper and a lower one, both well lighted and ventilated, each about 535 ft. in length by 193 ft. in width, (the upper market, on a level with Queen Victoria-street, for general and retail business, the lower market, on a level with Upper Thames-street, for wholesale business), and giving extensive ranges of stall for the exhibition and sale of fish, amounting collectively to nearly a mile in length. He estimates the cost of the suggested market, including the land and all interests, at 840,600*l*. We are not so certain as Mr. Todd seems to be that the realisation of this scheme would not transfer to Upper Thames-street the condition of things which, as regards congested street traffic, now prevails in Lower Thames-street. Nevertheless the proposal, of which we have only given some of the details, is worthy of the consideration which it will doubtless receive in the City.

The site of St. Katharine's Docks and that of the Custom House have also been mentioned as desirable situations for a new fish-market. Of the former site, which would be exceedingly costly, it must be said that if chosen as the *locale* of a central market for the whole metropolis it is likely to prove too far out of the centre of London for the convenience of the trade (and this objection applies with increased force to suggested sites in St. George's-in-the-East and Shadwell, however well adapted they may be for local markets); while of the site of the Custom House, even supposing that the Government would or could dispose of it, the question of improved approaches and standing-room for railway vans, fishmongers' carts, and costermongers' barrows would still have to be considered.

As to the Blackfriars site, which seems to have found favour with a section of the Corporation, we cannot see that it would be suitable. The site proposed is on the north side of the Thames, a little to the eastward of Blackfriars Bridge. Have the proposers of this site forgotten that the London, Chatham, and Dover Railway obtained powers, in the last session of Parliament, to erect a new City terminus at this very point? Room for the terminus or for the market there may be, but there certainly would not be room for both (assuming that the proposers of this site do not intend to interfere with the large and costly block of buildings known as the City Flour Mills), unless it is in contemplation to utilise the space beneath the terminus as a market.

We see that at the meeting of the Metropolitan Board of Works, on the 30th ult., a letter was received from Mr. P. E. Masey, suggesting that the site of Millbank Prison should be appropriated to market purposes. This suggestion, and others on the same subject, were referred to the Works Committee for consideration.

ROSEWOOD.

Rosewood was once, even if it be not now, a fashionable wood. It was used for costly furniture and pianofortes. There is no information respecting its first employment; but it appears certain that it became known soon after the discovery of South America. Old writers speak of rosewood cabinets and other furniture made of it. The wood is met with only in South America. The French give it the name of "palisandre"; by the Germans it is sometimes called "Palissanderholz." What they term "bois de rose" or "Rosenholz" is, in reality, an African wood, and red with yellow streaks. It seldom attains a diameter of more than 8 in., and is cut into veneers to be used as a bordering in inlaid work or for floors. But the best quality of rose or palisandre wood is found in Brazil. All the finest descriptions of this wood are exported from Rio de Janeiro. Larger quantities of inferior kinds are sent out from Bahia. The latter sort, however, is only worked for cheaper articles, the fibre having a dark red colour and but few beautiful veins. Honduras also exports a description of heavy dark-coloured rosewood, which is mostly made into drumsticks and walking-sticks. The Rio de Janeiro wood grows to a good size, and has beautiful veins. The best is chosen for veneers; but the ordinary blocks with straight fibre look very rough and knotty. Rosewood is at present sold by weight; formerly it was disposed of by trunks. It contains a very stringent oil, which must be extracted by steam or else by long exposure to the air, before the wood can be glued. It has also a powerful smell, and people who work it seem to be penetrated with it. Nothing can remove it, and the worker in it may be easily distinguished from such as work in other woods; the dust rising from the wood when it is being rubbed with sand-paper is not poisonous, but it imparts to the face of the workman a peculiar, ghastly, expression. Rosewood is, if properly worked, the most durable description of wood, and may even after a hundred years' use be polished again so well that it looks like new. It is extremely hard and strong, and becomes harder with age.

AN ELASTIC LACQUER.

A patent has been taken out in Germany for a new description of elastic and flexible lacquer, which will not peel off, and which is suitable for the coating of carriage-cloths, plans, and other articles to be folded up, as well as for wood and iron work, walls, &c., but which may also be employed as an isolating layer for damp rooms, as a means against dry-rot, and in rendering stuffs waterproof. To produce the lacquer, 50 kilogrammes of linseed oil varnish are heated up to boiling-point. In another vessel about 15 kilogrammes of lime are slaked in 20 kilogrammes of water. As soon as the lime boils, about 50 kilogrammes of hot melted raw caoutchouc are added to the lime water, and the whole is stirred until it has become thoroughly mixed. This composition is poured into the boiling varnish, the whole being stirred all the time. Further stirring takes place until a homogeneous mass is formed, which is afterwards strained or filtered, and left to cool. After cooling, the lacquer has a pap-like consistency. To apply the lacquer, it is diluted with the desired quantity of varnish, and put on with brushes either in a warm or cold state. But it is said to be better to apply it warm, as then no varnish is required for diluting it. In rendering linen waterproof, the lacquer may be put on by means of brushes or rollers. After treatment, the linen or other stuffs, paper, &c., are hung up to dry. Stuffs are perfectly dry and ready for use in two days. The product is stated to be lustrous, elastic, not sticky, and perfectly waterproof.

NEW BANK BUILDINGS AT BRIXTON.

On a recently-cleared site at the corner of Brixton-road and Canterbury-road, a block of new buildings is at present in course of erection for the London and County Banking Company. The building has a frontage to Brixton-road, 24 ft. in length, with a return frontage of 55 ft. long, to Canterbury-road, the two elevations being 40 ft. in height, and uniform in architectural design and execution. The ground-floor portion of the two frontages, up to the first-floor windows, is in Portland stone, the elevation being faced with pilasters surmounted by carved capitals. The windows are arched and recessed. The upper portion of the building, consisting of two floors, is faced with red brick, with a free introduction of Portland stone for dressings and ornamentation. The entrance to the premises is in the Brixton-road frontage, which leads into the banking-room, an apartment 22 ft. by 28 ft. Immediately behind the banking-room is the manager's room, together with clerks' room and a waiting-room. A deep basement contains the strong room, the walls of which are built in brick and iron, with cement, the room being fireproof. The two upper floors form the manager's residence, the first floor containing a spacious drawing-room overlooking the Brixton-road, with dining-room, library, and other apartments in the rear. The second floor contains several bedrooms. There is a separate entrance to the manager's residence at the rear of the Canterbury-road frontage.

The architect of the building, as well as of some shops adjoining it, is Mr. C. Val. Hunter, of Wardrobe Chambers, Doctors'-commons. The builders of the bank are Messrs. Hill & Higgs. Mr. Greenwood is foreman of the works. The adjoining shops are being erected by Mr. J. Taylor.

Royal Exchange Roof.—We have seen the drawing now on view in the Merchants' Area, and quite agree with our contemparary, the *Builder*, on the subject of its most unsuitable and objectionable character. We think that it is only necessary, as it is certainly only just, that Mr. Sang's drawing, which obtained the prize among so many others when public competition was invited, should be exbibited, to disperse all doubts as to which or what design should be carried out.—*City Press.*

ECCLESIASTICAL ART EXHIBITION AT NEWCASTLE.

On Monday evening the Ecclesiastical Art Exhibition in connexion with the Church Congress was opened at the Northumberland Rooms, Pilgrim-street, Newcastle. Close to the entrance-door Messrs. Jones & Willis display a large collection of church furniture and articles of decoration. Messrs. J. Wippell & Co., of Exeter, show brass altar vases and church-fittings such as gaseliers, lamp and gas standards, &c. In the gallery at the west of the building an entire section is set apart for the exhibits of Mr. G. J. Baguley, artist in stained glass, Carliol-street, Newcastle. In one of the side rooms of the gallery which encircles the hall are the exhibits of Messrs. Cox, Sons, Buckley, & Co., London. Adjoining is the stand of Messrs. G. M. Hammer & Son, who exhibit school and church furniture. Messrs. Doulton & Co., of Lambeth, are exhibitors of several terra-cotta reliefs intended for reredoses, &c, illustrating incidents in Scripture history, and modelled by Mr. George Tinworth. Messrs. Lavers, Barraud, & Westlake, of London, exhibit a two-light window, containing figures of SS. Ambrose, Athanasius, George, and Katherine, together with three designs for decoration.

The Loan Collection contains some interesting items, including a collection lent by Mr. Wm. Bragge, F.S.A., of Birmingham, of 124 Russo-Greek "Icons," or religious pictures, chiefly in brass, many enamelled; some painted and mounted in silver, and silver gilt; twenty-four are crucifixes, sixty-four are single plaques; the remainder are diptychs, triptychs, &c. The smaller icons are in very general use amongst the Russian peasantry, and also amongst the wealthier classes, those worn by the latter being, however, of a much more costly character—some are even of gold. When a peasant is about to send his son to service in the army, he often takes from his neck the icon that he and his forefathers have worn, and places it with his benediction on the young soldier's breast. To the soldier himself the icon becomes a memento of his country, of his family, and of his religion, —of his country because it usually bears the effigy of some Russian saint, very frequently the patron, St. Nicholas; of his family, for this icon may have been an heirloom; of his religion, for when about to offer his prayers he opens his triptych or diptych and kneels before it as a portable altar. He carries it, suspended to his neck, through the vicissitudes of a campaign; and when, his labours ended, he returns to his native parish, he often lays his cherished possession upon the iconostasis of his village church, as a votive offering to commemorate his preservation. The subjects most frequently represented are events in the life of the Redeemer or the history of the Virgin Mary, Russian saints with their appropriate symbols, and copies of certain local pictures of the saints, some of which are highly venerated. They usually consist of the name of the saints, contracted in the most arbitrary manner, or of some short sentence descriptive of a portion of the picture, as "The Son of God," "The Angels of the Lord," and the like; though sometimes, as in the case of the crucifix and of the religious medals, the inscription is a text or a prayer. The costumes of some of the figures exhibit, in an interesting manner, the peculiarities of Greek ecclesiastical vestments.

Mr. Henry E. Franks exhibits an interesting collection of rubbings of monumental brasses. Mr. C. Hodgson Fowler, Mr. B. Edmund Ferrey, and Mr. James Hicks are among other contributors to the loan collection.

BIRMINGHAM.

Extensive Street and other Improvements.—On the 23rd ult., Mr. J. Thornhill Harrison, C.E., one of the inspectors of the Local Government Board, held an inquiry at the Council House, Birmingham, relative to the application of the Corporation to borrow 127,700*l.* for works of sewerage and street improvements, for providing public baths, and for market and fire-brigade purposes. The Town Clerk explained the various purposes for which the amount of loan was asked and the sums required for each item in the application. The first were for 11,025*l.* for the purchase of the site for the central fire-brigade station, and 10,000*l.* for the erection of the station. The amount of the builder's contract was 9,355*l.*, and the architect's commission, salary for clerk of works, &c., were estimated at 645*l.* They would also require for the construction of a market-house and other conveniences on the site of the present Smithfield Market, for the purposes of a vegetable market, 21,000*l.*; for the purchase of the leasehold interest in the Woolpack Hotel, for the widening of St. Martin's-lane and Jamaica-row, 7,400*l.*; for the erection of shops, buildings, and hotel in St. Martin's-lane and Jamaica-row, and other works in connexion with the market in consequence of the purchase of the Woolpack, 14,000*l.*; and for completing the purchase, from the governors of the Grammar School, of certain freehold land in Spiceal-street for the enlargement of the fish-market, 8,400*l.* Dealing next with the 22,000*l.* required for the erection of public baths in Monument-road, the Town Clerk explained that such provision in that quarter would meet a great want, and would complete the bath accommodation in the four districts into which the borough might be divided for that purpose, viz., north, south, east, and west; 30,000*l.* were also required for the Cole Valley sewer from Stratford-road to Tyburn, and the branch sewer from the same to the outfall sewer in Muntz-street; 1,000*l.* for effecting improvements in Snow-hill, Henrietta-street, Hampton-street, and Constitution-hill; 2,500*l.* for the purchase of the leasehold interest in Nos. 1 and 2, Moor-street, and 15 and 16, Bull-ring, for the purpose of widening and improving these streets; and 300*l.* for widening and improving Balsall Heath-road bridge and contributing one moiety of the cost. The amount of 75*l.* set down for legal expenses made up the amount of loans required to the total,—127,700*l.* Alderman Avery explained, with reference to the sewerage scheme, that the area of Birmingham was 8,400 acres, of which 956 acres were in the Deritend and Bordesley district, and naturally drained towards the Cole. Up to the present no proper system of sewerage or treatment had been adopted, because no resources had been within the reach of the authorities. In Deritend and Bordesley there were at present twenty-four miles of streets and twelve miles of sewers. The population was only 7,500, but was very much on the increase, and the time had arrived when the urgency of the question demanded attention. It had been considered much more convenient for one authority to undertake the whole of the work, charging a certain sum to each constituent authority, according to the extent which they used the sewer. It would be a very complete and effective scheme, and would provide ample accommodation for 100,000 persons, whereas 16,600 was at present the actual population of the area. The Borough Surveyor said the estimated cost, according to the route planned, would be 28,272*l.*, exclusive of compensation, or 29,560*l.* by the alternative route, by which the expense of 700 yards of public highway would be saved.

The New Central Fire Brigade Station.—On the 30th ult. the memorial-stone of this building, now in course of erection for the municipality, was laid by Alderman Deykin. The site is in the Upper Priory, upon the line of Corporation-street, and appears to be one of the most suitable that could have been selected. Over 20,000*l.* will be expended in providing the premises, 11,025*l.* being given, as above mentioned, for the purchase of the site, and 10,000*l.* for the erection of the buildings. The arrangements are intended to be the most complete in the kingdom. There will be accommodation in the engine-house,—the internal measurement of which is 95 ft. by 17 ft.,—for six engines, and the stabling will have room for a similar number of horses. There will be workshops and residences for the superintendent, the assistant superintendent, and the firemen, with their families, while a drill-ground, 150 ft. in length and with an average width of 40 ft., is included in the plans. There will also be a large washhouse, with a cover for washing the hose, with a lofty chamber for subsequently drying it. Over the engine-house will be a spacious store-room, a loft, and a reserve room for the firemen when not on active duty. Two bath-rooms will be so placed as to be available for the use of families as well as of the firemen, without their encroaching upon the working departments. The contract for the erection of the fire-station has been secured by Mr. W. T. Bennett, and the work is being proceeded with with all possible expedition. Messrs. Martin & Chamberlain are the architects, and Mr. Clapp is the clerk of the works.

The New Free Library.—The nineteenth annual report of the Birmingham Free Library Committee has just been issued. In it the committee say that the reconstruction of the library buildings in Ratcliff-place is now making satisfactory progress, although in the early part of the year difficulties occurred which caused much delay. The architects are of opinion that both the Lending and Reference Libraries will be ready, if not by the end of the present year, certainly early in the year 1882. With reference to the art gallery, the report details the course of events leading to the commencement of the new art gallery, following on Mr. Tangye's munificent offer.

A RECLAMATION.

MR. BEER'S MAUSOLEUM.

Monsieur,—Une circonstance fortuite me fait connaître tardivement une erreur qu'il est de mon devoir de vous signaler. Cette erreur remonte au 18 *Mai*, 1878, mais, pour n'avoir pas été relevée plus tôt, elle n'en est pas moins réelle, et j'espère ainsi que vous m'accorderez de la rectifier.

J'ai en effet étudié, à la demande de mon ami, feu M. Jules Beer, les projets du monument exécuté au cimetière de Highgate; mes projets ayant été approuvés, je les ai completés par un modèle au $\frac{1}{4}^{\text{eme}}$ de l'exécution, permettant de connaître, dans toutes ses parties, l'appareil de la pierre de la construction, et à ce modèle j'ai joint, outre les dessins au $\frac{1}{8}^{\text{eme}}$, tous les détails, grandeur, tant des profils que des ornements. Vous comprendrez ainsi ma surprise, quand, feuilletant votre estimable journal, j'y ai trouvé, au volume xxxvi., No. 1,841, du 18 Mai, 1878, pages 512 et 513, une perspective du monument de la famille Beer, et une notice en attribuant la composition et les dessins à Mr. John O. Scott, architecte.

C'est là une erreur qu'il faut attribuer à ce que l'exécution de mon travail, s'est, il est vrai, faite sous la direction de Mr. Scott, auquel la publication de votre journal aura échappé et qui tiendra sûrement autant que moi à réparer une omission involontaire.

Je n'hésite donc pas à vous la signaler, persuadé, que vous voudrez donner satisfaction à une réclamation dont le bien fondé ne saurait vous échapper.

Je vous remercie d'avance et vous prie d'agréer, monsieur, les expressions de ma parfaite considération. W. Bouwens, v. d. B.

Paris, Sept. 6.

*** On mentioning this communication to Mr. J. O. Scott, that gentleman writes us:—

It is quite true that the first design for Mr. Beer's mausoleum was made by M. Bouwens, of Paris, and had I been at home when the view appeared in the *Builder* I should certainly have taken care to state the fact. I did not know that any view had been published. The circumstances were as follow:—Mr. Beer procured a complete design, with full-sized drawings and a model, from M. Bouwens. He inquired of me through a mutual friend whether I should have any objection to superintend the erection of the mausoleum, and after some discussion it was agreed that I should do so, but should be at full liberty to make any alterations in the design which I thought desirable. I then set to work and remodelled the design, altering it very considerably both in its proportions and in its detail, and so it has been built. It is a joint work, as the leading ideas of the first design have been kept to, while it has been much altered in all other respects.

I shall be very glad if you will communicate this to M. Bouwens, with my best compliments, and I regret that such an oversight should have been made. If I remember rightly, M. Bouwens quite agreed to my dealing with the design as I might think best; but I am not clear about this, as it was only told me by Mr. Beer by word of mouth. J. Oldrid Scott.

SURVEYORSHIP ITEMS.

Lewisham.—At a meeting of the Board of Works for the Lewisham District, held on Wednesday, the 28th of September, Mr. E. van Putten was appointed assistant surveyor to the Board. There were between fifty and sixty applicants for the position. Mr. van Putten was articled for three years to Mr. C. W. Whitaker, of Great George-street, Westminster. Since then he has been engaged in the superintendence of various public works.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT

3,993. W. Wyman, Gloucester. Heating water for baths, &c. Sept. 16, 1881.

4,001. J. Shanks, Barrhead. Baths, sinks, &c. Sept. 16, 1881.

4,010. J. Imray, Southampton-buildings. Cooking-stove. (Com. by La Société des Spécialités Mécaniques réunies, Paris.) Sept. 17, 1881.

4,020. G. West, New Lenton. Smoke-consuming apparatus. Sept. 19, 1881.

4,033. W. Wright, Plymouth. Flush-cisterns for water-closets, &c. Sept. 19, 1881.

4,042. S. Clark, Islington. Gas and oil stoves for heating and lighting. Sept. 19, 1881.

4,050. A. Martin, Woolwich. Springs for doors, &c. Sept. 20, 1881.

4,054. E. De Pass, Fleet-street. Concrete materials for blocks for paving and building. (Com. by W. Hunt, New York, U.S.A.) Sept. 20, 1881.

4,065. W. White, Abergavenny. Building damp-proof walls, &c. Sept. 21, 1881.

4,077. C. H. Pennell, New Quay. Holding and controlling blind and other cords. Sept. 21, 1881.

4,083. W. Richards, Norwood. Apparatus for measuring water. Sept. 22, 1881.

4,085. C. H. Murray, Southwark. Apparatus for shaping and moulding clay for bricks, tiles, &c. Sept. 22, 1881.

4,090. W. Saunders, Stepney. Cleansing floors, &c. Sept. 22, 1881.

NOTICES TO PROCEED

have been given by the following applicants on the dates named.

September 20, 1881.

2,131. F. H. F. Engel, Hamburg. Petroleum or hydro-carbon cooking and heating stoves. (Com. by H. Kock, Hamburg.) May 16, 1881.

2,132. J. Hurst, Brighton. Portable crane for builders, &c. May 16, 1881.

2,149. T. F. Shillington, Belfast. Fireplaces or stoves. May 17, 1881.

2,160. E. S. Harvey, Tottenham, and J. Brodie, Bloomsbury. Attaching knobs to door, lock, and other spindles. May 18, 1881.

2,171. R. Stone, King William-street. Burning lime, cement, bricks, &c. May 18, 1881.

2,174. J. Walker, Leeds. Manufacture of bricks, tiles, &c. May 18, 1881.

3,318. W. H. Poole, Briston. Furnaces. July 30, 1881.

September 23, 1881.

2,222. A. McMillan, Thornliebank. Mode of applying springs to doors. May 21, 1881.

2,229. S. H. Ogden, Manchester. Firegrate screens. May 21, 1881.

2,254. H. Wedekind, Fenchurch-street. Brick-pressing machines. (Com. by O. Hoffmann and H. Dneberg, Berlin.) May 24, 1881.

2,759. S. L. Coales, Newport Pagnell. Door latches. June 24, 1881.

3,037. J. Gooddy, Wombwell. Securing the joints of earthenware and other piping. July 11, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending Sept. 24, 1881.

4,604. G. E. Waring, jun., Newport, U.S.A. Sewers, &c.

The main sewer-pipe gradually diminishes in size, and is provided with branches, on the ends of which automatic flush-tanks are situated, and it has connecting sewers with the houses which form open flues to the tops of the houses. Subsoil drains are laid in the same trench as the sewer-pipes to carry off the storm-water. The pipes are supported by broad piles driven into the ground. The joints are made by wrapping strips of paper round the ends of the pipes. Nov. 9, 1880. Price 10d.

440. T. Jackson, Edinburgh. Apparatus for supplying, heating, and circulating water for domestic purposes.

A high-pressure boiler is placed in the kitchen range, which is connected with the supply-cistern at the top of the house, and in which the water is heated and carried to the service-cisterns on each floor. To prevent accidents to the boiler, when the supply-cistern is empty another series of pipes is led from each of the service-cisterns back to the boiler, which can be opened in case of need. Feb. 2, 1881. Price 6d.

448. E. A. Rippingille and J. D. Rippingille, Aston-juxta-Birmingham. Lamps and lamp-stoves.

The height of the oil in the tank is indicated by a prism of glass mounted in the top of the tank. When one chimney only is employed in an oven, as described in the specification of Patent No. 680 of 1880, a channel is formed on one side, which is in communication with the top of the chimney, thereby heating the lower part of the oven. The stoves may be constructed with more burners and chimneys intermediate of the side-burners, and forming an oven on each side. Feb. 2, 1881. Price 6d.

498. E. Edmunds, Fleet-street. Kilns.

The kiln is a gallery or bricked chamber, under which atmospheric air is allowed to circulate. The gallery contains a certain number of trucks, with bottoms and sides of refractory material in which the cement or bricks, &c., are placed. The bottoms of the bricks form the sole. In the middle of the length of the gallery are placed underneath four recuperators of heat in pairs, two for air and two for gas. Twelve flues are placed above them, terminating in mouths on a level with the sole. The hot air and gases leaving these mouths ignite, burn the materials in the trucks, and are then sucked in to the mouths of the other set of recuperators, and thence pass to the draught chimney. A gazogene on the Siemens system is placed at the side and the back of the kiln. (Com. by C. Amand, Tournay, Belgium.) Feb. 5, 1881. Price 8d.

600. J. D. Sprague, Norwood. Cords for suspending pictures, &c.

The strands of wire or hemp, flax, &c., are twisted to form a line or cord, but have loops or eyes at regular intervals to receive the hook of the picture, &c. Feb. 11, 1881. Price 4d.

610. P. Stuart, Edinburgh. Manufacture of Paving, Floors, &c.

A layer of small stone is first laid. On this is placed a layer of concrete, composed of pulverised oxide of iron and crushed stone, &c., mixed with cement and water. For outside paving, grooves are made in the concrete, in which iron rods are laid at right angles to each other. On this surface a composition of granite, with pulverised oxide of iron, hæmatite iron ore, and cement is spread and levelled. This composite pavement is laid in alternate squares, the layer of concrete in each alternate square projecting beyond the upper layer of granolithic composition. Feb. 12, 1881. Price 6d.

705. F. W. Fletcher, Westminster. Metal substitute for putty.

A strip of thin, hard metal, curved in its width, is fixed to the glazing bar in such a position that one edge of its convex surface shall press against the surface of the glass. (*Pro. Pro.*) Feb. 18, 1881. Price 2d.

706. J. H. Jack, Edinburgh. Close and open cooking ranges.

This relates to the construction of a flue-doorway in the vertical back or cove-plate, leading right into the central back-flue over the hot plate. The upper outer edge of this flue has a flat door. (*Pro. Pro.*) Feb. 18, 1881. Price 2d.

707. R. Brierley, Preston. Securing window-blinds to rollers.

A groove is formed lengthwise in the roller to receive the end of the window blind, which is secured therein by a strip of wood or metal. (*Pro. Pro.*) Feb. 18, 1881. Price 2d.

727. S. H. Adams, Leeds. Apparatus for flushing and ventilating drains, &c.

A syphon has an internal smaller syphon, the discharge through which withdraws the air from the larger syphon, and brings it quickly into action. A small hole is made in the inlet leg of the large syphon above the point at which the liquid is drawn off, so that when the water in the tank falls below this hole, air is admitted and the syphon is put out of action. For ventilating drains, the gas from the drain is made to pass through a chamber, through which also a current of fresh air is continually passing, which dilutes the gas and renders it less injurious. Feb. 19, 1881. Price 6d.

1,476. R. H. Brandon, Paris. Producing designs and ornamentation upon artificial ivory.

The designs, &c., are produced by compression in heated dies or moulds, in connexion with which an ink or sizing is used which carries a colour. The pressure is applied long enough to cause an absorption of the ink or colour, and the heat is applied afterwards. (Com. by J. S. Hyatt, U.S.A.) April 6, 1881. Price 2d.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

COMPETITIONS.

Fulham Infirmary.—At the meeting of the Board last week, a letter was read from the President of the Institute of Architects, naming three architects for the Board to select one to advise them on the merits of the twenty-six sets of plans for the proposed new infirmary which had been received. The fee to be paid was 100 guineas. The architects named were Mr. H. Currey, Mr. P. C. Hardwick, and Mr. E. l'Anson. Ultimately Mr. Currey was selected.

Museum, Dublin.—Sir, I sent a note a few days ago asking for an extension of time in connexion with this competition, and in reply the secretary wrote, "It is not considered necessary to extend the time, as the number of applications for the conditions for the competition has been very large, and there have been but two applications for the extension of time."

I have now to suggest that those among the intending competitors who find the time too short should at once write asking an extension of at least a month. It is quite evident that no architect whose time is otherwise much occupied can do anything like justice to this competition within the time allowed at present.

AN ARCHITECT.

Cleopatra's Needle. — The second bronze cast of the sphinxes, executed by Messrs. Young & Co., is ready for erection, and only awaits the necessary preparations for its removal to the base of the needle.

ON THE USE OF THE WORD "NATURE" IN REFERENCE TO ART.

SIR,—Your own desire, as that of your correspondents, is, doubtless, to elicit truth for the advantage of the future. I need not, therefore, apologise for addressing you again on the subject of the use of the word *nature* in reference to art. "In the multitude of councillors there is wisdom"; albeit, in the discussion in council there may appear to be some confusion.

In all that I write upon art I have a mathematical calculus ever present to my view and to guide me, though I may avoid mathematical expressions in my discourse. Now, the very fact that there is wisdom in the multitude of councillors bears upon an affirmation of mine to which you take exception, for it depends upon the law of probability that, in the aggregate, men will err as often on the one side as on the other of the mean of truth, and so, from the average of opinion, common sense is attained. The neutralisation of opposite views ultimately causes men to tread in the middle course. This law of probability obtains in forming a just estimate of nature's intent in all kinds of natural phenomena; by its means we may arrive at a just conception of the good and the beautiful. I, therefore, venture to repeat with confidence what I stated in my letter of the 3rd ult.,—that the general tendency of nature is to the middle course between opposite extremes. If this were not the general tendency of nature, then nature's general tendency would inevitably be either to the extreme of excess or to the extreme of defect. The logician will understand that this position is incontrovertible. Some persons, indeed, might possibly argue that there is no general tendency or direction in nature; that nature is a mere chaos of manifestations. This assumption would at once sweep away the idea of moral governance,—direction,—in nature. If this were true, it would, of course, be immaterial what course men should pursue either in conduct or in art.

But to affirm that the general tendency of nature is in a course between opposite extremes is to affirm that the general tendency of nature is towards the symmetrical or proportioned, *i.e.*, that its general tendency is a moral tendency, whereas if it were to either extreme of excess or of defect it would be immoral, just as we know it is in one section of nature, the human. In your leader of the 24th ult. you bear witness to the truth that nature recognises the force of the axiom *in medio tutissimus ibis*, in the following passage, "Anything like absolutely geometrical symmetry is, in fact, the exception in the forms of the vegetable kingdom, and in the animal kingdom even is only to be found in the main disposition not in the details. The hands are symmetrically disposed, but the hand itself is quite unsymmetrical." Just so, I should have said, if regularity had been substituted for "symmetry," and irregularity for "unsymmetrical," for the human form, which is regarded as the highest type of animate existence, is neither too regular nor too irregular; its highest beauty depends upon its being proportioned or balanced between extreme regularity and extreme irregularity.

It is a mistake to confound the symmetrical or proportioned with the geometrically regular; the regular geometrical figures are abstractions seldom or never realised, with mathematical exactness, in the concrete, and they are in all cases extreme forms. The symmetrical in its true sense means the proportioned, not the geometrically regular, and the proportioned in every species of phenomenon is that which lies between its extreme manifestations.

Notwithstanding it is a province of art to give to airy nothings a local habitation and a name, I would rather not for my own part, forcibly as you argue for it, admit the word "metaphysics" into the contention, partly because metaphysics appear to me to be wholly beside the question at issue, and partly because our friends the artists are "so absolute" that its use might frighten them from the discussion. The question is not now how we should denominate the various subdivisions of nature, but what meaning it would be most expedient to attach to the word "nature" to ensure greater unanimity in arguments upon the principles of taste. The prevailing notion amongst one section of artists and critics, which vitiates art discussion, is this,—that whatever is to be found in nature sanctions its use in art. If this were true, nature would sanction anything and everything in art; for nature, as defined by Professor

Huxley, is the all-including. He defines it thus: as "the sum of phenomena presented to experience; the totality of events, past, present, and to come." The word "nature" in this, its all-including sense, and as I would have every artist and critic accept it, brings us at once to our bearings in art discussion; for as anything and everything are to be found in nature, we are at once compelled to inquire whence the sanction for the acceptance of certain conditions, and the rejection of certain other conditions, in art? We reply that this is to be found either in their appositeness or in their inappositeness to correct judgment.

Art treatment, therefore, broadly divides into the imitation of the concrete,—realism; and the presentment of the abstract,—idealism. The first is the primitive, easier, and lower aim of art, because it is merely imitative; nature may be taken as it comes, it does not involve rational choice. The second is the later, more difficult, and higher aim, because it involves culture, considerable study, a knowledge of principles, and rational choice; nay, I believe I may even say, moral choice. Moreover, the definition of the word "nature" recommended for adoption shows us that the ideal is nature as well as the real. To the thinker it is the better nature of the two.

Mr. Colling thinks, in common with many other artists, that there is some position outside and apart from nature, from which it is a virtue to study nature. He and they cannot grasp the simple fact that there is no such position, and that there is nothing but nature to be studied, if we study at all; that the very worst and the very best productions of either human or external nature are nature, and equally the effects of natural laws, either special or general.

Mr. Colling is right, however, when he states that all ornament must have a geometrical basis. It cannot have any other. Whatever can be measured and delineated is geometrical. But if he means by this that all forms of growth exhibit a tendency to the regular geometrical figures in their arrangements, he is wrong. The most eccentric form is as geometrical as the most regular. Japanese ornament is as geometrical as the Greek, but it is not so symmetrical, and it is also possible for ornament to be more geometrically regular and yet less symmetrical than the Greek. The three terms of the scale of geometrical differentiation are the following:—

Extremely irregular configuration.	Symmetrical configuration.	Extremely regular configuration.

And the general principle which should sanction the leaning to either the one or to the other of these characteristics is that of adaptation to purpose, and the sanctity of the purpose is measured by the ratio of its goodness. But I fear I shall not yet be understood.

W. Cave Thomas.

VERGERS AND CATHEDRALS.

Sir,—The letters of "F.S.A." and "C. T. H." which have appeared in your journal are well timed; and as the subject has been so ably opened, it is to be sincerely hoped that you will use your powerful influence in mitigating a few of the hindrances which forbid (to the interested visitor) the full enjoyment of most of our cathedral churches.

"C. T. H.," as your readers have doubtless seen, refers to Salisbury. A visitor to the cathedral last week related to me almost word for word that delectable dissertation with which "C. T. H." entertained your readers in your journal of September 17th.

I visited the cathedral this week, and to my mute and joyful astonishment (without either tip or request) the verger volunteered to let me enjoy the mysteries of the choir in peace. I thought at the time that the correspondence in the *Builder* was bearing fruit.

The junior verger was equally obliging; for he in like manner, without demand from self, asked if I would care to remain in the chapter-house, an offer which was most gratefully accepted; so that, unlike "C. T. H." (to whom I am deeply indebted), I had an opportunity of feasting my eyes on a chapter-house second perhaps only to Westminster.

As regards York, my experiences last July were much the same as those of "F.S.A."

Having spent three weeks this summer at Lincoln I can add to "Mr. Harry Hems's" notice of the civility of the Exeter officials. I had ample opportunity of noticing the vergers of Lincoln Cathedral, Messrs. Logsdail and Barnett.

Mr. Logsdail has studied his subject well, and being always on the spot, has to a certain extent grasped the church as a whole. Whether to large or small parties, or to individuals, he seems most anxious to teach them as much as is possible while they are under his direction; of course, some appreciate this, others do not.

So that, at least in Lincoln, the visitor is not pestered by the up-and-down-hill shilling-seeking illiterate verger, so common, I am sorry to confess.

Yesterday I was in Wells, and the vergers here hand you a card upon which is printed a short description of the choir, &c., and the visitor is left to himself.

Let all deans and chapters of our cathedral churches follow the excellent example set them by their brethren of Wells.

If you, sir, through the powerful influence of your journal, could secure for students and others the privilege of making notes without leave, you will at least have the heartfelt and lifelong gratitude of one Student.

A WALK IN KENT.

Many are the places of historic and architectural interest that, not included in any regular tour, and unknown to excursion "there-and-back" travellers, remain in the almost untrodden freshness of their early beauty. The architect or the artist may plan numerous journeys which, in the compass of a few miles, are full of almost unknown beauty.

Such a journey was commenced one bright day not long since by a short ride to Edenbridge. The town has many old houses which, under modern lime-wash, show their massive timber construction, and some of the rooms are remarkably quaint with wrought oak beams and wooden ceilings. A narrow turning from the High-street to the church is suggestive of similar picturesque nooks in ancient towns and villages. Some Norman traces may be noticed in the church.

Through winding lanes, bordered by early primrose, Hever is soon reached. One of the smallest of the quiet villages of Kent, it seems as though three long eventful centuries have wrought but little change there. Two or three houses are newly built, otherwise, as the visitor ascends the hill where stands the village church and school, and inn, he sees the Hever where Sir Geoffrey Boleyn, mercer and Lord Mayor, retiring from city life, bought an estate; where his grandson, Sir Thomas, completed the castle thereon founded; and where gentle Anne walked and studied with her French "gouvernante" in the early, happy years of her short eventful life. The moated castle, the Boleyn chantry and tomb in the church, and the sign of "Henry VIII." on the village inn, recall the names of those whose presence gave fame to that country side.

A mile or more over the sand hills, through hop-gardens and flowery hedgerows and lanes, and the traveller arrives at Chiddingstone. That part of the village that adjoins the church is a rich specimen of timber construction, forming, with the church on one side, and the park at one end, a delightful picture. In the park, immediately behind the houses, are some prominent masses of rock, one of which, somewhat resembling a huge leaf, has been claimed to be the chiding stone where contentious parties met to have their differences decided. A solitary gateway, in the pseudo-Classic style, and bearing a sixteenth-century date, stands in the park near the rocks.

After walking rather more than a mile along the road, the traveller arrives at two lodges in the mock-fortress style; turning in a gateway adjoining the left-hand lodge, a beautiful avenue leads to the Classic "groves of Penshurst," nearing which the river crosses under the road and meanders among the meadows and pollards that skirt the village. Here the beauties of Kentish scenery are seen to advantage clustering round the ancient home of the Sydneys. Here the charms of nature, history, and archæology unite, and the traveller will be willingly mindful of Southey's words and

> "Tread
> As with a pilgrim's reverential thoughts
> The groves of Penshurst."

Under some quaint houses, where the beam of the lich-gate sets forth the bright words of inspiration,—"My flesh also shall rest in hope," is the principal entrance to the churchyard, a secluded resting-place shaded by the walls of Penshurst-place, and the church, partly rebuilt and modernised. Both should be seen. The former, the residence of Lord de L'Isle, has an almost unique example of fourteenth-century work in its hall, where the open timber roof, centre hearth, minstrel's gallery, and massive oak tables, and many other objects of interest, remain *in situ* to interest the visitor.

Another glimpse of the village, then along the park, where the famous oak still stands, two miles more through Kentish lanes, and then, as the shades of evening fall, to await the train at Penshurst Station. H.

"A VICTORY OVER SEWER GAS."

Sir,—I have read Sir Henry Cole's letter under the above heading, on pp. 419-20, and as it deals with what I have had considerable experience in for years back, I beg to say a few words upon the subject. Firstly, I would point out that the title seems to me to be a misnomer, as what Sir H. Cole and Mr. Mineard are really trying to fight is not "sewer" gas, but rather drain and soil-pipe gas; hence the word "sewage" would have been more correct. In my own practice with house-drainage, a "victory over sewer gas" is not worth while talking about, much less crowing over, as the sewer gas is easily shut off, practically speaking, by the insertion of one of my disconnecting ventilating-traps between the house and the sewer. The real fight, then, begins in protecting the inmates of the house from themselves, and it is really this fight which Sir H. Cole gives a description of on pp. 419-20, and on plates Nos. 1 and 2. Upon examining the plans, I find, as it seems to me, as a practical tradesman, that the writer is rather premature in claiming the "victory"; for his own account shows that there has really been no battle, but only a slight skirmish or two. So far as I can judge from the plans, when the real battle comes the upshot or result of the fight may be defeat and not victory, and that, too, notwithstanding the enormous forces employed.

The idea of using a heating force to bring the current of air *down* the soil-pipe and along the drain and then up a special shaft, is an old one. It will be found in the provisional specification of a patent by Mr. John Honeyman, F.R.I.B.A., dated 6th of February, 1868, No. 404, and so far as Mr. Mineard's "improvement," if any, is concerned, I hardly think the game worth the powder. We are told the expense for gas will be about 1s. per week, or 2*l.* 12s. a year; but, even with this expense, there is no real guarantee of safety, for it is well known that such an upcast shaft as is shown (it is only marked 3 in., too) will draw its supply of air from the openings nearest the heating-chamber, and so if the joints at, or stones over, the intercepting chamber, were not tight, no ventilation of the drain, even, might take place, far less of the soil-pipe as intended; then, as no traps are shown on the soil-pipe, what would protect the house? Further, to make this plan of Mr. Mineard's work, the gas must be kept burning day and night; while to make it work properly and against the action of the chimneys, I fear both Mr. Mineard's 3-in. pipe and his shilling's worth of gas a week are far too little.* Sir H. Cole's deductions from the experiments described by him are not warranted, I consider, and his recommendation of the plan so highly is far too premature, and, I may even add, dangerous. Too high laudation of newly-hatched plans has done a great deal of evil, and should be guarded against, and especially by scientific men of position; it is not every duckling that turns into a swan.

Permit me further to point out various other bad points in the plan of the drainage on No. 1 sheet.

1st. About 20 ft. of the drain from the servants' w.c. seems to be unventilated (if ventilated properly the ventilation downwards of the soil-pipe would be "waved").

2nd. Owing to the want of traps on the closets above, or if any leakage existed in the soil-pipe, then at the first chance foul air would come out, which, instead of only being from the soil-pipe alone, would in this case be from the drain also. This is anything but an improvement upon plans published years ago.

* Why not keep the drain out of the house altogether, and so save both risk and gas expense?—W. P. B.

3rd. Fitting up a bath without a water-trap on its waste-pipe is another mistake, and so with the lavatory basin.

4th. No trap on the sink in the scullery is another fault.

5th. Putting in an apparatus to blow off stinking air in a town house continuously, even when there was no wind to carry it off, is hardly a plan to be recommended at the present day, when plans for the prevention of the pollution of the atmosphere of our towns and cities are under consideration.

I might say more, but I should first like to see what Sir Henry Cole has to say in reply to the foregoing criticisms. W. P. Buchan.

THE LATE MR. E. C. SAYER.

A few particulars as to the career of the late Mr. Edwin C. Sayer may not be thought an undesirable record, inasmuch as he was an individual much known and esteemed by the architectural profession, to which he belonged.

He was a native of the West of England, where he resided until the completion of his term of articleship in Bristol. Coming to London in the early part of 1841, his first engagement appears to have been as an assistant among the already numerous staff in the office of Messrs. Scott & Moffatt, of Spring Gardens, — subsequently that of Mr. (Sir Gilbert) Scott alone. In the May of that year I myself entered the same office, in a similar capacity, as did also Mr. J. K. Colling in the following November; and thus commenced an acquaintanceship with the deceased which was maintained to the last. Upon quitting Messrs. Scott & Moffatt's, he migrated temporarily to Norwich, to the almost equally busy office of Mr. John Brown (familiarly known as "Brown of Norwich"), and then, returning to London, he became attached to that of Mr. Sydney Smirke, where he met with the late Mr. James Wylson, and thus, in conjunction with Mr. Wylson, Mr. Colling, and myself, he, towards the close of the year 1842, helped to found the "Association of Architectural Draughtsmen," "reconstructed" in 1847 as the "Architectural Association," now so flourishing and useful. Of this original association Mr. Sayer was the first secretary, and a letter from him on the subject appeared in the *Builder* of January 8th in the present year.

There was yet another distinguished London office with which he became connected, viz., that of the late Mr. Pennethorne, of Whitehall, whom he assisted in many important professional works. His concluding engagement of this nature was in a smaller sphere, but one that again appeared well to suit his predilection for Classic rather than Gothic art. As right-hand man to the late Mr. Humbert, of Fitzroy-square, the architect of the Royal Mausoleum at Frogmore, and also at Sandringham for the Prince of Wales, his abilities were largely exercised in the carrying out of both these works; and at Mr. Humbert's decease he had the satisfaction of finding that a handsome legacy from that gentleman was a farther proof of regard for his faithful service. Such instances are, unfortunately, too rare.

Being always a devoted admirer of Sir Christopher Wren's works, Mr. Sayer procured access to the model of the first design for St. Paul's Cathedral at a time when it was less known than it is at present; and in his leisure hours he prepared a series of large and careful drawings, to scale, of that proposed edifice. These he cherished for a long while in his own possession, but I think that a few years ago he presented them to the Institute of British Architects.

Owing to the peculiar bent of his disposition, and to his naturally reserved habits, he was never ambitious to set up in practice for himself, preferring to work with and for others, until some time ago he retired from professional life, to devote himself more to those literary pursuits which were ever his special delight. He was a great reader of standard books in various languages; also of the best productions of a lighter kind. Being, moreover, a good logician, and possessing a retentive memory, his conversation was invariably instructive and entertaining; always greatly appreciated by the limited circle of friends to whom he chiefly confined himself in his later years. But there is little doubt that this comparative isolation had a more injurious effect on his sensitive and nervous temperament than he was aware of; thus tending to hasten his death, which occurred on the 23rd ult., at the age of sixty-three, and in the house where he had lived for nearly twenty-five years. J. Drayton Wyatt.

CASE UNDER THE BUILDING ACT.

At Worship-street Police-court, on the 22nd ult., before Mr. Hannay, Mr. W. H. Middleton was summoned by Mr. Frederick Meeson, District Surveyor for East Hackney (North) for 15*l.* 1*s.* 4*d.*, for expenses incurred under the 47th section of the Metropolitan Building Act 1855, in rebuilding walls of less than the minimum thickness allowed, and in raising stories of less than the minimum height, of a block of five houses at the corner of Castlewood and Mountfield roads, Craven-park, Stamford-hill.

The works were carried on in December and January last, at which time the defendant was owner; but he became bankrupt in January, shortly after the completion of the works. An account of the expenses named was served on him in June last.

The magistrate considered the defendant was not liable, as he, being then a bankrupt, could not be said to be in receipt of the rents or profits when the account was served on him. Summons dismissed.

BUILDING BY-LAWS.

BUILDINGS FOR RAILWAY PURPOSES.

At Highgate, Alfred White, builder, of 152, Central-street, St. Luke's, appeared before Mr. Lermitte, Colonel Stedall, and Mr. Homan, to answer two adjourned summonses, taken out by order of the Finchley Local Board of Health, charging him, under that Board's by-laws, with failing to give written notice to the Board of his intention to erect certain buildings on land belonging to the Great Northern Railway Company, adjoining Torrington-park Station, Finchley, and failing to send in complete plans or sections of such buildings; also with erecting the buildings without enclosing them with properly constructed walls. Mr. Stevens, solicitor to the Board, prosecuted; Mr. Dodd, barrister, instructed by the solicitors to the Great Northern Railway Company, defended.

The buildings erected were an office built of wood, and a corrugated iron stable, both used by Messrs. Rickett, Smith, & Co., coal merchants, and, as they were within 30 ft. of adjoining villa premises, Mr. Stevens contended that they came within the provisions of the Board's by-law, and that, not being for the purposes of the railway company, exemption could not be claimed under the 157th section of the Public Health Act. Mr. Dodd contended that, both under the company's private Act and the Public Health Act, the buildings were exempt. They were erected for Messrs. Rickett, Smith, & Co. by the company, but might have to be extended to meet the requirements of other coal merchants, who otherwise might appeal to the Railway Commissioners, or they might have to be removed altogether, to extend the station. He further contended that the by-law must be considered legally "bad" in this case, as it was unreasonable to require wooden or corrugated iron structures to be put together with good mortar. No demise of the land had been made to Messrs. Rickett, Smith, & Co.

The Bench considered that the buildings were exempt, but formally postponed their decision to give Mr. Stevens an opportunity of appealing, if instructed to do so.

PROVINCIAL NEWS.

Weston-super-Mare.—The new Masonic Hall here has just been completed. It is situated at the corner of the Waterloo Boulevard and Longton Grove-road, and has been built from the designs of Messrs. Hans Price & Wooler, architects, of Bristol, in the Late Tudor style. It is built entirely of Bath stone, laid in irregular and narrow courses. At the corner nearest the boulevard is a tower rising to some altitude, and having a projecting embattled and panelled cornice, resting upon bold corbels. Above is a low, half-timbered roof, terminated by a flattish-pitched spire, whose roof is covered in by oak shingles, and surmounted by a gilded copper vane. In sunken quatrefoil panels along the upper part of the façade facing Longton Grove-road are shields bearing various Masonic emblems. The two entrances are moulded and carved, particularly the main one. Over this is a recessed and canopied niche, whereon stands a sculptured figure, in Kenton stone, of the patron saint, St. Kew. This statue is the work of Mr. Harry Hems, of Exeter, by whom also all the carving in stone and wood throughout the building has been done. The lodge-room has an opened timbered roof, ornamented by carved wooden bosses. The hall has been built by Mr. S. Taylor Harvey, of Bristol, within the time allowed by the contract conditions.

Whitfield Court (Herefordshire).—During the past two years and a half very extensive alterations and additions have been in progress at Whitfield Court, the seat of Mr. and Lady Katharine Clive. The work, which has now been completed, has been carried out from the plans and under the superintendence of Mr. Cheiake, architect and county surveyor. In the year 1853 the late Rev. Archer Clive found it requisite to increase the size of Whitfield by the erection of a new entrance-hall, with three bedrooms over, and offices below; and this block of buildings was termed the east wing. This wing has now been raised one story higher, so as to give three more rooms. But the most conspicuous change in the mansion consists of its enlargement by the addition of a new block on the south-west. The principal room in this new portion is a drawing-room, measuring 44 ft. long by 24 ft. 6 in. wide, with a height of 22 ft. in the clear, in addition to a large octagonal bay window. The space over this apartment is divided into three or four rooms. The walls of this block are 3 ft. thick, faced with stone from the estate, worked in their courses, and lined with brick inside, so as to guard against damp or uneven temperature. The approach from the library to the drawing-room is through a secret book door, and behind a triple arcade, opening immediately into the drawing-room. This arcade consists of three arches, resting upon twisted columns with caps and bases, the latter being supported by a carved plinth. Two of the arches have a moulded transome, separating them from the arcading below, whilst underneath the transome are some old Italian cut velvet hangings, to screen the library door from the drawing-room. There is also an entrance from the first landing of the principal staircase to the drawing-room through a richly-carved door, which Mr. Clive purchased in Florence. This door was sent to Whitfield, and designs made for having it encased in jambs to match, including a pierced tympanum. This portion of the work, as well as the book-shelves and the arcade from the library, was executed by Signor Borrani Piazza, Santa Maria Novella, Florence. It is worked in Italian walnut, polished, with the mouldings relieved by gold. The floor of the drawing-room is of the parquetry pattern, and was constructed in Venice and sent to England in pieces of about 2 ft. by 2 ft. All the rest of the woodwork is teak, with the exception of the massive chimney-piece, which is constructed in wainscot oak. A new staircase in wainscot oak is one of the principal features of the new work. A large reservoir, capable of containing 25,000 gallons of water, has been constructed on what is known as the Sheep Walk, and is intended to furnish a supply of water to the house, and will also enable the mansion to be flooded in case of fire. Hydrants are fixed at intervals round the house, and internally, at the most exposed parts on each floor, large service-pipes with taps and hose are placed. The whole of the water-supply arrangements have been carried out by Messrs. Easton & Anderson, of London, whilst Messrs. Rosser & Russell, of 22, Charing-cross, London, have furnished the structural arrangements for heating, and hot-water supply to housemaids' closets, baths, &c. Mr. James Bowers, of Hereford, has been the contractor for the whole of the works. The carving was entrusted to Mr. Robert Clarke, of Hereford, and the bell-hanging, gun-metal casements, and other works of this kind, were executed by Mr. W. Letharen, of Cheltenham.

HYDRAULIC DIFFICULTIES.

Sir,—Will some of your correspondents kindly help me out of a dilemma? Some time since I bought a house, with the intention of extending it backwards, and by excavating the basement and underpinning the walls to get 8-ft. headway in the basement-floor (there were only 6 ft. originally); but in making the extension we had to build over a well, and the water in this well rises to within 7 ft. of the ceiling, so by the time the dwarf walls, joists, and flooring are down there will be barely 6 ft. between the floor and ceiling. I must state I have an architect and builder, who advised me to have the well concreted. I accordingly had the well cleared out to the bottom, a few stones placed there, and a pump inserted, to keep it dry, to give the concrete time to set. The latter was made of one part Portland cement, one part Plympton sand, and one part limestone chippings, well stamped down, with a cavity in the sides of the well, 9 in. back, to allow the concrete to have a hold. We then saw the water coming up from the hole where the pump was inserted. After thirty-six hours we withdrew the pump, and put clay in the hole, then Portland cement and sand mixed; but in less than fifteen minutes the water was up between the concrete and shillet, or soft rock, and the water is up now to its original level. I must state the basement-floor is about level with the main drain,—perhaps a little below it,—so that it is impossible to carry it into the drains. My architect and builder seem to be at their wits' end, and I appeal to you.

Greenhorn.

Leominster.—A Wesleyan chapel at Steen's Bridge, Leominster, has been opened, the "architect and builder" being, we are told by a Hereford paper, Mr. Hine, of Ludlow.

CHURCH-BUILDING NEWS.

Dearham.—A bazaar has been held at Maryport to raise funds for the restoration of the ancient parish church of Dearham. The work is to be entrusted to Messrs. Cory & Ferguson. It appears that the church has been in tolerably good condition up to 1847, but in that year, owing to the working of a mine in the vicinity of the church, the building began to crack in various places, and the lintels were broken. Mr. Charles Ferguson, in his report on the condition of the church, says,—"The interior of the church is in a deplorable condition. The floor is damp and much decayed; the seats are rotten; the plaster is much injured by damp; and the principal lintel at one of the windows has entirely decayed and fallen out of the wall, leaving the wall above it unsupported except by the mortar." The cost, including provision for increased accommodation, is estimated at 1,750*l.*

Battersea.—On the 10th ult., the Bishop of Rochester dedicated the newly-erected Church of St. Michael, Battersea. The building is situated in Bolingbroke-grove, Wandsworth-common, and is constructed of red and yellow brick, with a timber roof covered with red tiles. It consists of a nave, chancel, and two colonnades, the latter separated from the nave by arcades having octagonal columns of marble, surmounted by Portland stone capitals. The floor is of wooden blocks, and the pews are of the low doorless pattern. It will accommodate about 750 persons, and its total cost will be about 4,500*l.*, of which all but 800*l.* has been contributed by the relatives and friends of the late Rev. H. B. Verdon and Mr. Philip Cazenove, to whose memory the church is erected. Mr. W. White, F.S.A., is the architect, and Mr. J. D. Hobson was the builder.

Sidbury.—Holy Trinity Church, Sidbury, near Bridgnorth, has been re-opened, after restoration, which has been carried out under the direction and to the drawings and specifications prepared by Mr. R. Griffiths, architect, Stafford. The general fabric was found to be in a very dilapidated condition, the whole of the roof having been stripped, and the mortar removed from all the exterior walls. The stone work has been repaired, and partly rebuilt in herring-bone to correspond with the old work. The old timbers in the roof (where required) have been removed, and the space between the rafters plastered and left visible, including the bold oak principals. The roofs are covered with tiles obtained from the Billingsley brickyard. The chancel has a pitch-pine boarded ceiling, formed in panels with moulded ribs. The old porch has been taken down, and a new one built to correspond with the other portion of the work. The stone for the masonry and walling, raised near the church, is the gift of Mr. C. R. E. Cresswell, Sidbury Hall. A new window has been added to the north side of the nave, and the whole of the jambs to the doors and windows thoroughly cleaned down. An entirely new chancel arch has been added. The old stone paving has been removed, and the aisle and chancel paved with Messrs. Maw & Co.'s encaustic tiles. The whole of the seating in the chancel and nave is in pitch-pine, with moulded bench-ends. The pulpit and reading-desk have been reconstructed with the old oak framing, with carved panel fronts. The ancient font has been restored and cleaned. The windows have been re-glazed with cathedral glass by Mr. John Davies, of Shrewsbury. The whole of the work has been carried out by Messrs. Nevett Brothers, contractors, Ironbridge.

Mathern.—Mathern Church, near Chepstow, remarkable as the burial-place of Theodrick, or Teudrick, the hermit-king of Glamorgan, is now undergoing a thorough restoration, and the following interesting information has been furnished by Mr. William White, of Abergavenny, the contractor for the work:—Upon an examination being made of the south wall of the chancel, it was found that the heavy timbers of the roof had thrust the wall 9 in. out of the perpendicular. It was then decided to put the wall back to its former position without taking it down. To accomplish this a strong barrier was erected inside, perfectly upright, and close to the base of the wall. A groove was then cut on the inside at the base, wedge shape, the whole thickness of the wall, and with a little pressure from the outside with screw-jacks, the wall gradually recovered its perpendicular, without the displacement of a single stone; the groove was then underpinned, and the barrier removed. Upon excavating at the base of this wall, under the tablet of King Theodrick, a stone coffin was found, partly filled with dry mould and some bones (supposed to be those of the king). The stone coffin was removed to a place of safety for re-interment. Its dimensions are 5 ft. 7 in. long, exterior, and 5 ft. 3½ in. interior; its width is 20 in. exterior, and 16 in. interior; the depth, 11 in. exterior, and 6 in. interior.

Salhouse.—The restoration of the somewhat singular church of Salhouse is progressing, and (according to the *Norwich Argus*) the building will be re-opened in November. Salhouse is some five miles north of Norwich. Its parish church, dedicated to All Saints, is a plain old building, consisting on plan of chancel, nave, north aisle, and tower. This tower has little affinity with the rest of the church. The late Sir G. Gilbert Scott, R.A., was of opinion that when it was built it was intended to considerably enlarge the church, and he based this opinion upon the fact that the tower in question did not stand in the centre of the nave line, but was centered with the south wall of the nave upon the one hand, and the north wall of the north aisle on the other. By this treatment, he thought, the old men intended to raise the latter wall to the height of the former, construct one roof over the whole, and probably add a north and south aisle. The buttresses that flank each side of the tower quite support this theory. The scheme was never carried out, however; after building some 60 ft. high, and ere the natural terminations of the angle buttresses were reached, a temporary roof was put on, and thus it remained. In the present restoration nearly all the south wall of the nave has been rebuilt in rubble work as before, the old roof of the tower has been removed and recovered, and the steps leading to the tower repaired. The nave roof has been stripped of its thatch, and a strong one of English oak has been erected. This is covered by a layer of reeds to a thickness of about 15 in. A south porch has been added,—the walls being of Trapp flint and the dressings of Ancaster stone. Over the entrance is a richly-carved niche, and the apex of the gable is crowned by a foliated cross in stone. There are three new two-light windows in the south aisle, and one has been put in the chancel. The old remaining bits of ancient stained glass have all been carefully preserved and re-used. The stone carving has been executed by Mr. Harry Hems, of Exeter; the builder is Mr. George Dobson, of Colchester, his general foreman being Mr. George Stow. The works are being carried out from the designs and under the immediate superintendence of Mr. John Oldrid Scott, architect, Spring-gardens, London. The estimated cost of the restoration is 3,500*l.*, but further works are contemplated. The old carved oak screen especially should be cared for.

Bistre.—On the 20th ult. the parish church at Bistre was re-opened, after restoration. The vicar (the Rev. J. N. Evans) found on entering upon his work that the building was in a very unsatisfactory state, and he determined to effect its restoration. The amount required for the restoration was 700*l.*, and the greater part of this sum having been raised, designs were called for, those of Mr. Spaull, of Oswestry, being eventually accepted. The work, which was placed in the hands of Mr. J. Williams, builder, of Buckley, was commenced in May last. The gallery at the west end has been removed, as well as the whole of the interior fittings of the church. The apse at the east end has been raised and ceiled with wood, and the east window, which previously was level with the communion-table, has been raised and filled with stained glass by Messrs. Ballantyne, the subject being our Lord in the garden of Gethsemane. This window is the gift of the Pemberton family of Plas Issa. The last bay at the east end of the church has been raised two steps and rearranged. The choir, reading-desk, and vestry are at the south side of the transept, while the organ is on the north. The body of the church has been filled with open seats, capable of accommodating 400 worshippers; while the aisles have been laid with tiles, and the choir and sacrarium with encaustic tiles from the Pen-y-bont works of Mr. J. C. Edwards.

Waterworks, Milton-next-Sittingbourne.—The works for the water supply of this place have been completed, and were formally opened on the 27th ult. They have been carried out by Mr. Henry Robinson, C.E., of Westminster; the contractor being Mr. George Torkington.

DISSENTING CHURCH-BUILDING NEWS.

Birkenhead.—The Unitarian Church, Charing-cross, Birkenhead, was re-opened on the 4th ult., after various alterations. A new chancel, 17 ft. 6 in. by 12 ft. has been added, with organ-chamber and vestry attached, and having a window filled in with stained glass, the subject being "A Vision of St. Louis on the Shores of Palestine." New glass has been put in all the old windows, and the whole church has been refurnished and decorated. The lecture-hall below has been nearly doubled in size, and cloak-rooms and conveniences added. The whole work, which has been executed by the following contractors, has cost about 1,850*l.* The general contractors for the works were Messrs. Legge & Co. The stained-glass window, ornamental tiling to reredos, and all the decorative work, were by Messrs. Shrigley & Hunt, of Lancaster and London. Mr. Rogerson, of Liverpool, was the sculptor of the reredos; the gas-standards are by Willis & Co.; and the floor-tiling by Craven, Dunnill, & Co. The whole has been carried out under the direction of Mr. James N. Crofts, architect, Liverpool.

North Hykeham (Lincolnshire).—The foundation stones of a Wesleyan chapel and schools have been laid here. The designs of the building were prepared for the builder by Mr. W. Mortimer, architect, Lincoln. It will cost 500*l.*, and will seat 200 people.

Walsall.—A new Presbyterian church is in course of erection here. The church, with schools, vestry, and other accommodation for congregational purposes, is situated at the junction of Hatherton-street and Darwall-street. The church is planned with the principal gable fronting Hatherton-street, and in this will be placed the main entrance. At the angle of the front next to Lichfield-street will be placed a tower 14 ft. square at the base. The lower story will contain the gallery entrance and stone staircase, and above this will be the bell-chamber. The upper part of the tower, exteriorly, will be gabled and pinnacled, and surmounted by an octagonal spire, rising to a total height of about 100 ft. from the ground to the top of the finial. The side elevations of the church to Darwall and Lichfield streets show each four stone traceried windows, two of two-lights and two of three-lights, the latter of which will be carried up to form gablets. The interior of the church will be divided into quasi-nave and aisles by the introduction of a light arcading of timber supported on iron columns. This has been rendered necessary by the adoption of a wide span roof, consequent upon the proportions of the site. The internal dimensions of the church are:—Length, 63 ft. 6 in.; breadth, 45 ft. 9 in.; height, from floor to ceiling in centre, 38 ft. Sitting accommodation will be provided on the ground-floor for over 400 adults; and, including the additional sittings in the gallery over the main entrance, the building is computed to accommodate about 500 persons. The school buildings will be placed at the rear of the church, with the end gable fronting Darwall-street. They will comprise a large room, 32 ft. 6 in. by 24 ft. wide, and four class-rooms, varying in size from 12 ft. by 7 ft. 6 in. to 15 ft. 6 in. by 11 ft. 6 in., thus securing a total accommodation for upwards of 200 children. It is proposed to warm the whole of the buildings by hot air, and this portion of the contract has been entrusted to Messrs. Haden, of Trowbridge. The buildings have been designed in the Gothic style, of the early fourteenth-century period, and are to be constructed of bricks, faced on the fronts with best local pressed bricks. The jambs, moulds, plinths, and strings are also of brick; and the window tracery, sills, mullions, copings, &c., are to be of Bath, Penkridge, and Codsall stone. Interiorly, the church is to be lined with pressed red bricks up to the height of the window sills, thus giving a deep base or dado of colour. Above this the lining is to be of pressed buff bricks, tuck-pointed with red mortar, which it is believed will produce a very clean and cheerful effect in the internal appearance. The interior of the schools is to be lined with brick, neatly pointed, and coloured and painted in approved tints. The woodwork throughout is to be of the best Baltic fir, and the internal fittings are to be stained and varnished. The contract for the various works has been taken by Messrs. William Trow & Sons, of Wednesbury, and they are now proceeding with the buildings, from the plans and under the superintendence of Messrs. John Cotton & H. H. McConnal, architects, of Birmingham and

Walsall, whose joint designs were selected some three years ago. The cost of the buildings, including lighting, warming, and furnishing, is estimated at about 3,000*l.*

STAINED GLASS.

Chelmsford.—A window has been placed in St. Mary's Church as a memorial of the late Miss Ann Baker. Messrs. Clayton & Bell have supplied the window, which is of two lights, and illustrates the texts, "I was an hungered, and ye gave me meat," and "I was sick and ye visited me."

Shoeburyness.—A memorial window has just been placed in the parish church of St. Andrew's, Shoeburyness. The glass is from the firm of Messrs. Cox, Sons, Buckley, & Co., of Southampton-street, Strand, and the window is put up to the memory of Major Lambert, late of the Royal Engineers. The window illustrates passages in the "Pilgrim's Progress," and is intended to represent the Christian pilgrimage.

Dewsbury.—The large south transept window of St. Mark's Church has just been filled with painted glass "in loving memory of (the late) Williamson Metcalfe, of Elmwood House." The window has four chief openings. Each is divided into two compartments by bordures and panels of rich ornament, thus allowing the introduction of eight figure subjects. The groups are richly coloured on a diapered ruby background. The intervening and inframing spaces of ornament are kept chiefly in white and dull blue, with here and there a little golden stain. The widow is the donor of the window, and Messrs. Powell Bros., Leeds, executed it.

VARIORUM.

Beckett's Provincial Builders' Price-Book and Surveyors' Guide (E. & F. N. Spon) is issued on the ground that existing Price-Books are London books, and not applicable to the provinces. If all provincial towns adopted the same system of measuring and the same prices, there would be greater force in this observation than, as it seems to us, there is. The Liverpool Building Act is appended, and the Manchester By-laws, and the book will doubtless be found useful by many. We are bound to say, nevertheless, that we would rather see endeavours made to bring about more general uniformity than to confirm existing divergences. Comparing prices with those given by "Laxton," considerable differences in various items, the provincial being lowest, are found; as to day-work, however, ½d. per hour less is all the difference stated,—10d. per hour, that is, instead of 10½d. —— The October number of the *Antiquary*, a very good one, commences with a short "Study on Poet's Corner, Westminster Abbey," by Henry Poole, Master Mason of the Abbey. The Rev. H. N. Ellacombe contributes the first portion of an elaborate paper on "Shakspeare as an Angler."——"Gleanings from Popular Authors, Grave and Gay," of which part I. comes to us from the ever-active Cassell, Petter, & Co., is intended not alone as a half-hour book, in which will be found some of the best sayings of the best authors, but as a treasury of pieces suitable for reading in public. The illustrations are effective.

Miscellanea.

The Orphan Asylum Building at Clapton.—We are informed that this large and substantially-built structure, erected in 1823, and abandoned a few years since by the removal of the inmates to the new asylum at Watford, is likely to be taken for the purpose of a training home or homes for the young men and women "cadets" of the "Salvation Army." The once beautiful wooded lawn and garden in front and rear of the Asylum were recently parcelled out into building lots, and streets of houses have been erected thereon, and a number of them are at present occupied.

Statue of the Late Mr. George Dawson.—A statue of the late Mr. George Dawson has been unveiled at Birmingham. The statue, which is of white Sicilian marble, is 6 ft. 6 in. in height, and the late Mr. Dawson is represented in a standing attitude, in the act of addressing an assembly, with his right hand crossed on his left. On the four sides of the canopy there will be four medallions of Sicilian marble, consisting of the heads of Shakspeare, Carlyle, Bunyan, and Oliver Cromwell. The work has been executed by Mr. Woolner, R.A.

Proposed Boulevard round London.—The prospectus has been issued of a "pioneer company" to be formed privately for the purpose of providing funds to obtain the necessary Parliamentary powers to make a boulevard round London, the work to be carried out by a public company to be formed when the necessary powers to execute it have been secured. The proposal emanates from Mr. E. L. Paraire, architect, and if carried out will, according to the prospectus, comprise a broad and continuous roadway about twenty-five miles in length, with wide footpaths on each side, planted with trees. Powers will be taken to lay down tramways so soon as roads of sufficient length to be remunerative are constructed. The boulevard will be made in sections, and will traverse the whole of the suburban districts of the metropolis, at an average distance from St. Paul's of about five miles on the east, and four miles on the north and south. Commencing on the north side of the Thames at Cubitt Town, it will pass by Poplar, Clapton, Hampstead, Kensal New Town, to Hammersmith, where it will be joined by one of the bridges over the river, thence to New Brompton (?), Clapham, Peckham, and Greenwich. The greater part of the land required is now free from buildings, and said to be available for the proposed work. The sum to be obtained for the frontages to the boulevard will, it is believed, cover the outlay required for the construction of the works. It is estimated that the ultimate expenditure will amount to 2,500,000*l.* Roughly speaking, the boulevard, as shown on the plan sent to us, will enclose the metropolis in an irregularly shaped oval. The east end of this oval, we notice, is marked on the plan "not surveyed," and it is here that apparently serious obstacles present themselves. On the south side of the Thames Greenwich Park seems to be in the line of the proposed boulevard, and on the north side, the docks at Blackwall appear to offer an obstruction. Is it proposed, as part of the scheme, to erect a bridge across the river at Greenwich? Nothing is said about such a bridge in the prospectus. Mr. Paraire has for many years been considering the subject.

Fire-Extinguishing Apparatus at the New Savoy Theatre.—In a previous issue we mentioned that Messrs. Merryweather & Sons, of Long-acre, had fitted the new Savoy Theatre with fire-extinguishing appliances, and we think it may interest our readers to know that the apparatus differs from any previously fitted inside private buildings in the fact that the hydrants are of an improved form, having a thread which is known as the new Metropolitan Brigade Gauge, and which enables the hose to be more rapidly connected or disconnected with an impossibility of the threads becoming "fouled." The hose is of canvas, tanned, and rubber lined, so as to render it waterproof, and the couplings and nozzle-pipes are also of the new-pattern round coarse thread.

Cheap Cottage Building.—Mr. Villiers Stuart, M.P., in a letter to the Lord Mayor of Dublin, proposes to offer a prize of 50*l.* for the model of the best labourer's cottage, the construction of which should not exceed 52*l.* 10*s.*, which would enable it to be let at 1*s.* per week. Mr. Stuart suggests the model should be arranged in the forthcoming exhibition of Irish industries side by side with the one which Mr. Johnson, of Kanturk, secretary to the Labour League, proposes to send of a Limerick labourer's cabin of the present time, "thus placing in instructive contrast what Irish workmen's dwellings so often are and what they might be."

Tenders at Croydon.—Complaints are made that the Guardians of Croydon Union, after inviting tenders for painting the outside of the workhouse, have given the work to the tradesman they have been in the habit of employing, although the tender of an equally competent person was much lower.

The Annual Dinner of the Builders' Benevolent Institution is announced to take place on Thursday, November 3rd, when the President, Mr. ex-Sheriff Burt, of the firm of John Mowlem & Co., will, we trust, be supported by a large number of the friends of the Institution.

New Southport Market.—The revolving shutters mentioned in our account of this building were supplied and fixed by Clark, Bunnett, & Co. (Limited), who have also received instructions from the Corporation of Oxford to fix their patent noiseless steel shutters to the extension of their city markets.

Chemical Fire Engines.—A practical demonstration of the powers of Dick's chemical fire-engines to arrest fires in their early stages was given last week, the experiments being made by permission of the City Lands Committee on vacant ground near the Thames Embankment. Mr. James Sinclair, of Leadenhall-street, in explaining the trial to which the engines would be put, remarked upon the importance of dealing with a fire before it had got hold of a building. The extincteur "Fire Queen," with which an experiment was first to be made, was filled with an innocuous chemical containing a large porportion of carbonic acid in its composition. At the top of the extincteur and within was a bottle of sulphuric acid, and in order to put the engine in readiness to extinguish a fire it was only necessary, by giving a smart tap on a rod, to break the bottle of sulphuric acid. As soon as this was done carbonic acid was set free from the chemical liquid, and a cock being turned the pressure of the carbonic acid gas formed within the extincteur forced the water out in a strong jet, the water carrying with it a large quantity of carbonic acid. The effect of the carbonic acid on a fire would be seen by the almost instantaneous extinguishing of the burning combustibles that were to be experimented upon. A large pool of tar and petroleum was first set on fire, and the flames put it out in sixteen seconds. The experiment was repeated and the fire extinguished in ten seconds from the time the stream from an extincteur was directed upon it. Other experiments, equally satisfactory, followed.

Pictures for Birmingham.—Mr. Joseph Nettlefold, managing director of the well-known firm of Nettlefolds (Limited), has announced in a letter to the Mayor his intention of bequeathing to the town of Birmingham, for exhibition in the new local art gallery, his valuable collection of oil paintings by David Cox. The paintings, which are twenty-five in number, comprise several of the painter's most admired works, including the "Skirts of the Forest," "Waiting for the Ferry," "The Hayfield," "Change of Pasture," "Rhyl Sands," &c., and are of the estimated value of from 25,000*l.* to 30,000*l.* Among the conditions accompanying the gift will be these:—"That the pictures from the time they are delivered be open for exhibition to the public free of all charge on every day in each year, and not closed earlier than 8 p.m., except for a period not exceeding fourteen consecutive days in each year, when the gallery may be closed for cleaning." "That the room in which these pictures shall be exhibited be lighted in the evenings by the electric light." The offer has been gratefully accepted.

Architecture: University College, London.—Under Professor T. Roger Smith, three courses of evening lectures will be given this session at the College, Gower-street. The subjects treated remain substantially the same as in previous sessions, but such alterations will be made in the mode of dealing with them as, in the opinion of the Professor, may render the lectures useful to students preparing for the Associates' Examination at the Royal Institute of British Architects, or the District Surveyors' Examination, as well as to pupils and other students of architecture; and a public introductory lecture, explanatory of the course and with suggestions as to modes of study, will be given at the College, by Professor Roger Smith, on Monday next, 10th October, at six p.m., admission free. Architects and students of architecture are particularly invited to attend. The full syllabus can be obtained on application to the assistant-secretary at the College.

The Mersey Tunnel.—On the recommendation of the works committee, the Mersey Docks and Harbour Board have assented to a proposal of the Mersey Railway Company to sink a second shaft on the Birkenhead side of the river, so that the works of the proposed headway and main tunnel may be proceeded with simultaneously.

Messrs. S. Owens & Co., of Whitefriars-street, have issued a new section (No. 1) of their Illustrated Catalogue, containing prices of pumping machinery of every description for steam, water, or wind power, self-acting hydraulic rams, &c. It will be found useful.

A Fenman writes, with reference to Mr. G. Hamit's machine for cutting water-weeds, noticed in our last week's impression, page 420, that it is not for "roading," but for "roding." In fen language, *to rode* is to remove weeds from watercourses.

TENDERS

For the erection of new Baptist Church, Handsworth, near Birmingham. Mr. John P. Osborne, architect:—

Moffat	£7,027 0 0
Garlick	6,950 0 0
Barnsley & Son	6,750 0 0
Horsman & Co.	6,490 0 0
Wilson & Son	6,471 0 0
Bennett	6,443 0 0
Webb	6,390 0 0
B. N. Smith	6,250 0 0
Elvins	6,250 0 0
Parton	6,090 0 0
Bloore	6,000 0 0
Sapcote & Sons	5,885 0 0
Horsley Bros.	5,829 0 0
Barker & Son	5,773 0 0
Jeffery & Son	5,600 0 0
Millward's executors (too late).	

For covering and otherwise improving the Waterworks service reservoir, for the Wigton Local Board, Cumberland. Mr. John S. Hodgson, engineer. Quantities supplied:—

Greenwood	£491 12 0
Darlington	389 8 2
Seward	353 11 0
Moore (accepted)	353 2 3

For alterations and additions to residence near Croydon. Messrs. Bernay & Monday, architects:—

Legg	£983 0 0
Coles	959 0 0
Smith	883 0 0

For new road at Stoke Newington, for the Incorporated Society of Licensed Victuallers. Mr. H. J. Newton, architect:—

Palmer	£482 0 0
Killingback	475 0 0
Wood (accepted)	470 0 0

For warming and ventilating by their new hydro-calorique apparatus the dwelling-house and billiard-room, Villa Hermosa, Arcachon, France, for Mr. W. Laird McGregor:—

J. Weeks & Co., Chelsea	£180 0 0

For sewers and roads on the west side of Sir Spencer Wilson's estate, Hampstead. Messrs. Farebrother, Ellis, Clark, & Co, surveyors:—

Anderson	£4,672 0 0
Wilson	4,499 0 0
Maxwell	4,434 0 0
A. & F. Culverhouse	4,200 0 0
Nowell & Robson	4,018 0 0
Watts	3 752 0 0
Killingback	3,195 0 0

For alterations and additions to Point House, Blackheath, to adapt it to the purposes of the West Kent and Greenwich Carlton Club. Mr. A. L. Guy, architect:—

J. & T. Greenwood, Arthur-street West, E.C.	£1,495 0 0
Disney, Blackheath	1,486 0 0
Merritt & Ashby, London-wall	1,436 0 0
Hatfield, Blackheath	1,350 0 0
Higgs & Hill, South Lambeth	1,346 0 0
E. Banks, Lewisham (accepted)	1,345 0 0

For new Mission Church, Algernon-road, Lewisham:—

Colls & Sons	£3,678 0 0
Holland & Hannen	3,611 0 0
Jerrard	3,571 0 0
Goddard & Sons	3,563 0 0
Blake	3,555 0 0
Perry & Co.	3,485 0 0
Patman & Fotheringham	3,375 0 0
Havell	3,320 0 0

For villa residence, Orbel-road, Surrey-lane, Battersea. Mr. C. F. Fenton, architect:—

F. Warr, Neville-road, Croydon	£606 0 0
T. Beanchamp, Brentford End	554 0 0
R. P. Barnes, Bedford Park, Chiswick	547 0 0
T. Hiscock, High-street, Hounslow	491 0 0
R. Squelch, Hurmur-road, Egham	427 0 0
W. B. Prentice, Devonport-road, Shepherd's-bush (accepted)	390 0 0

For additions and alterations to Collingwood Park, Camberley, for Colonel Lampriere. Messrs. Harrison & Cooper, architects:—

Martin Wells & Co., Aldershot	£1,205 0 0
William Watson, Ascot Heath	1,183 0 0

For alterations and additions to 5, Wimpole-street and Harley-mews. Mr. A. E. Hughes, architect. No quantities supplied:—

McLachlan & Sons	£2,770 0 0
Simpson & Sons	2,630 0 0
Williams & Sons	2,515 0 0
Downs	2,217 0 0

For repairs, &c., to 27 and 27A, Sackville-street. Mr. Wimperis, architect. Quantities supplied:—

Curtis	£1,218 0 0
Patrick & Sons	1,215 0 0
Scrivener & Co.	1,199 0 0
Fish	1,174 0 0
McLachlan & Sons	1,124 0 0
Langmead & Way	1,067 0 0
Hatfield & Sons	980 0 0

For lowering, widening, sewering, metalling, &c., a portion of Shepherd's-hill-road, for the Hornsey Local Board. Mr. F. de Courcy Meade, surveyor:—

Walker, Upper Holloway	£2,879 0 0
Josh. F. Meaton	1,450 0 0
Pizzey	1,397 0 0
Daymore	1,389 0 0
McKenzie, Williams, & Co.	1,338 0 0
Strachan & Co.	1,259 19 4
Thomas Rowley	1,220 0 0
Randell & McDowell (accepted)	1160 0 0

For repairs of sea walls and construction of groynes and outfalls for the Commissioners of the Level of Tendring, Essex. Mr. Wm. Berrell, engineer. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Hill & Co., Gosport	£9,632 0 0
J. Botterill, Cannon-street	8,103 0 0
C. Chamberlain, Littlehampton	7,073 0 0
Sarnes & Co., Crayford	6,924 0 0
E. Harrison, Peckham	6,350 0 0
R. Tyler, Kensington	5,893 0 0
Saunders & Son, Deedham	5,830 0 0
A. F. James, Hythe	5,801 0 0
G. Hunter, St. Peter's Park	5,678 0 0
J. Moran, Harwich	5,641 0 0
R. Walker, Lynn (accepted)	5,132 0 0

For enlargement and repairs to Hawkwood, Chingford, Essex. Mr. F. Boreham, architect:—

Morter (accepted)	£1,547 0 0

TO CORRESPONDENTS.

Churches of Buckinghamshire.—The writer of the letter on this subject in our last says, "By an oversight I left out the words 'of Northamptonshire' before Raunds and Higham Ferrers."

F. C. (already noticed).—H. M. (last week).—Z. (received).—H. J. N. G.—R. B.—Dr. P.—S. S.—E. L. P.—H. & Co.—J. McL.—W. E. M.—T. S.—A. W. H. W. P. B. B. E. F.—J. T.—O. T. C.—D. W. C.—Y. H.—J. L.—J. B.—C. F. P.—C. B. & Co.—E. Van P.—J. H. R.—R. R.—W. E. H.—P. Bros.—T. L. W.—C. C. H. J. D. W.—W. W. L.—J. S.—H. H.—A. W. B.—*Re* Dr. W.—M. & Co.—A. L. G.

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The Builder.

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A Chaldean Temple.

DISCOVERIES which have resulted from the expedition of 1880-1881, which that able explorer, Mr. Hormuzd Rassam, has just concluded in the Tigro-Euphrates Valley, will be of particular interest to the students of ancient architecture and archæology, as they afford us valuable information on both of those subjects. The explorations carried out by Sir Henry Layard and others on the ruins of ancient Nineveh have furnished a considerable number of data on which the architect can base his restorations of these ancient cities, and the learned researches of Mr. James Fergusson and others have done much to place before us the appearance which the vast palaces of Assyria's kings presented to the eyes of those who visited living Nineveh. The explorations at Nimroud, the ancient Kalakh, the capital of the Middle Assyrian empire, have restored to us numerous examples of the art of Assyria at a time contemporaneous with the building of the first temple of the Jews, while the richer remains from the palaces of the Sargonide kings buried beneath the mounds of Koyunjik or Khorsabad afford us examples of the art and architecture of Assyria at the period of its highest development. From the monuments recovered and the buildings explored, the student has been able to gain a considerable knowledge of the progress which the Assyrians made in the construction and decoration of their palaces and temples. Still, however, there was a great desire for some information as to the earlier stages of the nation's art development, and especially for some examples of the earlier art of the Southern empire of Chaldea, the land out of which Assur went forth. The more we examine the art and the civilisation of the Assyrian empire, the more strongly is the fact of the deep indebtedness of the Assyrian to his Chaldean instructors impressed upon us. The letters in which the history and legends of the empire, and the accounts of the works carried out by the kingly builders in the construction of palaces and temples are recorded, were first taught to the receptive Assyrian by the Chaldean; the first problems of mathematics and science which enabled him to so accurately construct the chambers of his palaces and the main basis of his building construction, were all first learned in the schools of Chaldea.

There has, therefore, long been a desire among students of the archæology of Western Asia for some example of purely Babylonian sculpture, and for the discovery of some fairly preserved edifice, either palace or temple, which might afford us a basis for the study of Babylonian architecture. Hitherto the explorations in Babylonia, with the exception of those conducted by the late Mr. Kennet Loftus, have been signally void of results in the fields of art and architecture; and the engraved cylinder seals, numbers of which are to be found in nearly all the national collections, were almost the only examples of Babylonian art extant. The explorations conducted by Mr. Loftus on the ruins of the sites of the oldest Chaldean cities of Ur (Mughhier) and Erech (Warka) brought to light the remains of some of the most ancient Chaldean temples, and these served to show that a distinct style of national architecture prevailed in the Southern empire. It was also evident that this style was due to certain local peculiarities. The scarcity of stone, and the abundance of the finest brick-making clay, caused a style of construction, in which brick was the chief material employed, to be adopted, while stucco and painted plaster were the chief means of decoration. The story of the foundation of Babylon, as transmitted to us by the Hebrew writers, has preserved to us a record of this fact, in the statement that the materials used for the great tower which formed the centre of Babylon were bricks, —"Come, let us make brick,"—(Gen. xi. 3), and the durability of the structure was still further ensured by the use of kiln-burnt brick in preference to sun-dried brick. The buildings discovered at Warka exhibited some ingenious forms of decoration by the use of cones and coloured bricks, and by the employment of floriated inscriptions as decoration for walls and the capitals of columns and the cornices. It would be interesting to find if this mode of decoration by conventionalised inscriptions, which was carried to such a state of perfection by the Arabic artist scribes, was transmitted to them from the still more ancient decorators of Assyria and Babylonia. The discoveries made by Mr. Rassam in 1878-9 in the Mujelibe mound brought to light the first edifice which had been discovered on the site of the ancient city of Babylon, and the remains found afford strong proof of the accuracy of the statements of Herodotus, Diodorus Siculus, and the writer of the Book of Daniel, as to the construction of the palace residences. The large chamber or banqueting-hall discovered by Mr. Rassam, was decorated with painted walls and cornices and mouldings of plaster inlaid with fragments of coloured clays and composition. But if the discoveries made on the sites of Ur, Erech, and the capital city of Babylon, had failed to provide the examples on which a systematic study of the architecture and art of Chaldea could be commenced, the discoveries made by Mr. Rassam during the expedition which he has just concluded, furnish much that will serve to lay the foundation of such studies. The value of the remains discovered is most materially increased when we find that they come from a city whose traditions and history as a religious centre are far older than those of great Babylon.

The traditions of the city of Sippara, the great Chaldean Heliopolis, go back far into the mythic age of Babylonian history, and it is the site and ruins of this city which Mr. Rassam has found to be marked by the extensive ruins known to the Arabs as those of the mound of Abboo Hubba, "Father of a kiss," situated some six miles from the east bank of the Euphrates. While at Baghdad, Mr. Rassam heard from the Arabs of some ruins where "written stones" were to be found, situated on the banks of an ancient irrigation canal, now called Nahr Yussifieh, which we may certainly identify with the Nahr Malcha of Herodotus, which once connected the streams of the Tigris and Euphrates. It is clear that this very winding canal is not a pure work of human skill, but is rather the result of the artificial junction and clearing of two tributary streams,—the one flowing eastward into the Tigris, the other westward into the Euphrates. This stream is called by Strabo, Nahr Ragam, a name evidently of Chaldean origin. The mounds to which the Arabs directed Mr. Rassam's attention were called Deyr, and were situated on the north bank of the canal, about eight miles from the Euphrates. The excavations made in these mounds brought to light but little of importance beyond bricks inscribed with the name of the great builder, King Nebuchadnezzar the Great (B.C. 605). As bricks of this monarch are found in almost every mound in Chaldea, and as they gave no indication of the name or nature of the edifice of which they formed part, the result of the test trenches was not regarded at all as very satisfactory.* While engaged on the work at Deyr, Mr. Rassam visited some of the surrounding mounds, and his attention was especially called to a group of mounds of large size, about four miles south-west, bearing the name of Abboo Hubba; and so attractive were these dust-heaps to his experienced eye, that he abandoned the work at Deyr, and transferred his workmen to the new and more promising site, and was soon rewarded for his work.

The ruins of Abboo Hubba are situated on the south bank of the Yussifieh canal, about thirty-five miles south-west of Baghdad, and less than six from the west bank of the Euphrates. The ruins, as clearly drawn in the excellent maps of Babylonia by Col. Selby and Lieut. Brewster, at once suggest the site of some ancient town as the position of the citadel, and the lines of walls enclosing the city can be clearly traced. The line of earthen ramparts which mark where once stood the city walls enclose an area of about 4,000 yards in circumference, and in shape a perfect parallelogram, with the angles to the cardinal points.† There are severa

* The modern Arabic name Deyr would seem to indicate that these ruins were those of the ancient city of Dur-an, or Dur-el, "the Fort of God," situated in this district.

† This was the usual mode of laying out a building in Babylonia, the Birs Nimroud, the temple at Ur, and others, all exhibit this mode.

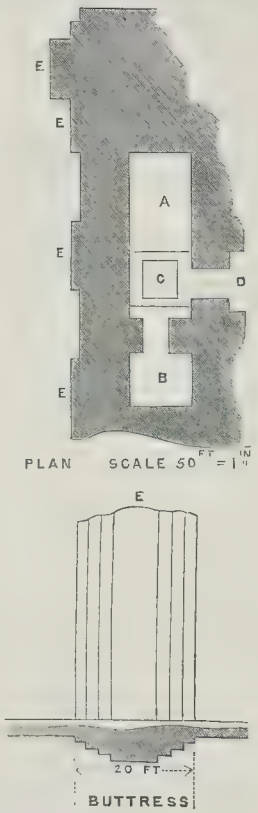
breaks in the line of ramparts, which serve to show where the gates giving entrance to and from the city were placed; and the north-east and north-west faces of the city appear to have been protected by deep and carefully-dug canals or ditches. The axis of the large mound which marks the site of the acropolis or citadel nearly bisects the city enclosure, but the greater accumulation of *débris* is on the south side of the city, and the highest point of the acropolis adjoins the western wall of the city.

Excavations were commenced on the south-west face of the mound on the highest part, and the trenches and tunnels driven into the mound * soon reached a line of walls running nearly due north and south, these were found to form the external face of a quadrangular building, one face of which was from 1,500 ft. long.

These outer walls exhibited a style of architecture or construction similar to that in use in the ancient cities of Ur and Erech, whose ruins had been explored by Mr. Loftus. The walls were of very great thickness, over 20 ft. in places, and were faced with kiln-burnt bricks, the interior being of sun-dried bricks and clay blocks, similar to the construction of the walls of the second and third cities discovered by Dr. Schliemann at Troy. The external face of these walls was divided into equal compartments by a series of buttresses, which projected about 3 ft. or 4 ft. from the face of the wall, and were 20 ft. in width. These buttresses were decorated by a series of mouldings running lengthways, somewhat resembling ploughing, the construction being similar to that of the walls of the temple of the Moon-God at Ur.† In some of the bas-reliefs, which illustrate the wars of Sennacherib and Sargon in Babylonia and Chaldea we see this mode of decoration represented. The upper portion of these external walls was entirely lost, but judging from the examples of this style of construction, which are shown on the bas-reliefs from Assyria, we may conclude that the walls were crowned by castellated ramparts. Shafts sunk in the interior of the mound, in order to penetrate into the building whose external walls were thus discovered, led to the discovery of remains which showed that the building consisted of a series of chambers and corridors built round central courts, a mode of arrangement similar to that in use in Assyria, and in the temple of Belus at Babylon. The large inner court, round which the chambers were ranged, was probably the court, called in the inscriptions discovered on the spot, the court of the Sun God,—the deity to whom the great temple was dedicated. The outer court was dedicated to this god Bel. Having penetrated into the interior of the great building, Mr. Rassam followed the south-west wall of the inner court, and after finding the doorways was able to lay bare a number of chambers and corridors. Most of the rooms were pairs,—first, a long chamber or gallery, and then leading out of this a small chamber.‡ Access to the chambers was gained by a doorway from the larger chamber into the courtyard. One especially interesting pair of chambers was uncovered which formed the temple of the Sun God, and the value of these remains will be seen when we consider that their erection was nearly contemporary with the building of the first Hebrew temple, to which in plan they present many striking similarities. In the pair of chambers discovered by Mr. Rassam, we have the temple proper, consisting of the parts which correspond to the *naos* and *cella* of Greek temples. The outer chamber measured 110 ft. in length by 35 ft. in breadth, and was entered by a doorway 16 ft. in breadth.§ At the south-east end of this larger chamber was a doorway leading into the smaller chamber or cella, the dimension of which was 35 ft. by 40 ft.‖ A second doorway led out of this smaller chamber into the priests' quarters.

The clearing out of the larger chamber, or naos, brought to light the fact that here stood the great sacrificial altar on which the victims,—sheep, oxen, and rams, were offered.¶ The existence of this altar of burnt-offering in this outer chamber would certainly seem to indicate that the construction of the naos was hypæthral or unroofed. This outer chamber corresponds to the "holy place" of the Jewish temple, the Assyrian name of which exactly corresponds to the Hebrew, being *hekal*, "the great house."** The altar, which formed the principal feature in this outer chamber, was constructed of brick, and was nearly a square of 20 ft.

The Babylonian altars appear to have been constructed with great care and exactitude, and



like the altar in Solomon's temple the Babylonian altar of sacrifice was a square. Dr. Tibhant has shown before the Oriental Congress of London that the commencement of Indian geometrical science was due to the care with which altars were constructed. We know in the Zend Avesta, and in Vedic hymns, the special care expended on the building of the altars. The smaller chamber, or cella, was called by the Assyrians and Babylonians the *parraku*,* or "divided off portion." It is important to find that this word was cognate with the Hebrew name of the veil or dividing partition in the Jewish temple. The parraku was also another name for the harem or divided off portion of the palace, and the princes were called the dwellers in the parraku. This portion of the Babylonian temples was certainly roofed, as both Assyrian and Babylonian monarchs speak of the rich cedar and gold-plated roofs, which they added to temples of Bel and the gods of Babylon. Like the Holy of Holies of the Jewish temples, the walls and ceiling of this dwelling of the god were covered with gold. The most important use, however, of this holy chamber was that of being the place in which the records and dedication deeds of the temple were placed. In the temple at Nimroud or Calah, in Assyria, which was discovered by Sir Henry Layard, the record of the building of the temple and the great deeds of the king were written on the pavement of the parraku or cella. In the temple of the war-god at Balawat, which we have already described, the foundation records were found in a cist placed near the altar. The most precious Hebrew writings, the tables of the Decalogue, were placed in the ark in the Holy of Holies, in the Jewish temple,—so in the cella or parraku of the Babylonian temples the writings were placed under the immediate protection of the god. Guided by his explorations at Nineveh and Balawat, Mr. Rassam proceeded to search for the foundation records. This inner chamber was paved with a hard composition resembling asphalte; cutting through this pavement a shaft sunk came upon the foundation records, enclosed in a cist. The cist at Balawat was of stone, but the scarcity of this material in Babylonia, which exercised so great an influence on Babylonian architecture, had caused the Babylonian priests to enclose the records in a large cist of terra cotta.

In this record-chest were three royal deeds or charts relating to donations and endowments of the temple. These records were of two kinds, such as have been fully described by us in our former article, "Babylonian Foundation-stones." The first was a stone tablet of Nabu-bal-iddina, king of Babylon, B.C. 860, the contemporary of Assur-nazir-pal and his son, Shalmanesar II. The other records were inscribed barrel cylinders of Nabonidus, king of Babylon B.C. 555. The first of these records appears to relate to the foundation of this portion of the temple, and is dated on the 20th day of Nisan, the first month of the thirty-first year of Nabu-bal-iddina, which we may place at B.C. 850. Records somewhat similar to these tablets of Nabu-bal-iddina were found at Ballawat; but there is one important difference, in the Babylon example the aid of the sculptor has been employed as well as that of the scribe to bring more clearly before posterity the greatness of the god whom the king honoured. One-third of the obverse of this tablet is occupied by a panel, with a mythological tableau sculptured in low relief. In arrangement this record-tablet presents somewhat of a similarity to the Egyptian funeral tablet, both divine or mythological figures and those of historical personages being blended in the same field. The inscription which covers the remainder of this tablet, and extends over 200 lines, is most valuable to archæologists, as in it we have a very accurate account given of the dedication of a votive statue to the temple of the Sun-God, of its construction, and the name of the sculptor who was commissioned to execute the work. In thanksgiving for a victory gained over the Sutu, a northern Elamite tribe, the Babylonian king commissioned a priest of the temple, who was also a sculptor, to make a statue of the Sun-God for the temple, and also to carve and inscribe this memorial tablet. The priest-sculptor was named Nabu-suma-iddina, and was a priest or augur of the temple of the Sun-God. The statue was made of marble, which was obtained from the city of Kar-akna, "The Marble City," on the Euphrates. Having made the statue, the artist submitted it to the king, and the inscription on the tablet reads, "The statue of the Sun-God, the great Lord skilfully he made, by the aid of Hea and Merodach, the form of the Sun-God in the house of marble, which is on the banks of the river Euphrates. Its surface he purified and raised on its seat. The King of Babylon, Nabu-bal-iddina, in his heart had imagined this statue, and he saw the design according to Nabu-suma-iddina, the priest of the temple, and inspected its form. Over the bright image and its glorious design he poured out the joyful pleasure of his eyes." The inscription thus preserved to us is very valuable, as it furnishes us with several valuable technical terms, such as the word for statue, as distinct from a bas-relief, the verbs "to carve," to cut an inscription, and the nouns, image, design, and pedestal. But the information which this valuable record gives is not confined to the inscription; for by means of the carved tablet, which forms an illustration to the text, we are able to see very clearly the nature of this image. Like the statue of Ate in Troy, it was a seated figure of the great god. Similar statues have been found in various parts of Mesopotamia, such as the statue erected by Assur-nazir-pal at Assur or Kileh-Shergat, and the most ancient example of Babylonian sculpture, the statue erected by the primitive Babylonian monarch Gudea at Zergul.* This latter statue is now much mutilated, but the inscription on its base was copied by Mr. Rassam during his expedition of 1878-9. In this statue, carved by Nabu-suma-iddina, the Sun-God is represented as an aged man seated on a throne without a back. He has long thick locks, and a beard reaching to his waist. This form of the hairy Sun-God or solar hero is common to all mythological systems. The Greek Helios was yellow-haired or long-haired; so, in like manner, was Apollo of the Greeks, Baldur of the Norsemen,

* The area is about 1,800 ft. by 1,500 ft.
† See diagram, E. ‡ See A and B. § D on plan.
‖ B on plan. ¶ C on plan. ** A on plan.

* B on plan.

* The ruins of this city were discovered by Mr. Rassam in 1878-9, and are called Tel Ho, the Mound of the Idol.

and Isdubar or Nimrod of Babylon. There is a fine figure of this hero in the Louvre at Paris, which shows the hairy character of the Solar hero. The Sun-God's image is placed beneath an arched open shrine, which bears a remarkable resemblance to a baldachino, and is clearly the class of shrine called in the inscriptions *papakhat*. The form is supported by rusticated columns, which are clearly derived from the trunks of the palm-tree, the capitals and base being Ionic, and apparently of copper or stone added, the shafts being jointed on to them. The field is occupied by emblems of the sun and moon. The seat on which the deity sits is of wood or ivory, and carved, the seat being held up by two compound figures, half men and half bulls. The mention of robes in the inscription shows that it was the custom of the Babylonians to drape their statues, and this may in some degree account for the little care expended on the carving, and for the anatomical inaccuracy which they exhibit.

One remarkable feature in this work of art is the great and painstaking attention which has been expended on the carving of the panel, almost every curl in the hair and beard, the folds in the robe, &c., being most carefully cut. The whole bears a close resemblance to the minute work of the cylinder seals. Before the shrine we see Nabu-bal-iddina, the King, Nabu-suma-iddina the sculptor,—and one of the priests of the temple engaged in the worship of the solar disk.

The discoveries which have resulted from the slight explorations conducted by Mr. Rassam at Abboo Hubba have restored to us sufficient remains to show that the Chaldeans of the tenth century before the Christian era had distinct styles of art and architecture of their own, and that beneath the grave mounds of the Chaldean plain remains of their work exist, and it is to be hoped that further explorations will bring to light many more examples of the art of Babylonia, and thus restore to us the earliest chapters of the art history of Western Asia.

YRIARTE'S "FLORENCE."

The beautiful work on Venice, which M. Yriarte brought out some time since, and which we noticed fully at the time, has now a companion in the same author's newly published work on "Florence."* After Rome, these two cities stand without rivals in Italy in their historic and artistic interest. Neither of them, of course, comes near to the interest and importance of the "eternal city" in these respects; but Rome is a world in itself, and stands, in its endless variety of objects and associations, out of the category of cities which can be treated of in a monograph. Under her, however, Venice and Florence divide the prime interest of Italy; and it is curious how appropriately the two seem to stand in contrast and complement to one another. Venice represents Italian life impregnated with Oriental ideas and feeling; Florence is essentially a city of the Western world. Venice is the city of romance, of colour, of picturesque effect; Florence is the city of calm discriminating culture, of art flourishing under a *régime* of sound sense and clear æsthetic perception. The very architecture of the two cities carries out and illustrates the contrast. The prevalent character of Venetian architecture is romantic; it ignores rules and follows the dictates of a rich and exuberant fancy. The architecture of Florence is refined, grandiose, practical; but, in comparison with that of Venice, somewhat cold and formal. Take the Pitti Palace as the type of Florence, and the Doge's Palace as that of Venice, and we seem to have in those buildings not inapt external illustrations of the respective character and associations of the two cities. The contrast between the cathedrals of the two cities is less significant, inasmuch as the style of "St. Mary of the Flowers" is, in fact, much less Florentine than that of most of the principal buildings of the city, architecturally considered, though the history of the dome and of the practical knowledge and readiness displayed by its architect is characteristic of Florence; and we may feel sure that if there had been a Brunelleschi in Venice when St. Mark's was built, the building would not have been left in danger of slipping into the water off its foundations. But the domestic and palatial architecture of the two cities is the most significant of their character. The Florentine architecture, in its most typical form, is somewhat cold and deficient in picturesque elements; but in its aspect it seems to boast of such a completeness and logical suitability of design, such a stateliness and largeness of style, that it can afford to dispense with the mere prettinesses of picturesque variety. And this cold and rather self-satisfied æsthetic correctness was the intellectual character also of Florence in her great days. Her literature was a revived classicism, studied, correct, but somewhat cold and occasionally pedantic; her politicians were wary, cold-blooded, and crafty. Through the whole Florentine ideal of life there ran the predominance of intellect over mere sentiment. This is illustrated in the very countenances of the eminent men of the great days of Florence; and as we turn over M. Yriarte's profusely-illustrated pages and glance at the numerous portraits interspersed through them, we are reminded of the words of the Florentine "commissary of the Republic" in Browning's "Luria," who explained to his hearers that Florence had nothing to do with individual interests and fancies:—

> "Florence exists because these pass away;
> She's a contrivance to supply a type
> Of man, which men's deficiencies refuse."

This classification applies, however, more decidedly to the politicians, poets, and *dilettanti* of Florence than to the artists. If her poetry and her architecture were somewhat coldly correct and *rangés*, there were among her painters and sculptors fiery souls who broke through the Florentine ideal of sweetness and light, and became beacons for all time; but these men were hardly representatives of Florentine character and Florentine art, they were above it. Indeed, the same might be said of her greatest men generally. The three greatest names in connexion with Florence are indisputably Dante, Savonarola, and Michel-angelo, and they were all at bitter war with Florence, and, as regarded her society, they were *hommes incompris*. In this, again, how different from the case of Venice, where the greatest names in her art, Titian and Giorgione, were Venetian to the backbone.

In giving his birdseye view of Florence, M. Yriarte devotes an introduction to some general considerations, the place of Florence in the modern world, the art of Florence separately considered; then we have a summary of the general history of the city, followed by a much larger and fuller chapter devoted to the history of the Medici; the further distribution of the work is into chapters on "The Renaissance," on "Illustrious Florentines," on "Etruscan Art" (viewed as the parent of Florentine art, we presume, but this seems rather far-fetched), and on the public monuments, the sculpture, and the paintings of Florence. The introductory chapter may be briefly dismissed, merely noticing that the author regards Florence as in a sense the school from which the modern mind has learned, and in fact appears to take very much the same view which we have above expressed as to the especial correctness, refinement, and completeness characteristic of the Florentine ideal. She is, he admits, less grand than Rome, less strange, rare, and picturesque than Venice, but she has the pervading charm of culture and intellectual refinement in their highest and rarest form. To use the author's own words, — "Aujourd'hui encore, le marbre, le fresque, le manuscrit élaborés à celle époque fortunée, à Florence ou par un Florentin, portent un cachet unique et rare, quelquechose d'indéfinissable qui est fait de distinction suprême, de noblesse, de grandeur, de calme, de force et d'élégance discrète et contenue." Florence, in fact, is the only name which it is at all possible to group with that of Athens, the only city which can have any claim to be named in the same breath with Athens as the parent of æsthetic culture.

According to M. Yriarte's way of putting it, Florence is, in fact, artistically a descendant of Athens, in the sense that the characteristics of her art are those of Greek art revived. This is a theory which must be taken *cum grano*. In architecture, at all events, Florence is not the equal of, nor in the same category with, Athens, any more than any other city has been. There is to be found nowhere that intellectually perfected detail which distinguishes the Greek columnar style. Such a building as the Pitti is the nearest which she has to show to Greek architecture in regard to logical completeness in every part; but the style of the Pitti is, as every one must admit, a very coarse one compared with even inferior Greek architecture. In the Duomo and the Campanile, the latter especially, there is much more of grace and beauty, but here in turn the defect lies in the unsatisfactory treatment of detail. The style is one combined from the Gothic and Classic elements, which the Florentine architects, however, were not able properly to join into one; and throughout all the details even of the Campanile (which is superior work to most of the Duomo) we are continually conscious of an uncertainty of style, and even occasionally a feeling that the architect is trying to use details which he does not fully know what to do with. This is apparent, for example, in the tracery in the windows of the Campanile, which has the general appearance of a quasi-Gothic tracery, but when examined in detail is found to be clumsily put together, with some confusion as to plases and mitres, quite unlike the complete and finished way in which true Gothic tracery in the best form is worked out; and throughout the Campanile and the Duomo there is a clashing of Gothic and Classic feeling (leaving out of the consideration the dome, where we naturally expect this) which detracts very much from our satisfaction with the architecture from a critical point of view; not to speak of the radically unsatisfactory effect of a veneered architecture on a great scale, which has been often commented upon. When, however, we consider the Florentine sculpture, there is more obvious ground for the idea which connects it historically with Greek art. There is about the great works of Florentine sculpture a certain simplicity, reticence, and (to a certain degree) of stiffness of style, which strongly recalls Greek art of a slightly archaic stamp, and it is here, perhaps, that the view suggested by M. Yriarte becomes plausible or probable.

Tuscany was, as he observes, a region peculiarly privileged, centuries before the efflorescence of Florentine art. Etruria had an art of her own, remarkable for its naïve and realistic character, as far as its authors' technical abilities served them; and when Etruria became subject to Greece, it is natural to suppose that Greek art would have had a kind of new or special form of existence there, arising from the impression made by Greek genius upon native Etruscan art. Something of the simplicity and severity of the latter element would be retained, while the Greek element would give a new impulse and power to the native art. M. Yriarte engraves two bronze works from the Uffizii Museum, one the well-known chimera, the resemblance of which to archaic Greek is remarkable; the other a less popularly known bronze of an orator in the act of speaking, with outstretched hand. In this latter figure there is certainly much that is suggestive of early Florentine sculpture, in its simplicity of design and style, earnestness of expression, and even in the somewhat incorrect proportions and modelling. M. Yriarte draws attention to this coincidence in taste and style, without attempting to deduce any direct conclusions from the circumstances. He leaves it to another, he says, to investigate whether, between that art which died 280 years before Christ, and that which arose in Florence fifteen centuries afterwards, there was any secret analogy; whether the Florentine genius of Donatello was really the genius of old Etruscan sculpture, purified by a new civilisation. There is certainly enough artistic relation between the two,—whether accidental or not,—to be worth remarking upon. But with Rome coming in between, it seems to us that Etruria must have been pretty well eliminated. Certain Etruscan forms influenced Roman architecture, of course, notably; but, as to sculpture, we should take it as a matter of course that every trace of Etruscan *naïveté* had disappeared in the sculpture of the empire, which had assumed a character altogether its own,—the art of a wealthy and lavish society where there was no earnestness or simplicity left,—where all was show and ostentation. Roman sculpture only resumed something of this *naïveté* when it began to decline in execution, and it then may be said to have approached the Etruscan character again in a sense, but only inasmuch as it fell into a kind of second childhood, and showed some of the same weakness of execution which belongs to a half-formed as well as to a decaying art. It is with this late Roman sculpture that M. Yriarte thinks early Florentine sculpture is directly connected, especially

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* Florence. L'Histoire—Les Médicis—Les Humanistes—Les Lettres—Les Arts. Orné de 500 Gravures et Planches. Deuxième Edition. Par Charles Yriarte. Paris: J. Rothschild, 13, Rue de Saints Pères. 1881.

through a certain class of sculptures,—those on the Sarcophagi; and he compares a Roman sarcophagus of the epoch of the empire with an antique sarcophagus now in the Ricardi palace, and formerly belonging to the Medici family, and of Christian workmanship. The bas-reliefs on the latter may be said to stand very well as a connecting-link between the work of the empire on the one hand, and that of Early Florence on the other hand. These ancient Christian sarcophagi, being carefully preserved as the memorials, and in fact, in a sense, the coffins of ancestors, remain also as models and suggestions at the revival of sculpture.

"The Campo Santo at Pisa shows us, under its spacious portico, sarcophagi which date from the epoch when Pisa counted among the important colonies of imperial Rome; the others have been transported from the East, or from Sicily and Calabria, and they date from the Middle Ages. In the eleventh and twelfth centuries, when the Pisans built the dome and that leaning tower which attracts travellers to Pisa from all the world, they took to decorate the exterior of the basilica those beautiful sarcophagi, of which the sculptures, which they were still unable to reproduce, struck them most. If, then, some great personage died, they found no tomb more worthy of him than that stone sculptured by ancestral hands. The Countess Beatrice, mother of the famous Countess Mathilde, and the Pope Gregory VIII., who died at Pisa in 1187, repose in such antique tombs. Charlemagne himself has for his tomb a Roman sarcophagus representing the burial of Proserpine; St. Andreol occupies the place where once reposed the remains of Tiberius Julius Valerianus, whose ashes have been scattered to the winds by Barbarian hands. The sarcophagus is, then, the link that binds together the past and the present; it is the instrument of the regeneration of sculpture; and when a man of genius shall stand meditating before the subjects which adorn the sarcophagi and compare the movement, the life, and the anatomical knowledge of the ancient sculptors with those of the stone-cutters employed in the construction of the dome, by a supreme effort he will endeavour to shake off the yoke of the Byzantines, the archaic stiffness and regulation order of the early Christian artists, who confine themselves to the production of symbols rather than sculpture, and he will have the glory of having freed Italian art and founded the school which will have regenerated the world of art." And this "coming man" is Nicolo Pisano, who "will play in sculpture the same part which Giotto played in painting and Dante in literature in Italy. And Pisano is a Tuscan born, so that the art born in Etruria is born again in a town of Pelasgic inhabitants a few leagues from Florence and from the Fiesole of the Etruscans." This, if a little fanciful, is not too much so to be reasonable also, and is at least very brilliantly put.

Sculpture is the only great Florentine art in regard to which this question of relationship with the past can afford much ground for discussion. Painting had no past to refer to; and the genealogy of Florentine architecture, mixed as it is, is obvious enough. There are two other historical chapters in connexion with Florence, however. There is the history of Florence herself, and there is the history of the remarkable family of merchant princes who are so intimately connected with her greatness, and to whom, indeed, M. Yriarte devotes far more space than he does to the history of the city itself. This disproportion, as it seems at first sight, may be explained and justified on the ground that the author's work is intended to treat of Florence mainly as she appears to the artistic eye, and in this light the influence of the Medici is of the highest importance. Touching, however, on the history of the city, M. Yriarte refers to the various theories about her origin, the most generally supported view being that Florence is Etruscan, or, at least, that she has partly arisen from the *débris* of the last Etruscan cities subjugated by the Romans. Machiavel makes Florence a Roman colony founded by some of Sylla's legions; but in the days of Machiavel history did not aim at scientific exactness, and to regard a theory as probable would have been sufficient reason to publish it as ascertained fact. Modern science, says the author, has persisted in seeing in the new city on the banks of the Arno the result of emigration from the heights of Fiesole:—"Fiesole, si belle sur sa haute colline d'où on suit le cour de l'Arno en comptant un à un les dômes superbes et les hauts campaniles de la ville des fleurs aussi séduisante par son aspect qu'elle est attachante par son histoire." M. Yriarte hardly lets us understand which theory he himself favours, unless he identifies himself with "modern science." It may be observed that the Fiesole theory, on the face of it, goes to justify Mr. Ruskin's somewhat fanciful title of his work on principles and axioms in art, "The Laws of Fiesole"; though, after all, it does not follow, because Florence emerged, materially speaking, out of Fiesole, that she drew her artistic life thence.

The lily is the proper emblem of Florence, but the arms of the Republic were continually being modified with each leading event in her history; events which we must pass over for the most part, and which are only briefly alluded to by our author. It was in the twelfth century that Florence, Pisa, Sienna, Arezzo, and Pistoia, constituted themselves republics. In the early part of her history, Florence was a kind of vantage-ground for the battle of the two celebrated factions, to become famous as Guelphs and Ghibellines, with the German Emperor pulling the wires, at the commencement of the feud at least, which, however, after that seemed to have no difficulty in keeping itself going, by the pure and unadulterated hate of the two parties, up to about the beginning of the fourteenth century. And when Guelphs and Ghibellines had had enough of it, but a brief period of repose elapsed before intestine fights were again set on foot for an indefinite period, between two fresh factions, the Neri and Bianchi. A very turbulent cradle for art it seems; and yet, as in some other instances, a strong healthy art took root and grew up there, in the midst of all this civil brawl and jealousy, prepared to blossom when the sunshine came. Towards the latter part of the fourteenth century the battle-cry had changed, though the fighting went on all the same; and now the rivalry was between Aristocrats and Populars. Towards the end of the century the Populars had the upper hand; but, in spite of their name, out of them grew up a new aristocracy. Eminent men among them amassed money, became bankers, and acquired great influence by their wealth. But among these, in the first years of the fifteenth century, "we see one family, that of the Medici, assume by little and little an almost incredible influence over the masses, and Giovanni dei Bichi, who was their chief, was named Gonfaloniere. The rejoicing at this occasion among the people was so great, that some of the men most attached to popular government, seeing this enthusiasm, foresaw that the Florentine people were ready to give up their power into the hands of a master. From that day, if one wishes to write the history of Florence, it is sufficient to write the history of the Medici." Florence had, in fact, passed through the natural and often-repeated progress from popular government, if not to despotism, at least to aristocratic government; for there could hardly be more thorough aristocrats, in all the essentials of the character, its good and its evil, than the leading men of the Medici family, in spite of their commercial origin and profession.

We refer the reader to M. Yriarte's pages for the history of the family, given at considerable length and with the added interest of a number of portraits and other illustrations. Our interest is mainly with that member of the family who became so remarkable an influence in the patronage and promotion of Florentine art and culture in the greatest days of the Republic. It would probably be a mistake to regard the Medici as in any high moral sense patriots or benefactors. Their strength lay in the fact that, as our author observes, having acquired enormous wealth, they used it in so intelligent a manner that their success became, in the natural course of things, the benefit of those who surrounded them as well as of themselves. There can be little doubt that from the first they thoroughly enjoyed the possession of power, and studied their own aggrandisement, but they were wise enough to see that they could do this in no surer way than by linking themselves with the success of Florence and Florentine interests at large, and rendering themselves necessary to these ends. Lorenzo himself, who is, as every one knows, the culminating figure in this line of banking princes, was, in his private character essentially a selfish epicurean, though in a grand and superb manner, which gives him a dignity even when considered in that light only. But he had the power of passing at will from the character of *dilettante* and man of pleasure to that of statesman and ruler; and being a man of great natural talents and splendid culture, his very pleasure lay in turning his wealth to the promotion of everything that could tend to stimulate the artistic culture of the day in the brilliant state over which he was practically ruler. That he was a man much loved or very loveable may be doubted, were it only on the evidence of that countenance, as familiar to all students of artistic history as that of Michelangelo himself. It is the face of a shrewd, self-contained, cynical man, gifted with acute critical perception; and that he was renowned for his ironical and biting repartees is what his very profile almost tells us without words. He was the centre of a life of æstheticism compared with which the æstheticism which is playing its part in modern society is but a child's game. His amusements took the form of fêtes and shows, in which all the artistic genius of the day that was within reach was drawn together to furnish designs and scenic effects, and a mine of wealth was squandered on giving pomp and splendour to pageants of a day. It is necessary to bear in mind this element to realise the part he played in the daily life of Florence, and perhaps to understand the general popularity enjoyed by a character not such as generally makes a man a popular idol. He amused the people in a most magnificent fashion, and that in itself was enough to ensure popularity. Of his more serious patronage of artists there is no need to speak; but it is not always remembered by those who connect his name with Michelangelo and the other great artists whose rising genius he fostered and encouraged, that he showed the same energy and the same breadth of view in his encouragement of literature and his formation of the great library which still bears his name. The world of which he was the centre was not a world of high moral tone; indeed, it may be said that the moral element was almost conspicuous by its absence, and artistic greatness was practically regarded as the main end of life and as synonymous with virtue. This was the characteristic of the age, which displayed in fact a grand reaction against the ascetic ideal of the Mediæval period; and the typical man of the day naturally represents this purely æsthetic ideal of life emphatically. But there was never any example of the exercise of great sway and the realisation of a magnificent and sumptuous mode of life, carried out in so dignified and intellectual a spirit and with such entire freedom from vulgarity. Florence under Lorenzo represents the highest point to which the purely æsthetic theory of life has been carried in practice.

In another article (for we have only touched on a few leading points in M. Yriarte's able work) we will draw attention to some of the lights thrown by the author upon the architecture and other arts of the great period of Florence. In the present number * we are enabled to give two of the illustrations from the work, the view of the Pitti Palace and that of the chapel containing the tombs of some of the last of the Medici. Concerning this chapel and the tombs it contains, M. Yriarte makes a significant bit of criticism. Lorenzo had been commemorated by a tomb, far from gorgeous in its scale or its decorative effect, but to which the greatest Italian mind of the day had given some of his greatest thoughts in sculpture, and of which it may indeed be said without hyperbole, that,—

"Kings for such a tomb might wish to die."

But these later members of the family came in a day when the great lights of art were themselves quenched in the tomb, and their remains repose in a chapel rich indeed with mere decoration, but which, in comparison with Lorenzo's monument, only serves to remind us what a gewgaw is mere decorative detail when placed in competition with the thoughts in stone of a Michelangelo.

The Committee of the Cabmen's Shelter Fund have had an architect's competition for an improved cabmen's shelter design. There were thirty-five entries coming from all parts of the country. The committee have ultimately awarded the premium of 10*l.* to Messrs. Harvey & Clarke, of London; and one of these new shelters will shortly be placed at the York and Albany cab-stand, Regent's Park.

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* See pp. 488, 43

THE NEW EGYPTIAN ROOMS AT THE BRITISH MUSEUM.*

Resuming our notice of the new arrangements, cases 31-33 contain a collection of flint flakes, and, what is more interesting to the artist, a very fine collection of so-called spoons, and boxes used by the ancient Egyptians for holding different articles of the wardrobe, toilet, and kitchen. These are made of various convenient materials, as wood, reeds, palm-fibre, papyrus, and ivory. Many of these are of very beautiful make, and the artist of Egypt 3,000 years ago was as clever in adapting elegant devices and designs to the exigencies of his work as the German wood-carver and the Austrian toymaker is to-day. Animal forms of great beauty, human figures with slender limbs and a peculiarly-graceful proportion of purely native conception, plants, flowers, fish, serpents, deities, and many other natural or imaginary objects have been thus reproduced by the carver to form boxes, spoons or scoops, and ornamental receptacles for treasured objects. The next cases contain baskets of elaborate construction, toys, musical instruments, specimens of linen, and tools. The tools and utensils used in ancient Egypt consisted principally of wood and bronze; iron, as we have already said, being rarely found in the sepulchres. Hammers of stone have indeed been found near the mines of Wady Magarah, but no date can be yet assigned to them, and it has been conjectured, but without positive proof, that the Egyptians set flint flakes in handles, and used them as chisels and scrapers to carve calcareous stone, steatites, and other soft materials. A large variety of tools have, however, been recovered, but they are of a primitive and almost puerile form; such as bronze chisels, wooden mallets, bronze saws, adzes, drills, awls, and other such implements, of some of which the use is unknown. The plasterer used an adze, and spud or trowel to lay the plaster on clay walls toughened with straw, and covered his work with distemper or whitewash which was laid on with a coarse brush of palm-fibre. Wooden materials were covered with coarse cloths glued to them, and then treated to a heavy body of white colour laid on thickly and smoothed over. Upon this the paintings were executed. The invention of music has been ascribed, by many other nations as well as the Egyptians, to the gods. Here Thoth, the Hermes of the Nile, invents the lyre; Neith, the Minerva, invents the flute; and Bes, a kind of grotesque infant Hercules, clad in lion's hide, performs upon the trigon or triangular harp; while the sistrum or metallic rattle is the favourite accompaniment of Athor and Isis. The forms of musical instruments shown on tomb walls are various. They comprise the harp, carrying from four to as many as twenty-two strings (one tomb is known as Bruce's or the harper's tomb from the elaborate harps depicted in colours on the walls), lutes, lyres, guitars, drums, flutes, and double-flutes, trumpets, sistra, clanking chains, cymbals, and castanets. One of the stringed instruments in the British Museum is a wooden harp or guitar of peculiar shape, borne on the shoulder when played, and having four cords when perfect. It is covered with parchment, and has a bridge and a portion of one catgut-string remaining. This curious instrument comes from Thebes, a site fertile in the finest relics of ancient Egyptian art. Among the toys are several draughtsmen of interesting form, some inscribed with royal names; wooden and bronze dolls with jointed limbs; balls of white or scarlet leather stuffed with chaff, birds, crocodiles with moving legs, little models, and vases. The linen stuffs which are in this set of cases are entirely of flax, no cotton having been used, but woollen fabrics ornamented with embroidered patterns have been occasionally found in tombs. Some of these are fine, others coarse as canvas. The flax-stuffs were generally made in long narrow strips, and their uses were various, as dress, armour, mummy-shrouds, and coverings. The selvages of some have been found to be dyed with indigo, and old linen, when discoloured, appears to have been dyed red with the *carthamus tinctorius*. Bronze needles, threads, spindles, and reels have also been found. Among the specimens exhibited in this class is the linen shroud of a mummy, inscribed with the name of king Piankhi, a monarch of the twenty-fifth dynasty, which has been dated from B.C. 715 to 666.

The two upright cases between the windows in this room contain furniture, pillows or head-rests, chairs, and miscellaneous objects; and the cases in the middle of the floor-space are filled with a large collection of objects of attire and personal adornment,—wigs, dresses, glass, inscribed and painted tablets, inscribed and engraved stones, shoes, sandals, beads, necklaces, and pendants; bracelets, boxes for holding stibium and cosmetics, rings, inlaid tiles from Tel-el-Yahoudeh and other sites, blue porcelain articles, and the necessary paraphernalia which go so far to make up the conventional amenities of domestic life. In the drawers of some of these cases are stored up a number of papyri in continuation of those which have long been exhibited on the walls of the staircase leading to those rooms. The space at command on this occasion will not allow of a detailed description of these objects. The draughtsmen, however, deserve a passing mention. Among the ancient Egyptians there were two games played in some respects like the modern draughts or "fox-and-geese" games. They used a board divided into thirty squares, three one way by ten the other way, and another form which had twenty squares, twelve of which were arranged three one way and four the other, while from the middle of the smaller side eight squares stood out in a line. The two players had five or six pieces each, generally conical or sugar-loaf shaped; of the relative values and moves of the respective pieces little is known. There was also another game of "*robbers*" or "*latrunculi*," some men of the sets used in it being in the British Museum collection. Another game, of which little is recorded, is that called *han*, or the "*vase*," played with movable men upon a series of concentric lines marked on a circular board. One of the draughtsmen exhibited in this department is reputed to belong to the extremely remote period of the fourth dynasty, the beginning of which Mariette dates at B.C. 5004, Lepsius at B.C. 3892, and Wilkinson at B.C. 2700.

The papyri, apart from their manifest literary and historical value, are of considerable importance on account of the early forms of pictorial treatment which they enshrine. These very ancient relics of native African art are totally distinct from all other Oriental illuminations, and in some of their later peculiarities affected, and were affected by, the so-called Byzantine spirit that breathes more or less in all the earliest remains of human handiwork which is not pre-historic. We are told, in Birch and Jenner's Handbook to the Illuminations in the British Museum, that although some of the Egyptian illustrated papyri are as old as the fourth and fifth dynasties, written in the hieratic character, the use of vignettes or pictures does not appear to be earlier than the eighteenth dynasty, which existed from about fifteen to seventeen hundred years before our era. Then the figures are of moderate dimensions, traced in outline, the hair and other details black. At this early period colours were, however, freely used; blue for water, green for plants, yellow and red for details, and some vignettes were even gilded. Another style was to draw the outline only and leave the picture uncoloured. But so dominant was the principle of illumination at a remote period that the text of the papyrus is occasionally sacrificed to afford sufficient space for the insertion of the pictures. The colours were laid on in tempera; the black being an animal charcoal, the red an ochre, the blues and greens derived from copper, the white a fine chalk or gypsum. These were laid on flat or in monochrome, either without shading or with very faint and undefined attempts, and a strong black outline surrounds all the figure. These vignettes are not varnished. One of the most magnificently illuminated rituals of the nineteenth dynasty is that known as the "Clot-Bey" papyrus of Hu-Nefer, keeper of the oxen of king Seti I., considered to be the finest extant. The date of this is about B.C. 1200. After the nineteenth dynasty, which terminated in the thirteenth century B.C., comes the great historical papyrus of Rameses III., called the "Harris" papyrus in honour of its finder, the Egyptian traveller, which was published by Dr. Samuel Birch, under direction of the trustees of the British Museum in 1876; this is splendidly illuminated. It contains three large vignettes with figures of considerable size; the flesh of the monarch and of some of the figures is coloured white. After this period, although brilliant colouring is still employed, the drawings become faulty in proportion, and depart from the Egyptian canon of art. The practice of illumination in colours was continued to the twenty-sixth dynasty, but at that time outline was almost if not exclusively preferred, and some of the vignettes are drawn with a remarkable fineness and sureness of hand. Under the Roman rule, illuminations are found on papyri in which a scarlet or minium appears to take the place of the usual red ochre; light greens and pinks are extensively affected, but the later papyri of the Roman period are only illustrated by figures badly drawn in black outline. Besides the Clot-Bey and Harris papyri already mentioned, there are several fine ones in the Barker, Hay, Wilkinson, Sams, and Salt collections. That known as "Kelashar" is a magnificent hieratic of the Roman period with pink, green, red, and greenish yellow colours.

The second room is dedicated to the reliques of the dead. Cases 1-11 contain fragments of richly-gilded and ornamental mummy-cases and paraphernalia of the departed. Cases 12-21, a series of the finest mummy-coffins, set up erect, and now placed on revolving pivots, which enable the student to examine the elaborate ornamentation of all sides of the coffins. Above these, against the wall of the room, are a number of less pretentious, but not less ancient and interesting, coffins, constructed of thick slabs of wood of a dark colour, hewn and shaped with artistic care at a great labour considering the nature of the material and the poorness of the tools at command of the artificers. The middle of this room receives the mummies which formerly occupied a corresponding position in the old room. These were prepared with salt, bitumen, cedar oil, and other substances to resist decay, corruption, and the ravages of time. Notwithstanding this, the descent into a mummy pit has been described by those few who, like Harris, ventured down into the Cimmerian darkness and groped about among putrid remains rendered more hideous still by the confusion which the Arabs had made in vain search for treasures, as an appalling adventure. Harris himself was rewarded by finding a valuable papyrus in the clenched hand of its desiccated author, and another hidden in the semiliquid bitumen which filled the abdomen of another mummy. This preservative process was thought to enable the soul to return to its body after a course of transformations, which occupied from 3,000 to 10,000 years. Dr. Birch, in his description of the Egyptian collections, gives several details of the manner in which the preparation was effected. Silver gloves or finger-stalls were placed on the hand to preserve the position of the nails, and at the end of the process the body was wrapped in linen bandages, principally strips of 3 in. or 4 in. wide, several yards in length, laid on wet, remnants of old linen being frequently used for the purpose. As many as 700 yards are said to have been employed for a single mummy. Over this came a network of blue porcelain bugles, figures of sepulchral deities, scarabæi inscribed with mystical words and phrases, and a variety of emblems, of all of which the British Museum possesses in these rooms an immense collection. A very common mode of ornamenting the mummy was with a *cartonnage* composed of from twenty to forty layers of linen tightly pressed and glued together like pasteboard, then covered with stucco, and gilded. Of this, several examples are exhibited. Among the many instructive objects shown in these cases is the mummy of a little girl, in a coffin and bandages. The coffin consists of a flat board with vaulted cover, on which is the figure of a sacred snake. On the outer wrapper or shroud of the mummy is a painting of the deceased child, full-faced, wearing a wreath, a long white garment, and sandals. It is attributed to the Roman period. The peculiar tenderness with which the picture has been designed, the full, imploring eyes, the head leaning to one side, and the wistful expression of the countenance of the little child, attracts the attention at once in a forcible and affecting way. We can readily imagine the feelings of the parents of 2,000 years gone by who could find a solace under their loss in the contemplation of this relic. Near to this are the remains of the cedar coffin of Ra-men-ka, or Mycerinus, a king of the fourth dynasty (according to Mariette, B.C. 4235; Lepsius, B.C. 3122; and Wilkinson, B.C. 2450), found in an upper chamber of the third pyramid at Gizeh during excavations made by the late General Howard Vyse; the coffin of Enentef, a king of the eleventh dynasty (*i.e.* nearly 5,000 years ago), painted and gilded, from Thebes; and the mummy of a priestess, named

* See p. 441, *ante*.

Katb, in a sycamore coffin painted buff-colour. The mummy, which is still enwrapped in its proper bandages, has part of a *cartonnage* representing the face and features, gilded with a pale-coloured gold or electrum, alabaster earrings, and a collar of beads. The hands are of wood, crossed, with bracelets representing symbolic eyes in gold and tin. On the fingers are rings, and on the breast a pectoral plate of metal, with a scarabæus in form of the goddess Nut, and a sepulchral figure. The hair of this priestess, which was embalmed separately, is laid at the side of the head.

Passing over many important objects in these divisions, the next cases, Nos. 22-27, are devoted to the reception of mummies of animals; among them may be noticed cynocephalus apes, dogs, jackals, cats, kittens, bulls, rams, gazelles, hawks, ibises, snakes, eels, and fish. The animals employed and maintained by the sacerdotal class for the purposes of divination and veneration, and perhaps we may add of mystification, were especially subjects for mummification after death. Perhaps favourite household pets were also so distinguished. Next in order come the sepulchral tablets and boxes, followed by the large series of sepulchral figures of the Osirian or beatified dead, in cases 28-38. These figures, for the most part blue or pale lavender coloured porcelain, highly glazed, a few in ebony and other wood, copper, stone, and clay, are called "Shabti," or "Ushabti," that is "Respondents," or "coming when called." They commence with the reign of Amenophis III., a king of the eighteenth dynasty; they are in shape of a mummy, inscribed with an early text of the chapter or formula of ritual, not found on later figures. Later on, the sixth chapter of the Book of the Dead is found cut or inscribed upon them. After the time of the twenty-fifth dynasty (about 700 years before the Christian era), and during the twenty-sixth (which existed from B.C. 666 to 526), the figures take the shape of a small statuette, having the body mummied, the hands holding the hoe and pick-axe, and cord of the basket,—all emblems of Osiris by whom the deceased was justified and prefigured. They had also a small pedestal at the feet, and along the back an upright plinth or pilaster from neck to heel. The inscriptions record the name of the deceased person in whose tomb or coffin they were deposited, preceded by the term, "The luminous Osirian." An excellent account of these figures and an interpretation of the mystical chapter they carry on them may be read in the "Zeitschrift für Ægyptische Sprache," 1864, pp. 89, 103, and 1865, pp. 4-20. Several hundreds were frequently placed in one tomb, and as they then are of different fabrics, apparently made by different manufacturers, occasionally the space for the name of the dead person is left blank in the inscription.

Cases 39-44 contain a large series of sepulchral cones, and a set of wooden figures of the triple god, Ptah-Socharis-Osiris, the demiurgos of the kosmos, or universe. Some of these have hollowed interiors, adapted to hold parts of mummies, or rolls of papyri. Nos. 45-48 contain Græco-Egyptian and Roman antiquities from Egypt; and the concluding cases 45-48 sepulchral vases, chests, and miscellaneous antiquities found in tombs and sepulchres. The sepulchral tablets contribute much that is known about all branches of the Egyptian religion, history, and civil life, ranging from the ancestral worship which prevailed of the early dynasties to the later adoration of the deities of Hades. The types of deities are furnished by these tablets, and the sacrificial objects offered upon the tables show the things alone allowed to be presented to the divinities. In them, too, we see the modes of adoration, by standing or kneeling, the attitudes of subordinate members of the family, the titles enjoyed and the offices held by the deceased, their names, parentage, and social position; the feats of arms and personal prowess of individuals recorded herein, often render contributions to the somewhat scanty materials of history which have survived the wreck of ages. For in these two rooms, which we have hastily passed in review, we see stored up the remnant of a mighty race, in which for a time the whole of human progress was wrapped up. The destiny of the soul, and the condition of man in his future state, occupy, naturally enough, a large part of the representations of these tablets. The power of entering and quitting Hades, the accomplishment by the soul of its prescribed destiny, the welcome offered by the infernal deities to the liberated and purified spirit, are all shown here, and it is not until the late age of the Ptolemies, the decadence of pure Egyptian religion, that a dread condition is attributed to Hades, and a pessimistic view taken of the future condition of the soul.

As we look back to the remains of an age so remote as this which is displayed in these collections, the origin of modern civilisation can be traced in its primary development, and the germs of sciences which hurry us forward today can be found. "Philology," writes Dr. Birch, in a work about to be issued, "here can deal with a written language older than the remotest forms of Aryan speech; writing, with the first attempts to convert the elements of sound into a pictorial form. In arts and sciences the inventions of mechanical contrivances, tools, weapons, and the simpler machines, can be traced step by step. The loom, the plough, and press, are first seen at work. Painting, sculpture, and architecture appear in their earliest forms, while the arts of chemistry and mechanics evidently underlie them, as the principles of mathematics, abstract and mixed, are clearly involved in the eminence at which the productions arrived." The great length of antecedent time necessary for the experiences which lead to invention has also to be borne in mind as the discoveries had apparently to be made in Egypt itself, which, in its earliest period, does not appear to have received its civilisation from external sources, the arts of Asia being neither so old in point of time nor so excellent in regard to execution. Hence Egypt alone is the sole source from which all are derived, and in which the evidences of their derivation have most happily survived; and it is a paramount obligation with us to preserve with intelligent care, and to transmit without further dilapidation and deterioration to a posterity perhaps even more intellectual than ourselves, and therefore more keenly appreciative of the relics of human art-inception, these sacred heirlooms of the race of man upon the earth. Whether they will last for a length of time—the same as they have already survived under the exceptional circumstances from which they have been removed to those under which they are at present placed—is a matter of question. They have now to follow the vicissitudes of modern civilisation instead of the quiet peace of the underground tomb, or the safe hiding of the dry, warm, sand of their native land, and they have exchanged the clear air of Egypt for a humid climate adverse to the durability of the frailer materials of which they are in a great measure composed. Protected, then, by the very neglect they suffered,—unheeded and unsought for in the depths and corners of the darkling sepulchres,—they are now brought up into the outer world, and owe their preservation to the interest which attaches to them on account of their relation to the present state of historical research and philological science. But it will be a long time before we get beyond the lessons they impart, and the mysteries they still refuse to surrender.

WHAT SHOULD BE THE RELATIONS OF PAINTING AND SCULPTURE TO ARCHITECTURE?

On this subject the following paper, by Mr. H. Heathcote Statham, was read in the Art Department at the Social Science Congress:—

In endeavouring to suggest an answer to the above question, I have at least one advantage, viz., that I have not the slightest idea what those who proposed the question meant by it, or what direction they wished the consideration of the subject to take. Being thus entirely free to follow my own ideas in treating the subject, I may say at once that the question appears to me to be capable of consideration in three different lights. First, in regard to the definition and limitation of the profession of the architect; secondly, in regard to the place which painting and sculpture should take in the general architectural scheme of a building, and the degree in which they are or are not independent of the architecture; thirdly, in regard to the practical relations which should subsist between the architect on the one hand and the sculp or or the painter on the other, in the actual designing and carrying out of a building.

The first head, the definition of the profession of architect, is an important element in the discussion of the subject, for this reason, that it involves an answer to the question, whether the architect is to be regarded as directly responsible for the painted and sculptured decoration of the building; whether, in short, he is to be practically a painter and sculptor, or a designer of painting and sculpture; or whether he is to leave these adornments of the building to the hands of artists who have made a special study and profession of those branches of art. Upon this point there have been all kinds of contradictory opinions, architecture being at present not only the best-abused profession of the day (which is partly the fault of the architects and partly due to ignorance on the part of the public and of the leader-writers in the *Times*), but also the one about the nature and the duties of which the most vague ideas are entertained. According to one theory and practice, an architect is little more than a man of business, drawing plans, writing specifications, arranging the sale of house and land property, and conducting arbitrations. According to another view, he is an ethereal and all-gifted genius, having at his finger-ends every sort of artistic design, able to model sculpture and to furnish cartoons for frescoes, and equal to everything, except when sometimes his pure soul may be vexed by an awkward question about a drain. And between these two extremes is to be found every intermediate shade of idea as to the entity of an architect, most of them about as precise as that which was furnished to me one day by an engineer, of whom I asked in what he considered the difference lay between his practice and that of an architect, and who replied, "Oh, every one knows that; an architect is a man who draws houses and churches and things,"—the engineer, therefore, being, presumably, a man who "draws bridges and things." Yet there is really nothing vague in the matter at all. The province of the architect is capable of a perfectly simple and intelligible definition,—Architecture is the art of "building *with expression*," and the architect is the professor of that art. That includes all the practical and constructive part of building, as the basis, with the addition of picturesque effect or expression embodied in the arrangement of the plan of the building, the grouping and outline of the whole structure erected upon that plan, and, finally, the further expression given by the addition of ornamental detail and its characteristic design and treatment. When a man plans and builds a structure without any consideration at all for its appearance or expression, but only in regard to its practical utility, then he is purely an engineer; but, in fact, there ought not, rightly speaking, to be any essential distinction between architecture and engineering as far as buildings of any kind are concerned. A bridge ought to be as much a piece of architecture as a church, and is as much susceptible of architectural expression, and the distinction between an architect and an engineer should be regarded only as that between men occupied in different branches of the same profession, just as a Chancery barrister takes a different class of cases from a railway barrister, though both ranking in the same profession. As a matter of fact, a large proportion of the structures built by engineers are either destitute of architectural expression or are examples of architectural forms misapplied; but that fact does not affect the principle. Now, having defined the architect as a man concerned in building with expression, from the arrangement of the plan up to the ornamental detail, I should draw a line there and say that when you come to the addition of painting and sculpture a new form of art is introduced, and a new artist must be brought upon the scene. Architectural design and ornamental design (which is really the same class of art carried into minute details and emancipated to some extent from the trammels of construction) represent a form of art which does not directly imitate nature, and does not express definite ideas or raise definite emotions; it deals only with the general expression derived from order, repetition, symmetry, and balance of parts. Painting and sculpture do imitate nature, and do express definite ideas and excite definite emotions, and, therefore, belong to a different category among the arts, and require different genius, different studies and powers, from those which go to furnish the architectural artist. The idea that the same man may acquire and wield these various powers is quite futile, as all experience goes to show. There have been modern architects who have taken up the idea that they would design their own figure-sculpture for their churches and other buildings. I

should like to ask how much of the sculpture so designed would have had a chance of acceptance at the Royal Academy, where the standard of sculpture certainly is not extravagantly high? On the other hand, we have the case of such a man as Michelangelo, who is spoken of as an example of one who was painter, sculptor, and architect. He was a great genius, and in every way a most exceptional man; but the great architectural work usually credited to him is one of the worst-designed buildings in detail in the world; the dome was so badly constructed that it nearly came down again; and it is now proved by documentary evidence that all the good points in the general design of St. Peter's were due to Bramante, whose chief study was architecture, and whose design Michelangelo spoiled in carrying it out. Probably the only man in the history of art who had the faculty to be equally great as an architect and as a painter was Leonardo da Vinci, by whom there exist some architectural studies which look like the work of a man who had given his whole mind to architecture; but then Leonardo was the most exceptionally omniscient artist who ever lived. On the other hand, the idea which has been promulgated by Ruskin (whose architectural criticism is of an exceedingly *dilettante* character), that architecture is no art, and has no sufficient interest without sculpture and painting, need never be entertained by those who know how much matter for interest and study lies in the combination of practical construction and practical planning with architectural expression; how very much of art there is or should be even in the planning of a building; how very few modern buildings are artistically planned; and how large and varied is the field occupied by ornamental design as an art perfectly distinct from that of the sculptor and painter.

Having thus endeavoured to shew that the architect has quite enough to do without attempting to meddle with sculpture or painting, and that his own especial work, if properly and fully carried out, is sufficiently honourable and important in itself to rank as an art and to demand the best efforts even of men of exceptional ability, let us consider what is the relation which sculpture and painting should bear to architecture when brought into direct combination with it as contributing to the total effect, and whether these arts are fulfilling their highest function in contributing to heighten architectural effect, or whether, in their highest achievements, they demand to be considered separately, and for their own sake alone. To many critics, and some artists of the present day, the latter suggestion will seem absurd, and hardly worth consideration. There is at present a very general assumption, among people who write about art, that painting has lost much of its interest and life in the present day in part through the prevalence of easel pictures, and that if we only took to painting on the walls in fresco, there would at once be an immense revival of art. Why that should be I fail to see, and I have never found any one who could explain it satisfactorily. If there is a dearth of originality and power in modern painting, it is difficult to see how these qualities are to be developed by merely adopting a different medium of execution. The frescos executed by well-known painters on the walls of the Houses of Parliament are not superior in style or imaginative power to the oil-paintings by which they made their reputation. Sir Frederick Leighton's fresco at South Kensington is not his highest title to admiration. What would be gained by the general adoption of wall-painting as a decoration to our buildings is probably this, an increased demand for painting, and a consequently more extended scope for artists, and the opportunity of carrying out paintings on a larger scale than is usually practised in this country at present. But the idea that painting and sculpture necessarily gain by being connected with a scheme of architectural design, appears to me to be so far from the truth, that I would be disposed to say on the contrary that a work of the highest class, whether in painting or sculpture, demands an isolated position and undivided study; that it is rather lowered than raised by being made to play the part of an element in architectural decoration; and that painting and sculpture really cannot be brought into decorative combination with architecture unless they part with some of their own life, and are conventionalised so far as to harmonise with the severe and lifeless art of architecture.

If we take sculpture in particular, an art naturally more nearly allied to architecture than painting, we find that it is susceptible of almost every grade of conventionalism, down to a point at which it seems almost to blend into architecture. Egyptian art furnishes the most striking examples of this. In the avenues of sphinxes which formed the approach to their temples, figures all repeating the same fixed expressionless countenance, it would have been difficult to define whether the impression produced was architectural or sculptural. A single such figure would not have any particular interest or dignity except where colossal dimensions (as in the case of the sphinx *par excellence*) might impart these qualities; a long row of such objects is at once impressive, and hence we see that this form of sculpture is in reality to be regarded as a colossal architectural ornament. The caryatide figures introduced occasionally into Greek architecture are in some cases examples of a similar architectural use of sculpture in the repetition of somewhat conventional and expressionless figures, identical in treatment, and forming, in fact, not so much an ornament to, as an actual portion of, the architectural construction. And as long as sculpture is thus employed as a portion of the architecture, not as an arbitrary addition, it must be treated in this severe semi-mechanical style, or it will lose its unity with the architectural design, and appear to be crushed and overpowered by the architecture. In short, if you are to use sculptured figures as part of the architecture you must take the life out of them first, or they will protest against their usage. Even the celebrated figures in the porch of the Erechtheum are an instance of this; they would be models of architectural sculpture if they were placed in niches or otherwise framed in the architecture, but being made a part of the construction and carrying the roof on their heads, they always appear to me to be subjected to a menial office in the design which they are far too good for, and which in some degree degrades them. When we come to the question of sculpture which is framed in the architectural design, and not a part or an apparent part of the construction, the sculptor can have much more latitude. But even here, as long as his work is to be regarded as a part of the architectural design and to be considered in combination with it, it must be reduced to a certain conventionalism of character and repose of line, otherwise it will inevitably interfere with the repose and balance of the whole, and will assert its individual life too strongly. I will illustrate this by a reference to the front of Wells Cathedral, the most largely decorated with sculpture of all the English cathedrals. There are on this rich-looking architectural façade sculptures of two perfectly different types. The majority of the figures are large, above life size, and mostly formal and stiff in attitude and clad in full robes. Near the top of the façade, however, there runs across the building a series of niches filled by nude figures about half life size, in violent action, representing the Resurrection, the dead in the act of coming to life and rising from their tombs. They are different from any other sculpture in our Mediæval cathedrals, and were probably executed by foreign artists. Examined in detail they are very fine and pathetic, but are too high up to be seen properly from below, and, owing to their comparatively small scale, they have no effect on the general character of the façade, but might easily be passed over in a general survey. As sculpture, these figures, though much dilapidated, are superior to anything else on the façade; yet we may say, without a shadow of doubt, that if the figures which fill the greater part of the façade had been like these, had been figures in violent action and expressing violent emotion, the architectural effect of the whole would have been far inferior in dignity and grandeur to what it actually is. The figures would have disturbed everything and taken away all the repose which is essential to the highest architectural effect. The moral is, when you wish to use sculpture as an essential element in the total effect of a building, you do not require the most elaborated and life-like forms of sculpture; you must, so to speak, architecturalise the sculpture so as to make it harmonise with its position, and give a general expression and meaning to the building without too strongly obtruding its individual expression or character. When you do want to connect sculpture of the highest class with architectural effect, it is to be done not by making the sculpture part of the architecture, but by placing it in a commanding position in front of or in the midst of an architectural composition, which may serve as a worthy background to it, while the sculptural work stands out in the isolation which is required for its proper study and its full effect.

The question with regard to painting is less complicated than in the case of sculpture, because works in painting never can form, or appear to form, part of the architectural construction; they must always appear as decorative additions. But, with this exception, the same kind of conditions exist as in the case of sculpture and architecture. If the painting is to be what it is the fashion to call "monumental,"—to appear as an indestructible portion of the building, and closely allied with the architectural design, it must give up some of the realistic effect and emotional expression which belong to the painting that comes nearest to the representation of nature and of human life and character; it must avoid anything like scenic or perspective illusion, which would interfere with the solidity of the architectural effect, and it must represent figures and actions with that degree of conventionalism which will harmonise the picture with the repose of the architecture. The most highly-finished class of easel pictures painted in oil cannot thus be blended with architecture. Such pictures are in the nature of poems complete in themselves, with their own special life and interest, and which are, therefore, rightly treated as separate works to be framed off and studied each for its own individuality of interest. The only approach you can make towards assimilating such pictures with the architecture would be by spacing and dividing off the design of the walls into panels having a direct relation to the size of the pictures, so as to give to the room and the pictures the appearance of having been intended for each other,—an idea which it would be worth while to carry out when the object was to show some fine pictures in an effective manner; but in such an arrangement anything like an attempt to make the paintings seem part of the wall must be carefully avoided; they must appear as they are, separate objects. When the painting is executed on the wall and is to harmonise decoratively with the architecture, it will be found that, as with sculpture, exactly in proportion as you wish to make the painting a part of the architectural design, must you conventionalise it and throw it back from the plane of realism. In this respect there is no doubt that mosaic is the method which most completely combines with architecture; mosaic being in fact itself a kind of building on a minute scale, and having that solidity, hardness, and brilliancy of surface which gives it all the appearance of being part of the structure itself, and as durable as the building in which it is placed. Moreover, the brilliant effect of mosaic is peculiarly valuable where it is desired to have a richly-coloured interior decoration, as the picture in mosaic can then take its place as the strongest point, the high light in the decoration, to which everything else leads up; that being the position which decorative paintings always should occupy in a scheme of decoration; they should always be the culminating point. For this reason the less brilliant texture and usually lower tones of fresco render it less suitable for richly-decorated buildings; it comes in better where low tones of colour and a broad repose of effect are desired, and admits of more varied and realistic treatment than mosaic, though this licence must be carefully limited if the painting is to keep its place in the architectural scheme. The danger of approaching too nearly to purely pictorial treatment in such a case is illustrated in some of the frescoes in the Houses of Parliament, which are reproductions of oil paintings, and executed in as realistic a style as the material will admit of, producing an effect entirely at variance with the architectural framework in which they are placed. It may be observed, in connexion with this part of the subject, that Baron Triqueti's method of executing pictorial designs in inlaid marble had some peculiar advantages for architectural decoration, being capable of being executed almost in the same material as that in which the building was finished, and being, like mosaic, a picture architecturally built up and of indestructible materials; and it seems a pity that a better trial has not been given to this method of decorative painting, if so it may be called.

But whatever method may be employed in carrying out decorative sculpture and painting

in a building, two things are absolutely essential; first, that the subjects should be suitably chosen, and the paintings or sculptures should form a completely arranged series with a distinct point and meaning in the parts and the whole; and secondly, that the architecture should be, and should manifestly appear to be, specially designed for that particular series of painting or sculpture, and not built at haphazard to be turned over to the painter or sculptor to do what he can with it. And this brings us to the third point, what should be the relation of the architect to the painter and sculptor in actually carrying out the building. And here I would reinstate the architect. I proposed before to cut him off from any pretension to be a painter or sculptor; but I would place him as the directing mind of the whole scheme. It would be his province not only to plan and design the building, but to consider beforehand what decorative painting or sculpture he would have introduced in it, what ideas they should illustrate, what method or style of work should be selected, and then to provide for this in the architectural scheme, so that the whole should appear as one idea intended from the first, and deliberately carried out step by step. In such a case the architect may expect to have, and should have, some control over the work of the sculptor and painter; should be consulted by them, and should have at least a power of *veto* against any design which he considers opposed to the general effect aimed at in his building, and to the result which he planned from the first. It is only, however, where the architect has given this deliberate thought to the whole scheme that he can claim the right to control the painter and sculptor. If he has merely left a space for a painting here, and a niche for a statue there, without any consideration as to the subject or even as to the effective lighting of the work when *in situ*, the painter and sculptor may reasonably say, "You did not think of us, and we are not bound to think of you." That is not the way to produce a great and complete artistic result, but it is the way the thing generally is done; partly, because the architects will not take the trouble to think and plan out the whole scheme beforehand; partly because, if they were willing to do so, not one in a hundred of their employers would allow them the necessary time; the object usually being not to get as perfect a building as possible, but to get it finished at the earliest possible date.

This is what appears to me to be the truth in regard to the relation of sculpture and painting to architecture; and the practical deduction from such a conclusion would be this,—That those who are concerned in the erection of large buildings, especially public buildings, would do well to endeavour to combine decorative sculpture and painting with the architecture in order to increase the interest of the building in detail, and the richness and variety of the total effect; that to do this successfully requires that the whole scheme of the architecture and the decorative art should be considered and worked out as a whole by one directing mind, who should be the architect; and that to do this well necessitates much more time and deliberate thought than is at present generally bestowed or allowed for in such cases. That the more general employment of sculpture and one or another form of pictorial design in connexion with architecture would add much to the interest of our buildings, would afford many more opportunities than now exist to sculptors and painters, and would be likely to promote public taste for and interest in art by familiarising the popular mind with artistic design; but that it is a fallacy to expect that such a course would necessarily create or foster a higher standard of artistic genius in sculpture and painting, and that, on the contrary, the very highest works of genius in those arts must stand alone and on their own merits, and cannot be bent into subservience to an architectural scheme. The dilemma is similar to that in which the art of music is placed by the new school of lyric drama founded by Wagner. In that school the attempt has been made, with a great degree of success in some instances, to make the musical composition progress hand in hand with the dramatic action at every step; but this is done at the cost of curtailing and breaking up the development of the musical ideas in order to reduce them to obedience to the details of the dramatic action and story; the total effect is more logical, but the music is, in itself, much less interesting, and is almost unmeaning apart from the drama. Similarly, if we wish to bend painting and sculpture into decorative arts, forming part of an architectural whole, we can only do so by reducing their emotional expression and conventionalising their style and execution so as to fit them for their proper place in the general scheme of design, and thereby producing art which, like Wagner's music, will contribute to a logical whole, but will be of inferior interest apart from that connexion. To suppose, therefore, that such a system would lead to a quickening of artistic genius and invention in these arts seems to me to be a groundless, if not an absurd, expectation, and seems equivalent to saying, "The greatest artists of the cinquecento period painted in fresco on the walls of buildings; let us also paint in fresco on the walls, and we shall be sure to become great artists." The fact is that the reasons for the artistic greatness of one age and the artistic weakness of another lie much deeper than this; that they are, in fact, quite beyond analysis. Artistic inspiration and genius, like the wind, bloweth where it listeth, and we cannot say whence it cometh or whither it goeth. It is glowing and spontaneous in one age; it is cramped, stunted, and tentative in another. We may be conscious of and lament its decay, but we can really do no more; it is not at the beck and call of any theory, however complete and logical.

ARCHITECTURAL EDUCATION.

UNIVERSITY COLLEGE, LONDON.

The following is the opening lecture of the courses in Architecture and Construction at University College for 1881-82, delivered by Professor T. Roger Smith, on Monday evening last:—

It seems to me fitting that on this occasion, which forms the commencement of my duties as Professor of Architecture in this College, I should devote the opening lecture to an account of the course of instruction given in the architectural classes entrusted to me. In doing so I shall state what has hitherto been done, and what I purpose to attempt, in my conduct of the classes, I shall offer a few suggestions to students to show how they may best profit by the advantages which this college places within their reach; and I shall point out in what parts of their professional education the courses here given will assist them, and in what they must rely upon other opportunities. This has been announced as a public introductory lecture, in the hope that, at a time when the professional attainments of architects are about to become the subject of special examinations, what is here said may, perhaps, travel a little beyond the walls of this class-room, and so may help to draw public attention to the fact that University College has taken in the past, and is prepared to take in the future, her full share in the education of those who are intending to exercise the profession of architects. Before passing on to the consideration of the work to be done in the future, the past history of these classes, and the names associated with them, claim our attention. You probably all know that this is not a course of instruction now to be begun, but one which has been carried on for many years, and round which not a few associations have gathered. No small part of my responsibility to-day is due to the distinguished bearing, ability, and success of the professors whom I have the honour to succeed in this chair.

Professor Donaldson, happily still living to enjoy an honoured retirement, is the father of the profession of architects in England. As the founder of the Institute, and in a hundred other ways, he has conferred benefits of the greatest importance upon architects as a body. As the first Professor of Architecture in this College, he has been most helpful to very many living architects of eminence, who have studied under him here. I had myself the great advantage of attending Professor Donaldson's lectures as a student, and I am glad to take this opportunity of saying how largely I feel indebted to him. The vast stores of his learning were poured out before his classes ungrudgingly. The kindness of his manner made us all feel at home with him; and the unfeigned interest which he took in our progress was the very thing to rouse and stimulate our own love of our work. We all know something of the researches in Greece, and the studies in Italy, which will identify the name of Donaldson with the pursuit of Classic architecture as long as the literature of that architecture continues to exist, and, partly on that account, but far more in consequence of his personal qualities, Professor Donaldson was respected, beloved, and valued by us all, as no man ever can be whose attainments and whose character are not both of the highest kind. He established a comprehensive course of instruction in the art and in the science of architecture, and what he so started remains in the main the rule of study here to this day. I should not like to pass without mention the vast labour undergone by him in providing diagrams to illustrate his lectures, and the high artistic merit of the greater part of those diagrams. As specimens of architectural drawing and tinting, these sheets (the chief of them being the work of his own hands) were calculated to exercise the best possible influence on the students. They placed before us good examples drawn in a singularly artistic manner. Nor did the Professor's services to his pupils stop at placing illustrations before us. With rare liberality he put them into our very hands, lending them to us for private study at our own homes. There is much more which I should like to say were this the proper occasion, but I will only add (what is, perhaps, the highest tribute that I can offer) that there were few of the students in Donaldson's classes who did not at the close of the session feel that they had not only attended a learned Professor, but had made a valued friend.

When Professor Donaldson retired, his duties devolved upon my immediate predecessor, Professor Hayter Lewis. I cannot speak of his work from the same stand-point which my memory of student days affords me in regard to Professor Donaldson; yet, having had the honour to be long associated with him in work elsewhere, and more recently to act as his substitute here, I feel that I am, perhaps, as competent as any one not his pupil can possibly be to appreciate at their true value Professor Hayter Lewis's services in this chair. Public-spirited, like his predecessor, Professor Hayter Lewis has been a signal benefactor to the body of architects at large; and the establisment of voluntary examinations open to students of architecture was only one, though probably the most important, of the measures which he has been instrumental in forwarding. In this college he has laboured assiduously and with signal success, bringing to the work a wide store of learning, a singularly accurate, orderly, well-regulated method of procedure, and the attainments of a highly-cultured artist, student, scholar, and traveller. He has largely added to the already ample series of illustrations which, by the kindness of Professor Donaldson, have been allowed to be used, and he has most liberally permitted his drawings also to remain here for your benefit. It is a matter for sincere regret that Professor Lewis should have felt it necessary to retire from a post the duties of which, had his health permitted, he might have discharged for many years with the greatest possible advantage to students of architecture and to this college.

I cannot but feel how serious is the responsibility cast upon me in succeeding to men of such powers and such attainments, and I can only say that I will do my very best to keep near the high standard reached hitherto in the work of these classes. I should be the first to admit that I am in many respects unequal to my predecessors; yet I ought fairly to add that unless I had felt that I could in some degree do justice to the post I would not have sought it or accepted it. As far as I know my own powers and attainments, I will so shape the course of study here that students shall have the best which it is in my power to give, and so far as I feel my own proper line to differ from that natural to those who have gone before me, to that extent and no further, do I propose to modify the method or system of teaching which I shall pursue. As to the subject-matter of the lectures, that in the main must continue what it was under my predecessors; but with the addition, as a permanent branch of the subject, of the course of lectures on Professional Practice, which, with the concurrence of Professor Lewis, I introduced as an experiment two sessions ago; for the attendance upon these has fully justified my belief that the subject was one on which lectures would be felt to be acceptable. The classes, I need hardly say, are intended especially for young men who are being educated for the profession of architects, and they have been and will be carried on with a view to being made as useful as possible to students of this description. The courses, in whole or in

part, have, however, been found useful by persons who are preparing for or following kindred pursuits, as civil engineers, surveyors, builders, and others. The classes are in no case intended to supersede the training obtained by being articled or apprenticed, but they will aid the pupil, partly by enabling him to make a better use than he otherwise could of the opportunities presented to him by his pupilage, and partly by giving him information and rousing in him trains of thought which would not easily reach him in the routine of an architect's office.

It appears to me very unlikely that pupilage will ever cease to be desirable. I once, I confess, thought differently, and imagined that some well-arranged system of class teaching might in time come to supersede it; but I am becoming convinced that nothing but practice can well teach so very practical an art as that of the architect. But even in the offices which afford the most favourable opportunities, the pupil will be unable to learn all that he ought to acquire; and this deficiency must in some way be made up, or the young architect will be but inadequately equipped for his work. It is here that classes such as those which open this week come in most advantageously. They provide instruction such as the office in no instance can furnish. It is, moreover, not only the subjects taught, but the manner of teaching, which renders a class a valuable auxiliary, especially to a beginner. This consideration is too often overlooked, but it is one well worth attention. The instruction given in class is of the same kind as that to which the young student has been indebted for almost all that he has learned in school or college. He is used to it, and he knows, or ought to know, how to learn from it.

When a young man passes from a condition of life in which all his subjects of study have been taught him by qualified and appointed instructors, in which his time has been divided up for him into definite lectures, and in which his work is daily examined and his progress tested, and takes up the position of a junior in an office, who has to learn what he can, as best he may, from such share of the office work as his superior is able to entrust to his hands, the change is a great wrench. To some natures, of course, the altered circumstances act as a stimulus, and the new pupil begins rapidly to acquire knowledge; but this does not always,—or, in my opinion, often,—occur. It is seldom, I fear, the case that much good is done till some months more or less have been spent; and unhappily it sometimes occurs that the youth does not find his feet for years, if at all, and that invaluable time is lost. If for no other reason, it would be worth while for pupils to attend some kind of class, so as to keep up the old habit of study; and when a very arduous profession, requiring a great deal of technical information, has to be mastered, it is better that such class should be one which will contribute towards this end if possible, than one not bearing immediately upon professional training.

To put the matter shortly, the pupil best sees and learns practice in the office where he is articled. He will best learn the principles which underlie that practice in some such college as this.

But it may be felt and urged that there are other ways of supplementing the practical training acquired in the office; and that it is not necessary to attend classes in order to acquire theoretical and historical information about architecture. Construction is no new science; architecture is not an art of modern creation, and many excellent standard books are accessible. The money payable as college fees would go far to procure a fair library of works of reference, and the time spent over the classes would suffice to master the contents of the volumes. I do not deny that this is so, and that the student able and willing to read, especially if he can read French, German, and Italian with facility, has access to the instruction of teachers far more profound in their knowledge of their various subjects than I can ever hope to become; and yet there can be little doubt that, especially in London, with its many amusements and many claims upon time, there is a poor chance of that steady, regular attention being given to a course of reading which is required to render it thoroughly useful. Many students, especially in the country, have only the resource of reading to supplement their office-work, and well it is for them that books, and good ones, are accessible; but I have no kind of hesitation in saying that a year's attendance at classes will fix in the mind far more information than a year's reading. There is an impressiveness about the living voice which is wanting to print and paper; there is a stimulus in the presence and rivalry of class mates; the regular recurrence of the lecture evenings is of great advantage in securing that some time each week shall be devoted to study; there is, in short, at a college more inducement to close attention and careful note-taking than under the ordinary circumstances of study from books without an instructor; and the illustrations which the liberality of the past Professors have placed at your disposal, and those which I may be able to furnish, together with the specimens of materials, are of more value than most book illustrations. To those, then, who are fairly able to attend, I can, therefore, honestly recommend the direct personal teaching given in this classroom and at King's College, and the combination of teaching and mutual instruction so successfully carried on by the members of the Architectural Association, as calculated to aid their progress very materially.

In many classes in this and every other college, the subjects of instruction are chosen and arranged so as to prepare the student for passing a certain examination. The subjects for the first B.A. and the second B.A., and the B.Sc. examinations, are provided for, and the examinations alluded to in various parts of the college programmes. This college, it is true, is not an establishment intended for preparing young men for examinations; but it must not be forgotten that both the examinations and the programmes of the classes have been carefully arranged to provide what experience seems to point out as necessary to a thorough education, special or general. More than this, there are now so many walks in life to which the passing an examination of some sort, or a whole series of them, forms the entrance, that it would be wrong were the subjects taught in the classes here not to a large extent made to correspond with the subjects required for examinations.

For the first time we now have an examination established which every architect who intends to take a position such as membership of the Institute confers, must pass; and though I do not wish these classes to be considered as being henceforth devoted solely, or even chiefly, to preparing pupils for that examination, as conducted by the Institute of Architects, it would be idle to ignore what has taken place, the more so that I myself have given up a large amount of time and trouble to the organisation of the examination, and through many years past to the promotion of the voluntary examination which preceded it.

I shall have shortly an opportunity of discussing the subject in a paper to be read before the Architectural Association, so I will not enlarge upon it here. I must, however, point out that the programme of the examination issued by the Institute may be taken as embodying the minimum of attainment and skill which, in the opinion of the council of that body, and of a large committee of men of experience who advised the council, should be possessed by every architect at the outset of his professional career. It will consequently, I think, be useful to examine this programme, and to point out how much of its requirements can be supplied by information to be learned here, and how much is left to be obtained from the practical education which you must gain in the office, on the scaffold, from your sketching-tours, and in your own studies. The obligatory preliminary work consists of a set of plans with a perspective drawing, a sheet of details, and an ornament. This is, of course, intended to elicit practical skill in architecture generally and in handling drawing materials and making drawings. That skill must, of course, be gained elsewhere, but I hope that the work would be indirectly benefited by what is learned here. Work done as a student, such, for example, as sketches from the diagrams, notes, or essays, may be also submitted, at the option of a candidate. The first subject for examination is the history of architecture, taking a general view of a wide field, and an examination in some detail of a single division of the subject. Our Art course of lectures here supplies the information needed for this paper, and arrangements (which I shall explain presently) will be made in order to enable the students to bestow special attention on one special subject each year, so as to correspond more exactly with the course of examination. The second subject of examination is one intended to show that the student has mastered some one style sufficiently to give him a command over its forms and features, so that he could use it on a building without committing gross errors. This subject is largely a test of practice and drawing and private study, but the classes will materially assist the student in his preparation for this paper, especially if he select the special subject of study alluded to above. The third subject is materials, construction, and sanitary science; and our Construction course covers the whole of these subjects as indicated in the Institute programme. I need hardly add, I hope, that practical as well as theoretical acquaintance with these subjects will be necessary in order to satisfy practical examiners, and must be sought on the works to which the student has access. The fourth subject of examination is planning; and here practice will be of more use than teaching. I do, however, propose to deal with planning, as far as it can be usefully considered in the class-room, in my Professional Practice course. The fifth subject,—specifications and estimates,—is one which is constantly kept in view in the construction course, but on which direct instruction is given in the practice course. Here, again, practice elsewhere must be relied on to supplement the class-room work. Finally, professional practice to a limited extent forms the sixth and last subject of the programme. This is fully dealt with in the course devoted to the subject. From this hasty view it will be seen that as much as the class-room can contribute to the student's preparation for passing this examination will be provided in our course of study here.

Another examination, that to be passed by candidates for the post of district surveyor, has recently been remodelled and rendered more searching than before. Here, again, practice and theory will both be tested; but most of the subjects which are likely to be touched upon form part of our construction course, in which materials, construction, and ruinous structures are all dealt with; and of our practice course, which includes lectures on the Building Act.

I need only, I think, add that the examinations at the close of these courses, with possibly some intermediate examination, will afford the students a means of estimating their chances of success in these more important examinations, and good practice in answering questions on these subjects.

You shall now hear exactly what is done and is to be done in the classes. They include three courses, denoted A, B, and C, and treating respectively of art, science, and professional work.

The art-class,—Class A,—approaches architecture as a fine art from the side of history, and necessarily so. You can hardly in any other way understand the subject. The design of every great group of buildings,—nay, to a greater or less extent, of every single building of importance,—was largely influenced by the design of buildings previously existing, and, in its turn, exercised an influence on what was built afterwards. An English church, for example, is planned in the manner familiar to you all, with a nave and aisles, mainly in consequence of that arrangement having been in use near the Christian era in Rome for courts of justice. In short, there is little about a building that cannot be better understood by knowing its history than in any other way, and there is much which is quite unintelligible without such knowledge. Course A, as given by my learned predecessors, has embraced that series of architectural styles which stand in some sort of relationship to the architecture of modern Europe. That is to say, the ancient architecture of Egypt, Assyria, Persia, Greece, Etruria, and Rome, and architecture since the Christian era,—of the styles known as Basilican, Byzantine, Romanesque, Saracenic, Gothic, and Renaissance. This is an immense field. It certainly shuts out the vast and extremely interesting architecture of India and Japan, but with this exception it leaves very little of interest unnoticed. Professor Donaldson used, I think, to bestow most of his attention on the Classic styles of the ancient world,—the field where his laurels as an investigator and a discoverer were won. Professor Hayter Lewis, if I mistake not, leant more in the direction of Early Christian and Saracenic art,—subjects to the study of which he has devoted much time abroad as well as at home. Possibly my own inclinations, and my studies on the Continent, may induce me to devote a rather larger proportion of attention to

Renaissance work; but I shall endeavour to follow my predecessors in giving fair and honest attention, so far as time will permit, to each part of the field in turn.

It is, of course, not possible, in dealing with so large a subject, to treat much of it in great detail, but though a comprehensive view is sufficient for the ordinary purposes of the student, I am convinced that he ought to be taught some one style more thoroughly, partly with a view of putting him in the way of studying other styles for himself with equal thoroughness, and partly also in order to prepare such students as intend to offer themselves for examination at the Institute. I propose accordingly, as an experiment, to expand one portion of the course, and treat one subject at greater length, or at least in more minute detail, than the rest, endeavouring to pursue it far enough to make the class somewhat familiar with the mouldings, ornaments, and more minute details of the style, as well as with the general architectural forms and the leading features of the buildings.*

DECREASE IN THE VALUE OF CITY OFFICE PROPERTY.

The great extent to which the erection of commercial buildings and offices has for some time past been carried on in the City appears to have had a prejudicial effect on the annual value of this class of property. At the late half-yearly meeting of the shareholders in the City Offices Company, the Chairman, Sir Thomas Dakin, said they had lost several valuable tenancies, and though they saw their way to re-let the premises, the competition had been of such a nature through the many new buildings which had been erected in the neighbourhood, that they had been obliged in several cases to re-let the vacated offices at a smaller rent than they received before. They had, however, acted on the principle of keeping their offices filled as far as possible, but in times like the present to let them uniformly for short periods. The unlet portion of their property had been reduced from 6,575*l.* on the 31st of December last, to 4,362*l.* at the close of the half-year, and therefore they had made a very substantial increase in the letting of their property. The Chairman added that an important incident of the half-year had been the taking of their Tower-street property by the Metropolitan and District Railway Companies for the completion of the Inner Circle line. The property stood in their books at 35,785*l.*, and they would obtain 35,552*l.* for it. The rental of the property was from 1,500*l.* to 1,550*l.* a year, and the terms upon which the companies had purchased it were twenty years' purchase on the net rental, and 10 per cent. for the compulsory sale.

LIGHTING UP THE ST. GOTTHARD TUNNEL.

The mode of lighting the St. Gotthard Tunnel has been the theme of much discussion, and, naturally, the electric light finds most favour. Two systems have been proposed as practicable. According to one plan, the compressed air-pipes are to supply the motive power for producing the electric light. About forty lights, each of 1,200 candle-power would be sufficient to light the tunnel. The other scheme advocates the employment of movable lights. For this purpose specially-constructed locomotives could be used, which are to take in at each end of the tunnel a sufficient supply of compressed air to pull the train through it and furnish the motive power for two electro-motors. The light produced by them is thrown by reflectors both in front and rear of the train, and thus completely and efficiently light up that portion of the tunnel through which the train is proceeding.

Stone for Truro Cathedral.—The general committee have resolved that Carnsew (Cornish) granite should be used for the plain ashlar work of the outer walls; "Box ground" Bath stone for the outside "dressed" work, or, in the discretion of the architect, "Doulting"; that the bulk of the interior plain work should be of St. Stephen's (Cornish) granite, and the interior dressed work of Bath or other stone, at the discretion of the architect.

* To be continued.

THE NEW UNIVERSITY COLLEGE BUILDINGS, NOTTINGHAM.

The University College Buildings, Nottingham, have been erected from the designs and under the superintendence of Messrs. W. & R. Mawson, of Bradford, architects, and were opened, as our readers will recollect, in June last, by Prince Leopold, when we gave particulars of the foundation.* The buildings occupy an excellent position in a central part of the town of Nottingham, and the site is enclosed by wide open streets, viz., South Sherwood-street, Bilbie-street, and Shakspeare-street.

The principal front of the building is towards Shakspeare-street, and is 260 ft. in length and 60 ft. in height. The style of the building is Gothic, and all the parts, both in the exterior, interior, and the fittings throughout, are designed in harmony with each other.

The general outline of the front is composed of the principal entrance gable in the centre, projecting considerably from the general line, and of which we give a view, and terminated at each end by gables, also projecting. These three gables have massive pinnacles at their angles rising from the ground-line. The façade between the centre and the two end gables is divided into two-light windows, with shafts in the jambs, and with shafted mullions.

The upper floor is formed with a continuous arcade of single-light windows, with piers between, formed of double coupled columns. The ranges of windows on the ground and first floors are broken in the centre by handsome projecting bay-windows of different treatment, with square heads at the top filled in with tracery. These bay-windows are carried the whole height of the building, and their lofty roofs are carried into the main roof. Between the bays and the wings are placed four richly-treated dormer windows.

The central entrance gable is the principal feature in the front, and is divided on the ground-floor into three pointed open archways, with clustered columns and well-carved capitals. On the first-floor level, over the three archways, are three windows which light the main entrance-hall, filled with geometrical tracery, with shafts to the jambs and mullions. The upper part of the central gable is covered with diaper work, and divided by a broad band of sculpture, representing a school of students of the arts and sciences; there are also three large medallions, in high relief, of music, sculpture, and painting. In each of the three gables of the principal front are placed two statues, 7 ft. 6 in. high, on pedestals with canopies over: Shakspeare, Milton, Bacon, Newton, Watt, and Cuvier. These statues, which are very creditably modelled, and executed in the same stone as the building, add very greatly to the character of the front, and are the work of Messrs. Farmer & Brindley, of Westminster.

In the centre, at the junction of the principal gable and the side roofs, is placed a *flèche* of wood, covered with lead, rising to a height of 120 ft.

The façades towards Bilbie-street and South Sherwood-street are treated in a similar manner to the principal front, and designed to group with it, and to form a picturesque outline.

The building throughout is executed in Ancaster stone of a bright, warm colour. The heads of the windows generally, and the whole of the larger windows in the principal gables, and opening into the staircases, are filled with stained glass. The roofs are lofty, covered with Westmoreland slates in bands, and terminated with a handsome ridge cresting in wrought iron. The principal fronts, between the gables, are finished with a pierced parapet in stone. The chimneys are in cut stonework, with projecting and recessed sides, with moulded bosses and cornices.

The large open space all round the buildings, laid with grass and planted with trees, allows the varied outline of the principal fronts to be well seen.

The interior of the building is very simple in its arrangement, but very convenient; each division of the building is separated, and yet communicates with the other. We publish plans of the principal floors. Generally, the front towards Shakspeare-street is devoted to the main entrance and staircases, with class-rooms on each side, and corridors lighted by two open quadrangles. Behind the principal entrance are placed three theatres for chemical, physical, and general lectures, the two former having laboratories, workrooms, and professors' rooms attached. These rooms are all arranged and fitted with the best and newest improvements, and no study has been spared to render them as complete, in every respect, as those most experienced in the working of them could suggest.

On the left of the principal front, facing South Sherwood-street, are the rooms of the Public Free Library; on the ground-floor is the entrance vestibule and staircase opening into the news-room and central reading-room, 90 ft. in length, with an average width of 45 ft. On the first-floor are the reading-room and reference library, the same size, lighted from the roof, and also from the sides, with a reading-room for ladies. A committee-room and students' reading-room are provided on the ground-floor.

On the right of the principal front, facing Bilbie-street, are placed the Vertebrate and Invertebrate Museums, with separate entrance, vestibule, and staircase,—the former on the ground-floor and the latter on the first floor, lighted from the roof, and each 90 ft. in length and 45 ft. in average width, with large projecting bays in the centre, which give variety to these fine rooms, and add to their convenience. The rooms in the basement are devoted to the unpacking of books and arrangement of them, under the free library wing, and to workrooms for the preparation of specimens under the museums, communicating with lifts with the rooms above.

All the fittings and furniture throughout the building are in American walnut.

The entire cost of the whole works, including furniture, fittings, and decoration, is about 70,000*l.*

The workmanship throughout has been carried out under the careful supervision of Mr. Richard Bates, the clerk of the works.

* Vol. xl., p. 786.

NEW OFFICES, WEST GEORGE-STREET, GLASGOW.

We give a view of some handsome office buildings, recently completed in Glasgow, for Mr. James Aiken, from the designs of Mr. John McLeod, of that city, architect. They are situated at the corner of West George-street and Wellington-street, having a frontage to the former street of 39 ft. and of 111 ft. to the latter. There is a considerable slope in Wellington-street, allowing shops with cellars to be introduced at the lower end. Mr. Aiken's firm (Burns, Aiken, & Co.) occupy the whole of the principal floor, entering from West George-street. Their accommodation consists of a general office 40 ft. by 28 ft., three large private rooms for the partners, one smaller room, safes, &c. They have also a large strong room on the basement, 40 ft. by 34 ft., fitted up with iron racks for deed-chests.

From West George-street access is obtained to the upper floors, which are all occupied as offices,—the whole of the first and part of the upper floor by the British India Steam Navigation Company and Messrs. McKinnon & Company. The offices are all provided with safes, lavatories, &c.

The basement and principal floors are fire-proof, being formed with rolled iron joists and concrete.

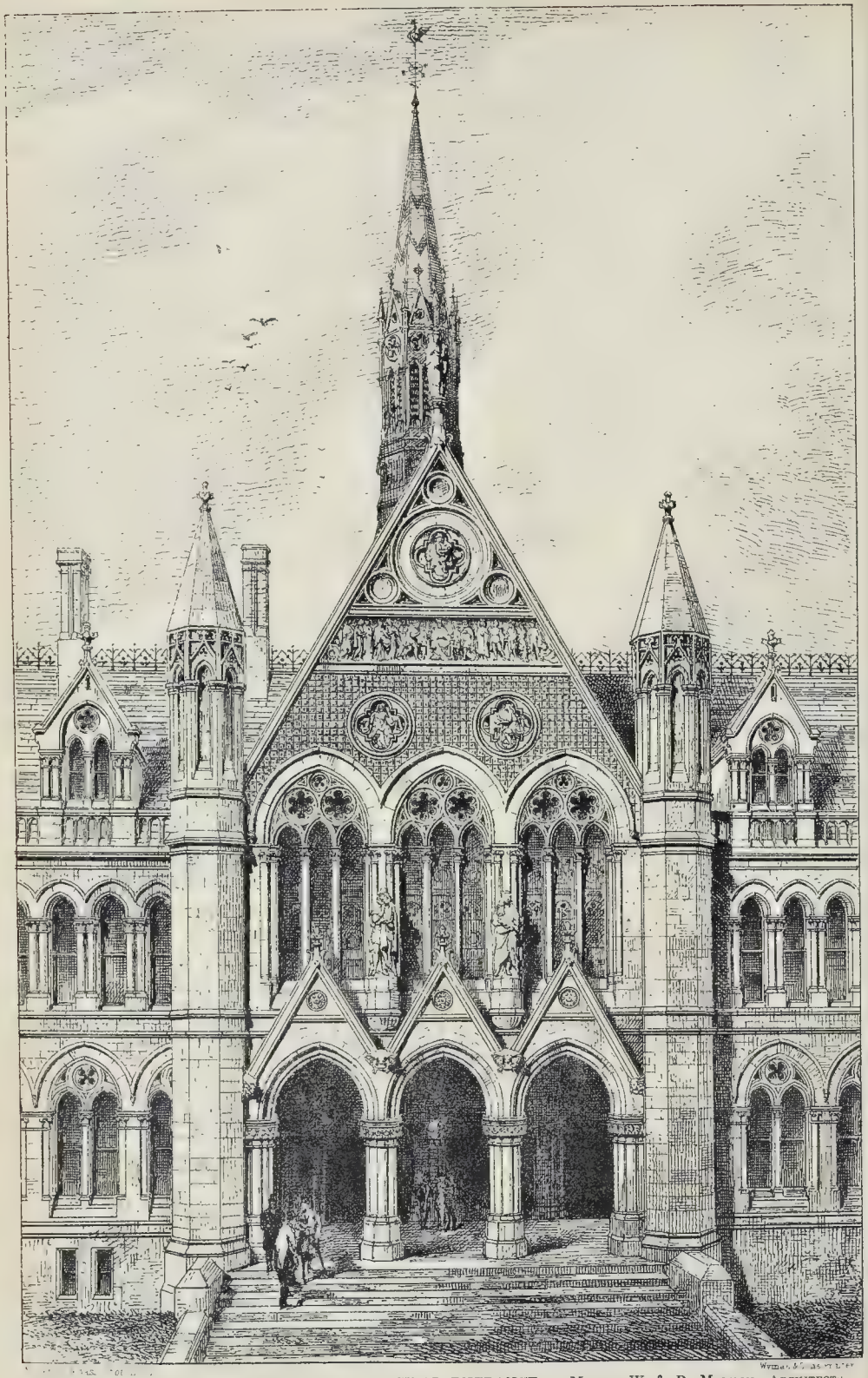
The lobbies and landings are laid with imitation marble tiles, and the walls of staircase, safes, and lavatories are lined with white glazed tiles.

The building is of white freestone from Overwood Quarries.

The principal contractors were,—for mason's work, Messrs. George Barlas & Co.; wright's work, Mr. James Connell; and for marbles and tiles, Messrs. Galbraith & Winton.

The work has cost about 11,000*l.*, exclusive of site.

Conflagrations.—"R. T." writes:—In early youth I remember, on asking a blacksmith why he threw water on his fire, he informed me it was to make it burn up strong. Our fire-extinguishers still do it, leaving off when the building is gutted out; they are prejudiced against chemicals. I wonder if they would try a block of soda submerged near the intake-pipe. This gradually dissolving the water would be strongly impregnated with tungstate that kills fire. Our friends east of Temple Bar are just now very warm on the subject; innovations do upset vested interests; perhaps, even they may take kindly to the above suggestion.



UNIVERSITY COLLEGE, NOTTINGHAM: PRINCIPAL ENTRANCE.—Messrs. W. & R. Mawson, Architects.



New Offices West George S

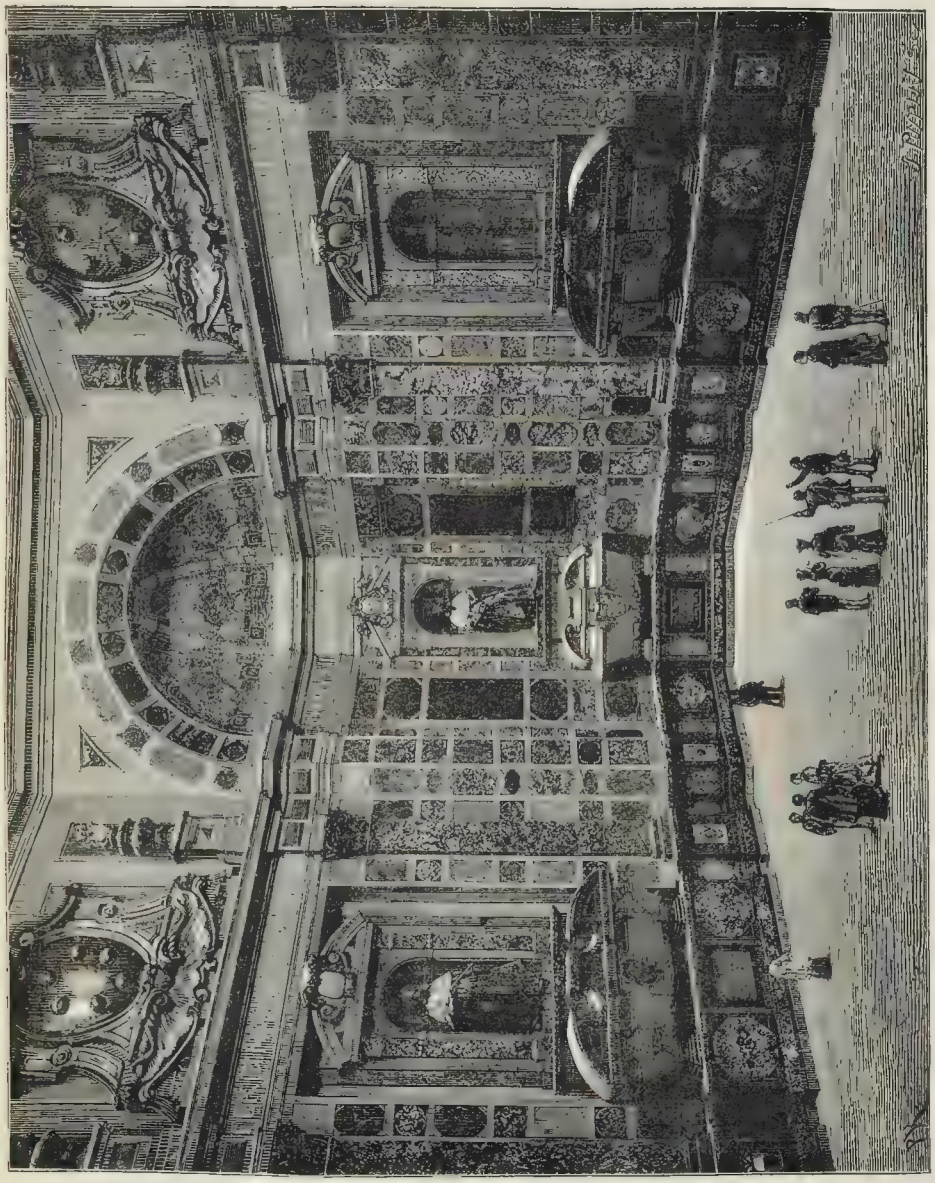
John McLeod



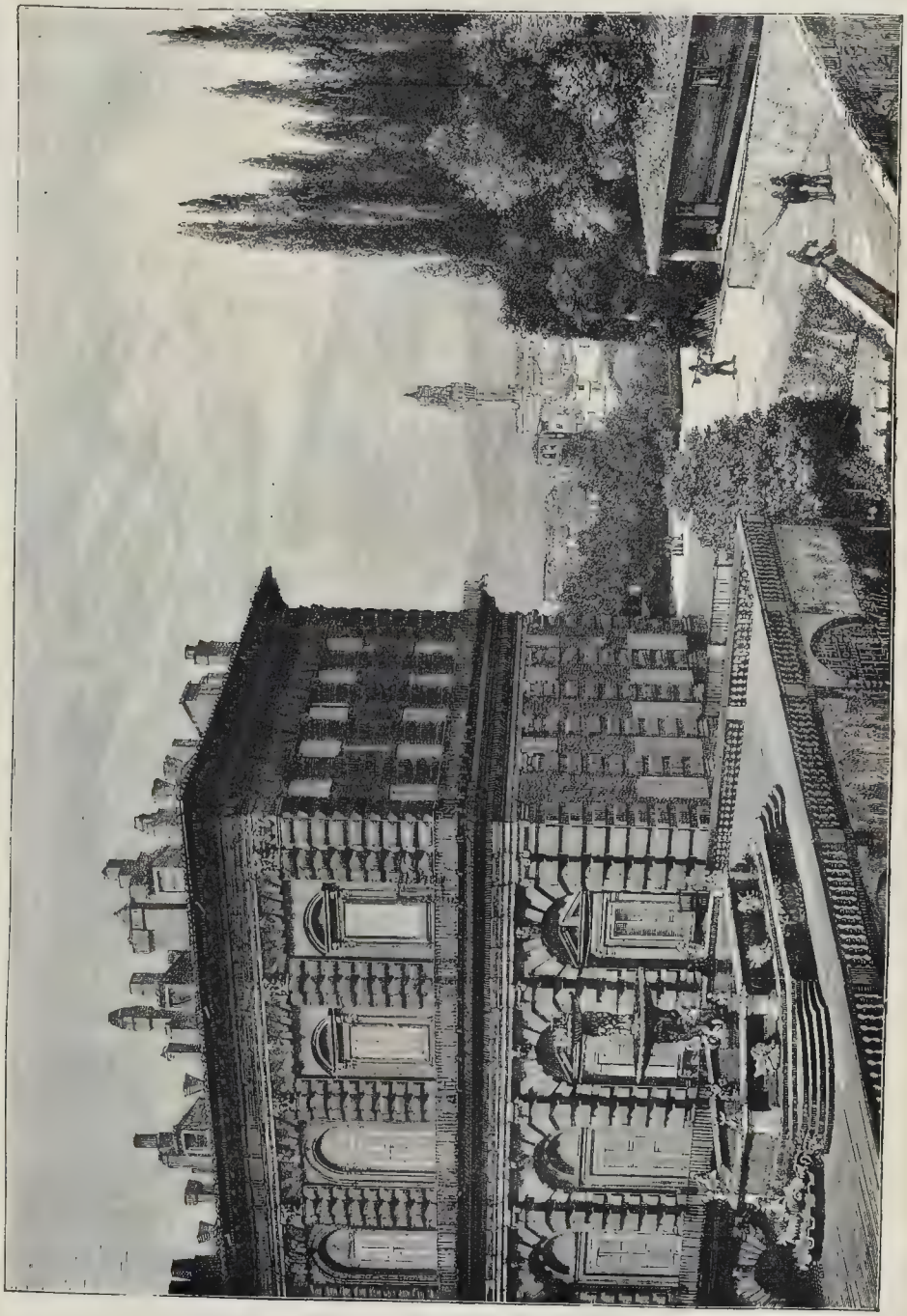
Wyman & Sons Printers 9 Queen St

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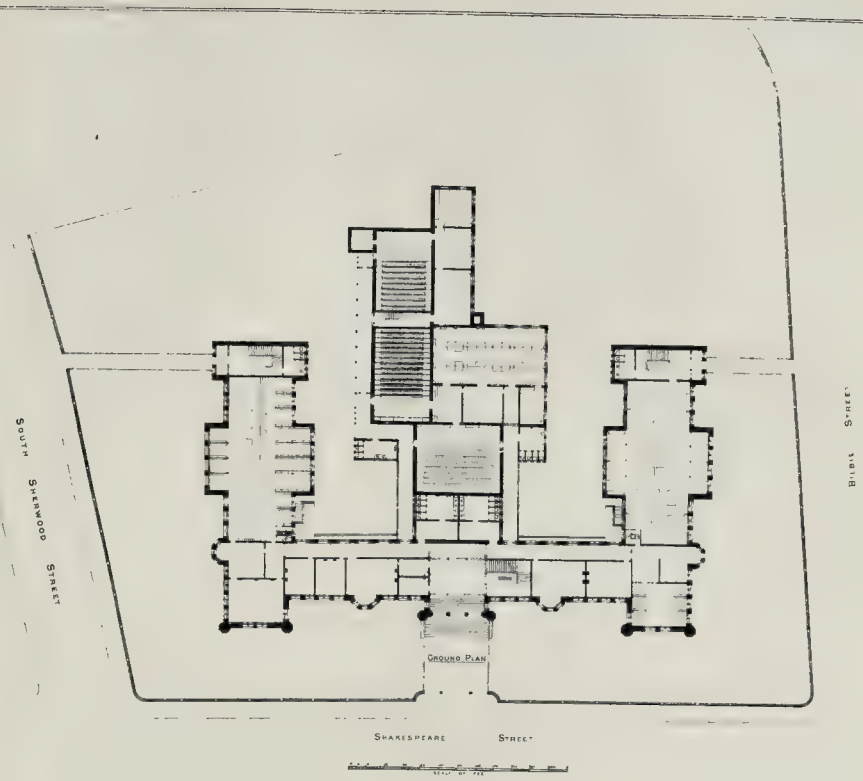


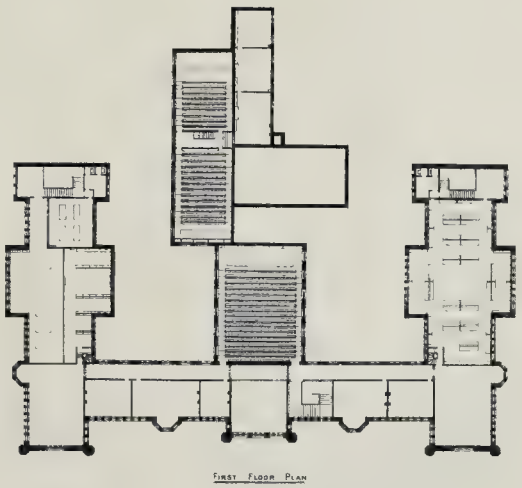
CHAPEL OF THE MEDICI, SAN LORENZO, FLORENCE.—TOMBS OF THE LAST OF THE MEDICI. [See p. 475, ante.



THE PITTI PALACE, FLORENCE: FROM THE GARDEN SIDE.

[See p. 475, *ante*.





Whiteman & Bass, *Photo-Lithos* 236 High Holborn

W. & P. Manson, Architects, Bradford.

Wyman & Sons, Printers, G^t Queen S^t

UNIVERSITY COLLEGE, NOTTINGHAM.——*Plans.*

PAINTING AND SCULPTURE AS AIDS TO RELIGION.

At the Church Congress in Newcastle, on the 6th inst., Mr. T. Gambier Parry read the following paper:—Like many other things, Fine Art is a power for good and evil; and its attractiveness makes that power great. For evil, we find it in works of vanity and vice; for good, we see it in the fire which shines from beneath the surface of good men's works. Will and genius are the sources of its power, and thus a work of marble or of colours becomes a thing of purpose and of life; yes, and a more true and clear exponent than language of men's nature and men's thoughts, for language may hide and pervert truth, but Art would convict itself in the lie it would try to tell. The impulse of art comes the artist knows not whence. An irresistible and untraceable ideal haunts him; its imagery falls on him like a reflection from another state of being; the mystery of it engages him; the beauty of it fascinates him; its power increases in his search to realise it; heart and mind are oppressed at the sense of it; and the poetry of art alone affords the means of its expression. A work of art comes forth because it must. Its purpose is its own relief. All fine arts have a common origin, and are necessary to each other. The arts of the painter and the sculptor belong to the architect, and enhance the beauty of his work; but music does so even more perfectly; for, with all that sculpture may adorn it or painting enrich it, architecture is never so grandly beautiful as when the divine strains of music are echoing from its forms. Music translates these forms into a perfect eloquence, and clothes them with the colours of her own beauty. How easy, then, to understand the endearment of art to mankind! Thoughts pure and beautiful flash across him, and are the next instant gone, like a sunray in the sky or a fragrance from the earth. The thoughts had left but a vague shadow of their image, but art rescued it and made it a reality. That first rude sculptor may well have started back who first saw the embodiment of the soul's conception, Whence that conception? An invisible, inscrutable breath had impinged upon his thought, as the light air wafts across his forehead; whence it came and whither it went he knew not. There it stands before him a reality —terrible in its reality; an embodied shadow; an emanation from his own life; a film of thought that had flashed out from the unknown, and was the next moment lost; gone like the gloss upon the dew, but caught up, recovered, reproduced by his rude skill. How inevitable was idolatry! Whence was the birth of that rude image? Was it an agony of grief, or the dread of death, or of conscience that had struck upon his imagination? He looked blindly into infinity, conscious of a light he could not see. The terror of the unseen had forced upon him the idea of deity. He felt the divine element in things, and called them gods. As with that rude sculptor, so in all time, art is both the creature and the producer of emotion; and most natural, therefore, is the result that the subject which produces the deepest emotions produces also the greatest art. Its moral and religious influence is indubitable; but unlike the effects of eloquence in literature and speech, art is most powerful by its indirect appeals. I doubt the moral value of its direct representations of pain or shame or evil. Its influence for good and noble action is by the fascination of its works which make those actions beautiful. Its illustrations of agony and vice are themselves as repulsive as the evil they wish to cure. I doubt therefore Hogarth's pictures of the Rake's Progress having ever stopped the course of a rake, or Morland's illustrations of the fall and ruin of Letitia having ever stayed the folly of a frivolous girl. But there can be no doubt of the power of art to clench a conviction already received, or to add force equally to superstition and to truth. The arts of all time have illustrated this, from the idol of the savage (the embodiment of the demon of his dread), to all that the arts of Assyria and Egypt, Greece and Rome, have done, or the lavished ornament of the temple of the Jews, the paintings of the catacombs, the frescoes of the Middle Ages: all testify to this use and power. The embodiment of the religious ideal,—and deeper far than that, the impersonation of that ideal,—has been a longing desire of mankind approaching to a necessity. The irresistible conviction of spiritual existence, the idea of the power and beauty of invisible beings, has so possessed the minds and imaginations of men that the whole material universe has been peopled with them, from the gods who reigned in the starry heavens to those bright and graceful beings with which mythology has filled the woods and fountains, the rocks, the ocean, and the very air itself. Impersonation was the ideal on which the Pagan arts had been perfected. They swayed the emotions of men. But yet with all their beauty, and with all their power, an impenetrable shadow hung over them. Satisfaction was incomplete. The impersonation was inanimate. The life of it, indeed, was in the artist's mind, and its beauty was in the eyes of those who looked on it. Human sense had grasped at what the human spirit had yearned to see. The material of an inanimate symbol was given to it. Intellect and sense alone were satisfied. The heart, the mainspring of humanity, was not touched. A great ideal in philosophy, in literature, and in art had for ages occupied the mind and imagination of mankind. But whence its power, if it were but a thing of fancy or a dream? The whole fabric of it had long since perished but for the conviction of its own inward truth. That conviction was the forecast of a great reality. All art had strained its eyes towards it; the loftiest music of all poetry had raised its voice to it; and, far beyond the reach of all these, suffering humanity had lifted its blind eyes, and stretched out its hands to it; and it was this,—the hearts of all nations had yearned for the impersonation of life. At length, and in the fulness of time, that life was manifested, and that life was the light of men, and the human heart was satisfied. The Christian artist is like "the sower that went forth to sow." Art is truly a divine seed, whose fruit is for the sweetness of man's life. But human infirmity mars it, and human failing blights it; till, well watered by human tears, men reap in joy. Art is sent with a divine message to the world, and that message is the evidence of the universe to the perfection of its Creator as exhibited in the mystery of beauty. This is the commission that the artist bears,—to translate to the world the symbols of God's universal love. The divine attributes of power and infinity might overwhelm the world with fear, but the attribute of love reassures it. Beauty is the symbol of that love. Reason cannot define nor imagination fathom it; and he that bears the commission of that message can do no more than, by the simple eloquence of truth, to win the sympathies of men, and to train them as he has trained himself to see in the lineaments of beauty not the mere fancy of a fascinated sense, but a power overlying, underlying, pervading all things,—the mystery of beauty; not a mere quality of material, but an element of life; not a mere accident in physical nature, but a designed purpose of its existence. But here we are met by the Word of Wisdom which must be true, that "No man by searching can find out God." To answer or to explain this impediment we need but little of our own unaided wisdom to reply that "The philosopher cannot be found out by searching among the atoms of his body, nor the life and instinct of an animal by the keenest anatomy." An unwise man does not well consider this, and a fool will not understand it. But the Word of Wisdom is perfect, and has dispelled all difficulty and discouragement by answering thus:—"The spirit searches the deep things of God;" and it further adds, "We have received the spirit which is of God that we might know the things that are freely given to us of God, because they are spiritually discerned." Great powers of insight have been given to us, but they fail to reach that spiritual ideal, except on fixed conditions. The senses, reason, imagination, conscience, are the main elements of human perception; but each one is subject to those conditions. No one function of that great machinery can arrogate its own sufficiency when its gaze is turned to things divine. Imagination is indeed that faculty by which the soul ascends to the contemplation of the Divine nature, but for its health it needs the balance of the rest. So sense and reason alone must fail to reach it. They may suffice to treat of the phenomena of mind and matter; but they make a sorry and a crippled machine to trust the course and conduct of human life. The cold and narrow creed that some schools of thought and philosophy would thrust upon the world exacts a far more difficult acceptance than the wide and simple Gospel of God. The immortal soul is self-conscious. It is conscious, too, of universal life, and of its own place in it. It has been offered that Gospel of Death, and has refused it. It is satisfied with the knowledge of the fact of mystery, as that without which eternity would be an idle void. It listens to the echoes of a distant past. It has never let go the hand of God. It sees and hears His guiding spirit in the trial-sphere of human life. It knows His footsteps; it traces His light. All nature is His parable. But nature is the universe, a wide subject, and a large word to use. Nature has many meanings to men's minds. Nature is God's home and ours. How lovely is she! And yet men wrangle over her. Pride and faith would fight over her; but, thank God, how near does the love of her bring together the philosopher, the Christian, and the poet, heal all the wounds of prejudice and mistrust, turn all their enmity and contempt to brotherhood, and blend their rivalry in her adoring admiration! All subjects take their colour from men's minds. Things present themselves, and men's minds represent them. But then those things have passed through a great machine, through the sieve of an instant, analysing sense,—through stream and counter-stream of reason and imagination,—and they come out, like the hope of the human soul, unchanged, indeed, in individuality, but transformed, transfigured. So the influence of fine art upon thought and life depends greatly upon the tenor of the individual disposition, for some minds turn all poetry to prose, and some invest the simplest things with the halo of their own brightness. *Nihil ictigit quod non ornavit.* The spirit of universal life in nature points to immortality. Fine art embodies it, and translates its lovely parables to the world. She is the bearer of the lamp of that life to all who have eyes to see the divine beauty in her imagery and ears to hear the divine wisdom in her voice. But some are cold, some deaf and blind; and she casts her pearls before them in vain, for no art can draw music from the chord that Nature has not already tuned. If science and morality have their sermons in stones, religion has hers in forms of beauty. But, alas! it is not unreasonable to fear that the influence of fine art with the multitude goes no deeper than the eyes, and their value of it is rather for its furniture than its poetry. Regard plainly for one moment the effect of a great picture and sculpture gallery upon the multitude. What do they find? A vast array of pictures and statues; portraits and landscapes of all nationalities; here and there a scenic representation of a religious subject from one school, or an academic composition from another; then, more rarely, indeed, a gem of devotional expression; the rest are boats or battles, or domestic scenes most picturesque, or vice and revelry most offensive; and the sightseers disperse, delighted with their entertainment, exhilarated by its brightness, and confounded by its multiplicity. But pause one moment more. There were some who went lingering away; for there were those among that multitude, and possibly among the poorest and the meanest in the world's esteem,—men, women, and perhaps children too, on whom some lovely ray of thought had struck; and the aspirations of devotional expression, still breathing from the surface of some old canvas, as the poor artist had left them, with his last sigh, a legacy for the world, had found their kindred spirit and had struck home at last. These were they who possessed the chord that nature had already tuned. The music was in the lyre, and mute only till the musician's touch awakened it. But you have asked a serious question: "How can religious life and thought be affected by art?" I can only venture to reply thus:—Fine art is profoundly more a thing of spirit than of sense. To a soul penetrated with the love of God all things minister. To such a one, whether practically an artist or not, but at least contemplatively one, whose powers of natural insight have been cultivated and refined by all that it is art's sacred mission to teach,—to such a one nature has opened wide her great treasury of Divine life. She has spread before the eyes of his responsive spirit, in a vista of infinity, the mystery of Divine beauty. Unsolved, unsolvable! He gazes with adoration. The highest faculties of his nature,—of body, soul, and spirit,—in silence bow before it. Sense perceives, imagination portrays, reason accepts, conscience assures, with all the power of their blended testimony, that that inscrutable mystery of beauty is the mode in which it has pleased the blessed God to communicate to His creatures the perfection of His wisdom and His love. The sublime vision is beyond the range of mortal sight. The moral sense, the voice of the soul

within, has answered "Yes"; and the heart turns to its course in human life, the sphere of a short pilgrimage, fortified and content. The convictions which thought, study, and the experience of life had heaped together, stored, sorted, and purified in the great laboratory of memory, have been illuminated by a ray from the throne of immortality. Fear vanishes. Difficulties which tempt, infirmities which impede, are but the discipline of an existence conscious of its own infancy. The way of life lies out before. The light of Divine beauty has been shed upon it; and thus along the pathway of this mortal life, whether it be earthward or heavenward, the footsteps of the travellers are made light, and their hearts rejoiced with the blessings of assurance and of peace.

ART ABROAD.

Viscount Powerscourt, K.P., commenced his address, as President of the Art Section of the Dublin Congress, by some observations upon the Dutch school, and reviewed in succession the works of other of the principal Continental schools. He remarked that there were great and distinct schools of art in the capitals of the various states which now form the German Empire, and the many fine collections of works of the old masters in the cities of Germany exercised an influence on art-education all over the country which, with different local characteristics, made the race one of the most remarkable for the cultivation of artistic genius. Few people who visited the principal capitals were aware that there were in the Cassel Gallery something like thirty works of Rembrandt, including several landscapes by that great master, which were so very rare. He did not suppose that in all the collections of England altogether more than half a dozen landscapes by Rembrandt could be found. His lordship remarked, with regard to the subject of picture-cleaning, that it was a practice more honoured in the breach than in the observance, and when done required the greatest care and judgment. Very few understood it, and more pictures were destroyed by the practice than could be told. He had often been horrified by the irreparable damage done to pictures, because all the fine and delicate glazings put on by the artist were removed in the process of cleaning, and although the picture often looked wonderfully renovated, for a short time afterwards, by bright new varnish, the experienced eye would see at once a hardness and crudity in the colour denoting that the more delicate parts of the work had for ever disappeared. With reference to the French school, Lord Powerscourt pointed out that in France, under whatever rule happened to be in existence, art was systematically nursed and fostered, and made familiar to the people in a way which he did not think obtained, at least to the same extent anywhere else. In France there was, as part of the Government, the Ministry of Fine Arts, and although no doubt we had in England also our Science and Art Department, as a branch of Government, there were certain ways in which art was more directly encouraged in France than in any other country, including our own. There was a certainty, under conditions of merit, that a French artist must have proper recognition of his talents, and that not depending, as in this country, upon individual appreciation of any particular style or branch, but in the widest sense on a system of substantial reward by the State of the highest merit in painting and sculpture, of whatever kind, method, or even material it might consist. That was, in sculpture,—whether it were a figure or group in marble, bronze, terra cotta, or anything else,—if it only came up to the required standard; and, in the same way, in painting,—let it be an historical work, a study of the nude figure, or of animals, or still life,—the Government dealt with it, and gave the greatest spur to the efforts of the artist which could be, by not only distributing prizes, but by purchasing the finest works that were exhibited, and adding them to the national collections. This was, no doubt, done in England too, but it was mainly confined to the works of deceased artists, which there might, perhaps, be good reasons for, although they did not on this plan receive the stamp of national approval in their lifetimes in the way they did on the other side of the Channel. In France, whether there was a monarchy, an empire, or a republic, there was the Ministry of the Arts, and the united wisdom of the Council chose, independently of any consideration except merit, the works to which they awarded the palm in the annual exhibition. The prizes were always awarded, and if there was not sufficiently conspicuous merit, it did not at all follow that any picture must be purchased for the nation, so that the proceedings of the jury were kept pure, which would not be the case if they were always to purchase. In France, the effect of art upon the social life of the people is, continued Lord Powerscourt, much more apparent than in England. In this country you hardly ever hear among the artisan classes any remark bearing in any way upon their appreciation of anything of the kind; but in Paris it is quite remarkable how many of them there seem to be who know and feel a good deal about it. This is due to a great extent to the much greater freedom of access to public collections which there is there, as well as in other Continental countries, than here, and especially to the fact of the national museums as well as the *Salon* being freely open to the humblest on holidays, and especially on Sundays. It is really most interesting to see the Louvre or the Palace of Versailles on such occasions, crowded with *ouvriers* with their wives and families, examining with attention and intelligent interest the grand works of the old masters, or the contemporary paintings in the *Salon* or the Luxembourg. These days are certainly rather to be avoided by those who have leisure at other times, for the galleries are generally so full that it is impossible to obtain more than a glimpse of the pictures over the people's shoulders. All that access to the great works and examples of art must, and it is evident does, have a civilising and refining effect, which I hope we shall see carried out in a somewhat more liberal spirit soon in England. I have the strongest opinion that it must be better to make it possible for those who must perforce spend their whole week in some close warehouse or factory, perhaps amid the whirr of machinery or the monotonous employments to which so many must necessarily be condemned, to go into the spacious galleries such as exist in London and elsewhere, on these the only days when it is impossible for them to do so, and feast their eyes on the glowing canvases which are there displayed. There is the idea that it would entail a certain amount of extra Sunday work upon the officials and *employés* in the museums; but on the Continent they are generally not opened till after the hour of Divine service, and the officials have their Monday for rest, when the galleries are generally closed. We have tried this plan here in Dublin at the National Gallery, and the arrangement is found to work well. With regard to English art, his lordship said the work of the best British artists stands as high as any in the world, and in domesticity, and in touching and noble sentiment, it is probably unsurpassed; but there is very little, if any, of the system of the best painters having schools and pupils of their own, which was the case in Italy, Spain, Holland, or other countries in the great days, and is still the practice in France, Belgium, and elsewhere at the present time.

"WHAT IS THE INFLUENCE OF THE ANNUAL EXHIBITIONS OF CONTEMPORARY PICTURES AND SCULPTURE ON ART AND PUBLIC TASTE?"

In the Art Department of the Social Science Congress, Dublin,

Sir Thomas A. Jones, President of the Royal Hibernian Academy, read a paper on this subject, in which he said,—The field opened up by this inquiry is one of vast extent, and presents no small difficulties to an unprejudiced investigator. Until our civilisation is sufficiently advanced to admit art in the adornment of our churches, and our national and municipal buildings, we cannot hope to find a fitting field for the exercise of those higher powers of conception and execution which assuredly exist among us, and only require encouragement for their full development. The Corporation of Manchester is setting a noble example in this respect, which, it is hoped, other public bodies will imitate, but the success of which it would be premature to discuss. And here the utility of our annual exhibitions of contemporary art becomes apparent, as they afford the only means by which our artists can come as it were face to face with their public, and influence with that public might be possible if, regardless of past failures, they dared to oppose their insular prejudices, and by working for art, and art only, they aimed at turning the tide of our national tendencies. Did they even adopt a lower standard and, like the French artists of the day, struggle through years of labour and privation in the pursuit of fame, content to deny themselves the luxuries and even comforts of life if the laurels of the *Salon* eventually crown their brows, then, indeed, British art might occupy a nobler position among the nations. Unfortunately, our artists, with few exceptions, seem neither actuated by love of art nor desire for fame. Their object is to gain as much money as they can in the shortest time possible. Consequently they will not afford themselves time to thoroughly master the technique of any art in their eagerness to "make it pay," and having no higher aim they manufacture art such as it is, and that modern creation, the dealer, goes the round of their studios, and, like the buyers for commercial houses, selects the wares best suited to the taste of his customers. Brilliant exceptions there doubtless are, and some great artists among us labour to interest, and, at the same time elevate, the public taste; but the manufacturer carries the day, and even were the forms of ancient Greece linked with the colour of Veronese presented to our public, they would waken little sympathy among the masses who throng our exhibition galleries. So it comes that our figure-painters and sculptors are driven to the representation of familiar subjects, and it must be confessed their compositions, though sometimes puerile and conceited, are unstained by the grossness and vulgarity of the Dutch school of Teniers and Ostade, and often they invest them with pathos and intellectual interest. If, however, they stoop to adapt their creations to the public standard, there can be no doubt they have their reward, for in the annals of art, past or present, the enormous sums received by living British artists are unparalleled, and the present day may well be styled the golden age of art in England. Annual exhibitions, however, if they fail to influence the taste of the day, undoubtedly tend to increase it. Could the statistics of the last ten years be procured, and we could compare the number of exhibitions, the numbers attending them, and the amount of sales effected, there exists little doubt that 1881 would be found far in advance of 1871, and on such data it might reasonably be presumed that there must be a great increase in the number of individuals taking an interest in art, and necessarily possessing what we call taste. Instead of being confined to the capitals and a few leading cities, annual art exhibitions are now instituted in many provincial towns, and even in Dublin, within the last few years, two societies, the Irish Fine Art and the Dublin Amateurs, give annual exhibitions in addition to that of the Royal Hibernian Academy, and we are promised another Art Association, a distinctive feature in whose programme will be an annual loan collection of works of high artistic standard. Any attempt to disparage the talents of our living artists is here most emphatically disclaimed. Had they the support of either the State or that of public bodies and corporations, they would doubtless be able to meet, and fit themselves for, the requirements of the more exalted styles of art. Failing this support they must only adapt themselves to the prevailing taste of their public, and as landscape-painting comes within the range of its intellectual capacity, the landscape-painting of the present day is, consequently, far in advance of all previous efforts in both refinement of feeling and truth, and, it is presumed, will form the distinctive characteristic of nineteenth-century art in the estimation of the critics of future civilisations. On our public taste lies the blame of any shortcomings in our art; for, though with lavish hand it patronises what affords it satisfaction, no Minister would be allowed to hold office who proposed to allocate a portion of the funds for the decoration of our public buildings. South Kensington, no doubt, is amply supported by the State, but it must be borne in mind that its object is the improvement of our art-manufactures. It justifies that support, and, in the opinion of competent judges, has mainly contributed to the marvellous advance in art-manufacture and decorative taste within the last thirty years, and the hope may be expressed that, in time, its influence may re-act upon the higher branches, and bad art will seem incongruous amid surroundings marked by perfect taste and harmonious colouring. The question before us, it will be remembered, is,—"What is

the influence exercised by our annual exhibitions of art and public taste?" And it has been attempted to show their influence is little, if any, on art, and that, on the contrary, they are controlled by public taste. But public taste, in this instance, means the taste of the upper and middle classes, who can afford to pay for admission and purchase catalogues. The masses of the people to whom these exhibitions might prove a boon, and a powerful civilising agent, are as completely excluded as if their existence was ignored. We are amazed at the refined feeling shown in the manufactures of France and other Continental states; but we forget that in these countries all art-galleries and exhibitions are free to the artisan, the mechanic, and the labourer, on the only day of the week on which they can enjoy and profit by them.

With us the same puritanism that banishes art from our churches hermetically seals all places of rational amusement to the lower orders, while with glaring inconsistency it leaves the gin-palaces and public-houses open for their delectation. How much misery, how much crime, might be prevented were our picture galleries, our exhibitions, our museums, and our botanic gardens opened free to the public on Sundays between the hours of three and six in the afternoon! And in what way could this privilege interfere with the religious services of the day? The inconsistency of the hackneyed answer, that this would deprive the custodians of public galleries of their day of rest is apparent, when we never hesitate to employ our own servants, our cab-drivers, and our railway *employés* on that day. In this city, remote as it is from the great art centres, we are fortunate in being among the first to recognise this great want. The Royal Hibernian Academy has for years back opened its annual exhibitions, for six weeks in each season, at the nominal sum of one penny, between the hours of eight and ten in the evening. The council at the same time supply a cheap edition of the catalogue, and what are the results? Within the last ten years 241,668 persons of the humbler classes have availed themselves of this advantage, and the numbers attending show a steady increase from 18,776 in 1871 to 30,739 in the last year. The galleries can only accommodate 900 at a time, yet the arrangements never permit of overcrowding, thus answering the objection frequently urged against free admission. It is worthy of remark that during these ten years not the slightest injury has occurred to either pictures or frames; and another notable fact, and one of great significance is, that the workmen who pay one penny for admission buy catalogues far exceeding in relative proportion the number purchased by the day visitors at 1s.

Mr. Mark H. Judge read a paper by Mr. W. Cave Thomas, which contained the following passages:—

Mr. Cave Thomas thinks that the prevailing notions on the relation of the fine arts to society are so erroneous that we should derive instruction by glancing at that relation in the historic past. The supporters of the vulgar notion that art civilises could hardly maintain that any but the highest, the best, could effect this end; yet we know that civilisation advanced along a highway disfigured by hideous, crude, and imperfect art. To elevate the masses, to show how powerless even the best art was to civilise, he pointed out that the vast legacy of art-treasures which the Italian people had ever present to them, from the "decadence" until now, were utterly unable to arrest the intellectual, political, and social decline of Italy, much less to resuscitate her, or even to revive painting and sculpture. When it is asked, what is the influence of our annual art exhibitions? Mr. Thomas emphatically replies, to make English art more and more representative,—representative of the *bizarre* tastes of the many. English artists, whatever their original aspirations may have been, are obliged to bow to public taste. However much we may be disposed to rail at the Royal Academy, it is totally unable to change by its exhibitions the tastes of the people; there is a power outside of and stronger than the Academy,—the mighty public's will and pleasure, and of these its exhibitions are consequently and perforce the exponents. It is this will and pleasure, if we desire to elevate art, that we must endeavour to alter and to right. And this, it would appear to him, is only to be accomplished by one or other of the two following ways:—Either by making the public think more deeply and consistently, or by a highly-educated class or caste setting the right fashion in art. For right leading, a demand for the higher forms of art is more potential for good than all the precepts and art talk in the world. Painters themselves cannot be expected to paint high-class but unsaleable pictures; nevertheless, there are artists who would be but too pleased to respond to a State art policy, which should demand the illustration of historic incident, of religious and poetic themes. A policy of this kind is that of all others the best calculated to hasten a grand national art development. And yet such a policy is persistently opposed by men who cannot distinguish between an oil-painting and a fresco. The power of art to instruct is little, but the power of art to please and to entertain is great. Art exhibitions, therefore, afford innocent entertainment and recreation for the mind, as long as the art exhibited observes moral limitations. And it is upon these grounds that the Sunday Society wisely and justly demand the opening of our galleries and our museums on Sundays. It will, indeed, be a great day for England and for English art when its chief exhibitions shall be in its public buildings and its highways, for then art will have escaped from the trammels of capricious patronage, to devote its energies to a national purpose. Who shall initiate the movement to this end, the State or the aristocracy?

Sir Robert Stewart, who at this stage was called upon to take the chair, said, as far as he could make out, the views of all the essayists were much in harmony, except that Sir Thomas Jones's remarks had a more local application, he having looked at art from a home point of view, while the other gentlemen spoke of it from experience gained on the other side of the water.

AT HASTINGS AND ST. LEONARDS.

Visitors to Hastings and St. Leonards during the season which has just closed will have noticed how rapidly these favourite watering-places are expanding, and the building activity which is discernible in the locality at almost every point northwards of the parade, both on the east and west sides. A noticeable feature amongst the several buildings in course of erection is that many of them are of a public and institutional character. These include the

Gaiety Theatre and Opera House, in the Queen's-road, immediately opposite the recently-opened new Town-hall. On a portion of the site on which the theatre is being erected, the river "Bourne" is said formerly to have flowed. Including the Gaiety Restaurant, which forms a portion of the block, and which was opened for business about a month since, the building will have a handsome frontage to Queen's-road 74 ft. in length, and upwards of 60 ft. in height, being faced with red Fareham brick, and Portland cement windows and dressings. The elevation will contain three stories above the ground-floor, with fluted pilasters on the upper floors, the frontage being surmounted by a balustraded parapet, with a central pediment inclosing windows, which will light the gallery saloon of the theatre. The principal entrance to the theatre, in the centre of the Queen's-road frontage, will be 10 ft. in width, having on each side massive piers, and surmounted by a projecting archway and balustrade, the doorway being flanked on each side with polished granite columns and carved capitals. The ground-floor portion of the Queen's-road frontage of the buildings is intended to be let for shops and other business purposes, and the upper floors for offices, to which there will be a separate entrance, immediately on the south side of the entrance to the theatre. The building is carried to a depth of 122 ft. eastward from the Queen's-road, having a frontage on the north side, where will be the entrances to the pit and gallery, and also to the stage, scene dock, and dressing-rooms connected with the theatre. The main entrance in Queen's-road leads to the stalls, dress-circle, and also to the upper circle, by a concrete staircase. There will be three rows of stalls having accommodation for an audience of sixty. The dress-circle and six private boxes will seat 200 persons; the upper circle 250; four rows of pit stalls, 120; and the pit itself, 350. The two front rows in the gallery will form the amphitheatre, having accommodation for an audience of 120; whilst the gallery itself will hold 400 persons, the capacity of the theatre being thus equal to an audience of 1,500. There will be a spacious promenade behind the dress-circle, with ladies' retiring-rooms, and also refreshment saloons in connexion with every part of the theatre. In addition to the ordinary approaches to the upper circle and gallery, there will also be relief staircases for use when required. All the floors and the several staircases will be connected with each other, thus affording facility for entrance and exit. The box and gallery frontage will be of the horse-shoe form. The width of the proscenium will be 25 ft., its height 36 ft., and the depth of the stage 32 ft. Under the stage there will be a mezzanine floor 7 ft. 6 in. in depth, with a well beneath it also 7 ft. deep. The theatre will be illuminated chiefly by a sun-light in the ceiling, which will also serve for ventilation purposes. The architects are Messrs. Cross & Wells, of Havelock-road, Hastings; Mr. Phipps, of Mecklenburg-square, London, acting as consulting architect; and Mr. Bodda, of Western-road, St. Leonards, is the builder. The estimated cost of the theatre, which is expected to be ready for opening by Christmas, is 12,000*l*.

The Albert Temperance Hall and Coffee Palace.—Immediately on the north side of the theatre, with one of its frontages in Queen's-road, and another deep frontage running parallel with the side frontage of the theatre, a large and commanding new building, called the Albert Temperance Hotel, has just been erected by the Hastings and St. Leonards Coffee Palace and Hotel Company, Limited. The foundation-stone was laid by Canon Basil Wilberforce in July, 1880, as indicated by the inscription on the memorial-stone, and within the last week or two the building has been completed, and is now being finished preparatory to its opening for business in a few days. The hotel from its height forms a prominent architectural feature in the locality of Queen's-road, but the width of the frontage to that thoroughfare is limited to 20 ft., the principal elevation being the return-frontage, in the narrow thoroughfare leading to Wellington-square, which is 82 ft. long. The two frontages are each 60 ft. in height to the parapet, with a Mansard roof, rising to a height of 75 ft., and two towers at the east and west end respectively, 85 ft. high from the ground-line, and which are surmounted by an ornamental iron cresting. The building is faced with Portland cement, which now seems to be a favourite material in building at Hastings, in preference to stone, on which the saline atmosphere of the locality is said to have an injurious effect. The hotel contains five lofty rooms, in addition to the basement, in which is the kitchen, and other apartments in connexion with the culinary department. The principal entrance at the corner of Queen's-road leads into a first-class restaurant, whilst another entrance leads into a spacious *café*, on the coffee-palace principle. The manager's offices are also on the ground-floor. The first floor contains the general coffee-room,—an apartment of large dimensions,—together with a ladies' coffee-room, and several private sitting-rooms. The second floor also contains a number of private sitting-rooms, whilst the floors above are all devoted to bed-rooms. Messrs. Cross & Wells are also the architects of the hotel, and Mr. Alfred Womersley, of Hastings, is the builder.

The Approaches to the Baths on the Parade.—The tepid salt-water swimming-baths on the parade at Hastings, said to be the largest baths of the kind in the world, have been illustrated in the *Builder*. The spacious and ornamental approaches to these baths, which were in an unfinished state when the baths themselves were opened, have recently been completed, and now form one of the most striking structural features on the parade. The materials of which the approaches are formed consist chiefly of terra-cotta of varied colours and designs, supplied by Messrs. Doulton & Sons, of the Lambeth Potteries. There are two distinct and separate approaches, one to the ladies' and the other to the gentlemen's baths. The floor-level of the entrance to the baths is about 20 ft. below the level of the parade, the baths' floor being reached by flights of steps 12 ft. in width. On each side of the approach-steps at the parade-level are ornamental piers surmounted by vases, all in terra cotta, and similar piers and vases at the foot of the stairs. The floor-level below is laid with encaustic tiles, and the open space around the floor leading to the baths is arcaded in terra cotta, and ornamented with several medallion figure-heads. The approaches at the parade-level are inclosed by dwarf walls in terra cotta, surmounted by iron railing.

A New Hospital for Poor Children.—The locality of Hastings and St. Leonards appears

to be regarded as a favourite one for the erection of convalescent homes and other institutions of that character for the recruiting of health. Only a few months ago the Princess Louise formally opened a Convalescent Home for Hertfordshire, which has been erected at West Marina, St. Leonard's, from the designs of Mr. T. Chatfeild Clarke, and another building of a kindred character, close adjoining, is now almost finished and ready for occupation. This institution, which is designated a "Hospital for Poor Children," is a large and handsome building, which has been erected on a lofty eminence to the westward of St. Leonard's, close to the West Marina Station of the London, Brighton, and South-Coast Company. It commands an extensive view of the east and west coast, and the surrounding county, with Beachy Head and Eastbourne in the distance. The lower portion of the building is faced with red brick, whilst the upper parts are tile-faced and in diaper work. The architecture partakes of the Queen Anne style, the several elevations being surmounted by gables, and a high-pitched roof in red tiles. A peculiar feature of the building consists of a vaulted playground immediately under the superstructure, and from which there is a full view of the sea. The building stands within its own spacious grounds, which are now being ornamentally laid out prior to the opening of the institution, which will shortly take place.

Proposed Extension of the St. Leonard's Parade.—Within the last year or two works of a very substantial character have been carried out at St. Leonards in the construction of a strong sea wall, and the extension of the parade westward, the entire length of the parade from the east end at Hastings being now about two miles and a half. We understand that the extension of the parade still further westward in the direction of the locality known as Bopeep and Bexhill, is contemplated by the local authorities, building in the immediate neighbourhood being at present going forward in the erection of residences of a good character.

Enlargement of the Hastings New Park.—The new park, a short distance to the north-west of the parade at Hastings, is at the present time being considerably extended and ornamentally laid out in the direction of the suburban localities known as Bohemia, Silverhill, and Hollington, and Hastings is more especially extending towards these three several districts by the erection of large numbers of mansions and residences, the effect of which is practically to change the suburban character of the localities named, and to absorb them into Hastings itself.

DESTRUCTION OF AN ANCIENT HOUSE.

The well-known dealers in rare books, the Messrs. Jefferies, of Bristol, included in their premises the chief rooms of the ancient building formerly occupied by William Canynge, who found the money to build part of Redcliff Church in that city. Few antiquaries who visited Bristol to inspect the relics of the past which it contains failed to look in at Canynge Buildings. On Friday in last week, we regret to say, the premises occupied by Messrs. Jefferies, including these ancient remains, and the very valuable stock of books and MSS. belonging to the firm, were for the most part destroyed by fire. The loss is estimated at 25,000*l.*; but, in truth, no amount of money will represent it.

OBITUARY.

Mr. A. M. Rymer-Jones, C.E.—The death is announced of Mr. Alexander Manson Rymer-Jones, Assoc.-Memb. Inst. C.E., second son of the late Professor Rymer-Jones, F.R.S. He died on the 5th inst. at Valencia del Ventoso, Spain, of fever. He was thirty-six years of age. He invented the "Temnograph," an instrument for levelling automatically, which is fully described in the "Minutes of Proceedings," of the Institution of Civil Engineers, vol. lxi., p. 268 (1879-80, part 3).

"Proceedings at the Clerkenwell Vestry."—A statement under this heading, in a recent issue, was not quite correct. The gentleman elected as assistant in the Surveyor's office (Mr. P. J. Killick) *was* one of the six candidates chosen by the committee, but the committee's decision was reversed to the extent that in their list the successful candidate stood fourth or fifth in order.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,101. Baron de Liebhaber, Avallon, France. Cleaning, polishing, &c., buildings, and articles of marble, stone, &c. Sept. 23, 1881.

4,102. A. Bedborough, Westminster. Window sashes and frames. Sept. 23, 1881.

4,103. J. Hardinge, Westminster. Combined cramp, nail-driver, punch, and gauge for working flooring, &c. Sept. 23, 1881.

4,109. M. F. Rush, Alderagate. Curtain rollers. Sept. 23, 1881.

4,115. F. Dyer, Camden-town. Flood valves for drains. Sept. 23, 1881.

4 119. A. M. Ross, Edinburgh. Laths for Venetian blinds. Sept. 24, 1881.

4,136. W. Truswell, Sheffield. Heating by steam. Sept. 26, 1881.

4,151. W. P. Thompson, Holborn. Fireplaces and grates. (Com. by J. M. Cook, Cincinnati, U.S.A.) Sept. 27, 1881.

4,152. W. R. Lake, Southampton-buildings. Apparatus for heating dwelling-houses, &c. (Com. by B. R. Hawley, Chicago, U.S.A.) Sept. 27, 1881.

4,157. F. Hamilton and F. A. Hamilton, Leadenhall-street. Reflectors. Sept. 27, 1881.

4,177. G. E. Wolff, Hamburg. Smoke-consuming firegrates. Sept. 28, 1881.

4,185. F. H. F. Engel, Hamburg. Treating calcareous bricks. (Com. by J. A. A. Reuck, Wickendorf, Germany.) Sept. 28, 1881.

4,187. G. W. Wigner and R. H. Harland, Great Tower-street. Apparatus for heating water by gas for baths, &c. Sept. 29, 1881.

4,188. G. Hatton, Southport. Outside Spanish sun-blinds. Sept. 29, 1881.

4,191. G. J. Cox, Maidstone. Gas cooking and heating stoves, &c. Sept. 29, 1881.

4,204. H. Parson, Dulwich. Securing casements and doors when partially or entirely closed. Sept. 29, 1881.

4,212. P. Spence, Manchester. Purifying sewage. Sept. 29, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

September 27, 1881.

2,342. F. Firth, J. Firth, and E. Firth, Dewsbury. Brickmaking machines. May 27, 1881.

2,422. W. R. Lake, Southampton-buildings. Fluid meter. (Com. by L. J. E. Jacqued, Paris.) June 1, 1881.

3,582. C. Winn, Birmingham. Water-waste preventers, &c. Aug. 17, 1881.

3 985. H. H. Lake, Southampton-buildings. Door knobs or handles. (Com. by C. C. Harrington, Newton, U.S.A.) Sept. 15, 1881.

September 30, 1881.

2,292. D. Nichols, Leeds. Laying gas, water, and other pipes, &c. May 25, 1881.

2,605. W. T. Sugg, Westminster. Sun-lights. June 15, 1881.

2,624. W. T. Sugg, Westminster. Gas cooking-stoves. June 16, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending October 1, 1881.

4,008. G. Jennings, Stangate. Steam apparatus for warming and ventilating houses, &c.

An apparatus similar to a tubular steam boiler is set on end, so that the tubes stand vertically. The lower ends of the tubes pass through the shell and open into an air-chamber which is supplied with the open air. The upper ends are above the top end plate, which forms a pan in which is water. This is heated by the hot air passing through the tubes and the steam thereby produced moistens the heated air. Steam is supplied to the interior of the shell which heats the tubes. Oct. 2, 1880. Price 6d.

475. P. Jensen, Chancery-lane. Apparatus for cleaning and rolling up carpets.

The carpet is fastened to a jointed endless belt which is passed round a series of rolls. Above the first roll is placed a brush. The carpet then passes under the beaters which are vibrating, and consist of elastic sticks or loops. These are raised by revolving cams and brought down again by springs. The dust falls into a drawer extending the whole length of the machine. The carpet then passes over a roller of a corrugated shape to open the back of the carpet, the dust from which is blown out by a centrifugal blower. Rotary brushes are used to clean the back of the upper web and the nap or outside of the carpet. After the cleaning, one end of the carpet is jammed into a slit in a spindle on the carriage and wound up thereon. (Com. by MM. Mayer, Langfildes, and Hammerschlag, Vienna.) Feb. 4, 1881. Price 6d.

644. G. E. Pritchett, Bishop's Stortford. Apparatus for heating, lighting, cooling, and ventilating.

This is a modification and improvement on Patent No. 1,613, of 1880, in doubling the plates formed of suitable shapes and also doubling the tubes. These may, however, be actuated and heated singly, and may be made portable if required. Feb. 16, 1881. Price 6d.

653. W. A. G. Schönheyder, Stoke Newington. Stoves for heating, lighting, and ventilating.

This relates to stoves for gas, oil, &c., and consists of a variety of improvements in details of construction, &c., which are described in fourteen pages of specification, and illustrated by sixteen figures in the drawings, but which are not capable of being condensed. Feb. 15, 1881. Price 1s. 2d.

700. H. B. Scott and H. V. R. Read, Westminster. Trough or multiple water-closets.

The trough under a number of closet-seats has one of its ends formed as a sloping weir, beyond which is the trap to the drain. The trough when in use is filled with water up to the level of the weir. At suitable times a volume of water is thrown into the trough from the end farthest from the weir. This flushing can conveniently be done by a syphon. Feb. 17, 1881. Price 4d.

702. G. Butler, Chiswick. Floor-cramps.

To the main strap is pivoted a fork from one end only, so that the fork partakes of an eccentric motion from the pivot when any back action of the main strap commences. The main strap is provided with slots, within which a ratchet, forming a cramping-bar, is free to move in one direction, under the action of a hand-lever and push-pawl, a stop-pawl being provided to hold the cramping-bar while the hand lever-pawl is moving back. The stop-pawl is furnished with a foot-plate that by a depression compels the stop-pawl to be released when the cramping has been effected, thereby releasing the fork from the joists. Feb. 18, 1881. Price 6d.

744. H. Skerrett, Sparkbrook. Door-chains or door-fastenings.

Instead of having a slotted cate fixed to the door for the necked stud of the free end of the chain to slide in, a stud is fitted on the door, and on the free end of the chain is a long link, slotted longitudinally, with a circular opening at the chain end of the link, for the passage of the head of the stud on the door. Feb. 21, 1881. Price 6d.

765. F. S. Willoughby, Stockport. Galleries or holders for gas and lamp globes and shades.

A spring bolt is used to secure the globe, &c., in the galleries, which slides in a hole or socket, and is pressed by a spring against the globe. (*Pro. Pro.*) Feb. 23, 1881. Price 2d.

769. H. Lecornu, Caen, France. Apparatus for cooking and heating.

Insulating boxes or hoods are made, and when the stove is properly heated, it is placed under one of these, and no more heat can escape, and the cooking goes on by itself. Feb. 23, 1881. Price 6d.

784. W. J. C. Joughin, Walthamstow. Automatic measuring cocks.

A turbine is fitted in the waterway beyond the cock, which shows the amount of water passing through. (*Pro. Pro.*) Feb. 24, 1881. Price 2d.

823. R. C. Cross, Dewsbury. Construction and glazing of windows and sashes.

The sash-bars are made in two parts, the outer part being a fixture, and the inner part being movable. The inside face of the outer part is rebated, and the glass being placed in position in the rebate, the inner part is secured over it by thumb-screws. The glass is, therefore, secured without the use of putty, &c. (*Pro. Pro.*) Feb. 26, 1881. Price 2d.

832. G. F. Phillips, Newgate-street. Fire-stove screen-frames.

On the feet are erected the upright pillars, which are hollow to receive bars, which can be moved up and down to fix the screens, secured to them at the desired heights. The base pillars have a transverse rod, to which also screws may be attached. (*Pro. Pro.*) Feb. 26, 1881. Price 2d.

849. J. H. Johnson, Lincoln's-inn-Fields. Bituminous cements and compositions for paving.

Coal-tar products being subject to oxidation by atmospheric air, the object of this invention is to oxidise them before they are laid for paving, &c., so that no deterioration afterwards may take place. The coal-tar products are subjected to a heat of say 300° Fahrenheit for twenty-four hours, during which all volatile oils are evaporated, and to effect more completely this oxidation, a small quantity of permanganic acid is also introduced. The heavy oils of petroleum may be treated in the same way, and brought to the condition of oxygenated bitumen. (Com. by E. J. De Smedt and W. J. Twining, Washington, U.S.A.). Feb. 28, 1881. Price 4d.

St. Pancras Industrial Exhibition.—The St. Pancras Industrial Exhibition was inaugurated at Tolmers-square Institute by the Lord Mayor, as president, on Saturday, the 8th inst. Messrs. H. M. Meech and M. A. Sweet, the honorary secretaries, explained the circumstances under which the Exhibition had originated, and the latter more especially pointed out the drawbacks which were experienced in obtaining new inventions from the industrious classes on account of want of proper protection by the operation of the existing patent laws. Mr. Sweet, with the consent of the Lord Mayor, moved the adoption of a petition to Parliament, which was carried unanimously, praying an amendment of the patent laws, by which the real inventor would have his invention protected at a small cost at the outset and an increasing fee year by year, which would improve the development of improvements in inventions consistent with justice to the inventor.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

THE SCULPTURE FOR BLACKFRIARS BRIDGE.

Sculptors who submitted designs for the groups proposed to be placed on Blackfriars Bridge by the Corporation in reply to advertisement are beginning to inquire discontentedly what has become of their models. This is not to be wondered at, seeing that it must be nearly a year since the advertisements appeared.

M. Deputy Rudkin is reported to have stated, at the Court of Common Council, that Sir Frederick Leighton, "after a considerable delay," had said it would not be desirable for him to give his opinion upon the designs by himself; and that the committee had decided to ask Messrs. Woolner, Marshall, and Armitage to act.

Sir F. Leighton was mentioned in the conditions under which this competition was instituted, as having agreed to assist with his advice; and it is rather late in the day for him now to decline that responsibility. It is, moreover, scarcely courteous to the competing artists to have kept them waiting so long before discovering this. Doubtless, however, Sir Frederick could explain.

This competition is for the purpose of selecting the *design*; the selection of the *sculptors* after the general design is arranged, is to follow.

The question is really an architectural one, and we are disposed to think that an architect would be more likely to select the best design, and be less liable to be impressed by modelling, than a sculptor, who might consider technical excellence more than architectural fitness and suitability to position. If the design should fall into the hands of the ordinary sculptor, and "pretty groups" be placed upon the piers regardless of architectural effect, another fine opportunity will be thrown away. Verily, they do manage these things better in France, where there is a proper co-relation between the architect and the sculptor, with a resulting monumental effect, for which we here look in vain.

There should have been a public exhibition of the designs during all this time, and the consensus of criticism might have brought about a good selection.

THE ROYAL COMEDY THEATRE.

The new theatre which has been erected from the designs of Mr. Verity, architect, at the corner of Panton-street and Oxenden-street, Haymarket, is advertised to be opened to the public on this (Saturday) evening. So many changes, however, have been made already in respect of this undertaking that we will not speak positively. We gave a view of the exterior of the building in our last volume, together with some particulars,* but it was then called "The Alexandra Theatre," and must be looked for under that heading. At that time, too, it was proposed, as we stated, to illuminate the auditory by the electric light, but, in consequence of difficulties which made themselves obvious at the recent exhibition in France, the intention has been abandoned for the present.

The general contractors for the building are Messrs. Kirk & Randall, of Woolwich. Mr. Little-johns has fitted the stage with all the newest appliances. Messrs. Jackson & Sons have executed the carton-pierre enrichments. The fireproof floors are of Dennett & Ingle's patent construction. The upholstering and seating have been done by Messrs. Shoolbred, who have also decorated the saloon on the right of the entrance vestibule. The general decorations have been carried out by Mr. E. Bradwell, and the act-drop is by Messrs. Howell & James. Mr. H. N. Taylor was the architect's clerk of works.

St. Vedast's, Foster-lane.—A correspondent writes:—"Can any one tell how much longer this fine, substantial, and sacred edifice is to remain closed? It is now several months since the church has had any divine service performed in it. Perhaps the parochial authorities of the united parishes can inform your readers and Churchmen the reason why, and say when this church is again likely to be re-opened for service. If they cannot, the fault lies with the higher authorities. If the Bishop of London is waiting until the quaint little Church of St. Matthew, Friday-street, is taken down before the former is opened, he may find such a scheme break down, and I sincerely hope and trust it may."

* Vol. xl., pp. 762 and 773.

"A VICTORY OVER SEWER GAS."

Sir,—I have no intention of entering into any discussion on the subject of my letter, published on October 1, describing a "Victory over Sewer Gas," which must stand upon its own merits; and I have no intention to examine "disconnecting ventilating traps," or any kind of traps, which, I hold, give unreliable and uncertain protection against gas generated in sewers or soil-pipes. Such gas is heavier than the air, and should be expelled with certainty. And these are the last words I shall trouble you with on the subject, at least for the present.

Mr. Mineard is the proper person to defend his invention, and is prepared to do so. I merely wished to give my personal testimony, which goes for what it is worth.

Henry Cole.

Sir,—I am pleased to see the scheme of house-drainage fully illustrated and described by Sir Henry Cole, and more so as the general arrangement is, in its main features (less the heating chamber) similar to the double-check system introduced by myself many years since, and described in "An Architect's Letter," published by Messrs. Spon, a copy of which is in the library of the Royal Institute of British Architects, and also read in the Society of Arts rooms at the Sanitary Conference in May, 1879.

The double-check system consists of a drain under or round the dwelling-house, a pipe at the back of the house and a pipe at the front of the house, large, and both extending above the roof, having curved terminals, one pointing one way and one the other, and between the drain and the main sewer is fixed a double trap, having two separate water-seals, and a vent-pipe between them.

The system has been in operation in Bristol, Clifton, and neighbourhood many years, and there has not been one failure; and although I have often tested houses fitted upon this system, I always found a current of air passing through the drains and pipes; and, with my experience, I am decidedly of opinion that the heating-chamber is a mistake, for although, under the care of Sir Henry Cole, the gas would probably be kept burning and the burner in proper condition, with ninety-nine persons out of one hundred no care would be taken in the matter, the general public feeling no interest, the light would be put out, and the 50s. per year cost saved; or the light might accidentally go out, then what would be the result? Why, the double-check system would be in operation to an extent, air would pass down one pipe and up the other, and constantly reversing, a good deal depending upon the temperature of the back or front of the house; or when the closets were emptied, or storms on, to form plugs or pistons of water in the vertical pipes, air would then be forced toward the front of the house, and drawn into the pipes from the back; but in the case of a reverse action (or the air passing down one back pipe and up another), drain-air would pass up the back vertical pipes, under the gutters, and if the roofs were tiled, or laid with zinc, would pass under the eaves and into the roofs, through the ceilings and into the sleeping and other rooms, the single trap would absorb the sewer-gas and give it off the house-side, and make matters worse.

In my experience of more than thirty years in the profession I have found that when things about buildings require attention, they are seldom for any length of time attended to, and, therefore, every fitting should be self-acting. No lighting, no oiling, and no attention. There are other minor defects in the details of the described scheme, such as liability of syphonage, double-pipe inlet, single outlet, &c., which your readers will no doubt detect; but the facility given for sweeping the horizontal drain is a good feature.

I cannot agree that the scheme is a sure victory over sewer-gas. Henry Masters.

Sir,—As the person responsible both for plan of house-drains and also for the way in which the work has been carried out at 106, Philbeach-gardens, Sir Henry Cole has called my attention to Mr. Buchan's criticism in this week's *Builder*, as he thinks I am the party (if any) who should reply to same.

1. Mr. Buchan seems to have fallen into his own trap, as his note savours too much of shop and to be merely recommending his own trap; and as the particular trap used by me is no essential feature in the system, I am at liberty and should use the trap that is, in my opinion, best suited to my own requirements.

2. The quibble as to sewer-gas is unworthy of serious reply. I understand sewer-gas to be the gas generated by the decomposition of sewage matter, whether it occurs in the main drains or merely from the residue unavoidably left in traps, soil-pipes, and house-drains; and I have never heard of any sane builder, much less sanitary expert, who questioned the necessity of shutting off by a *good* trap the sewer-gas from main drains. While admitting that even the best traps could not, under all circumstances, be relied on, yet it is undoubtedly principally with the gases generated in the house system that we have to deal. I claim that in my plan not only are the gases generated in house system effectually removed, but that, in the event of leakage through trap from main drains, the gases passing the trap would rush with the warm current up the upcast-shaft instead of passing under or into the house.

3. Mr. Buchan says that if joints are defective, &c., the upcast shaft will draw its supply from the inlets nearest the heating-chamber. Of course it will; therefore we make it draw its *ordinary* supply down the soil-pipe from the top of the house; and as any water-closet, with valve opened after use, provides a nearer inlet, it accounts for the *down*-draught through the apparatus of water-closets.

As for the defective joints, &c., any defect from work scamped has nothing to do with my particular principle, but applies equally to all methods employed; but where (as in this case) it is open to every householder or member of a family to try for himself whether the system is in good working order or not, without sending for sanitarian or plumber, surely the risk from defective work is reduced to a minimum.

4. Mr. Buchan speaks of the enormous forces employed. It needs a Scot, excruciating on his political economy, to speak of "twa bawbees'" worth of gas used in twelve hours as *enormous*.

5. With respect to the plans. The plans inserted were plans of Sir Henry Cole's first house, and merely showed the application of my method to a house built on the same plan as the vast majority of London houses. In addition to that, the plans were not carefully got out for purposes of illustration, but merely an old office set that I had to clean up at the last moment, owing to the fact that a set of plans I had specially ordered did not reach me in time to send a more complete one.

6. I am most particular to trap all my wastes, baths, lavatories, housemaids' sinks, and butlers' pantries, using Beard & Dent's P traps, with brass screwed caps, and Antill's trap for scullery waste; so there I confess my draughtsman inaccurate.

7. The portion of drain from servants' w.c., about 12 ft., needs a ¾ inlet, which would give a slightly less current down the soil-pipe, or what would be preferable, treatment like the best w.c.'s, namely removal of trap and substitution of good valve-closet. Unfortunately we cannot always afford the very best appliances for servants' apartments.

8. Mr. Buchan says that putting in an apparatus for blowing off stinking air continuously is not a plan to be recommended: to which I reply,—that inasmuch as the whole of the air in soil-pipes, house-drains, and upcast is changed two or three times every minute, and any sewer-gas passing is brought in contact with the flames in the heating-chamber, which consumes anything of an offensive character, the air passing from our upcast is rendered considerably purer than it is by any other process.

As, Mr. Editor, I find (from the number of visitors calling to see the system working, as well as from letters I have received) there is a considerable amount of interest in the public mind on the subject, if you will grant me space in your valuable paper, I will prepare a short statement showing what I consider the defects in other systems, and what are the merits of my own. G. E. Mineard.

Competition: Hospital for Sick Children, Bristol.—Designs for the above were invited by advertisement in the local papers, and a number of architects responded. After consideration of the designs by the committee and medical staff, those prepared by Mr. Robert Curwin, of London and Liverpool, were adopted. The hospital is intended to accommodate seventy-seven patients.

THE WORD "NATURE" IN REFERENCE TO ART.

SIR,—It would seem desirable that some simple definition of the word "nature" should precede a discussion upon art-matters.

Two principal meanings have been very concisely expressed by John Stuart Mill:—"In one sense it means all the powers existing in either the outer or the inner world, and everything which takes place by means of those powers. In another sense it means not everything which happens, but only what takes place without the agency, or without the voluntary and intentional agency, of man. This distinction," he writes, "is far from exhausting the ambiguities of the word; but it is the key to most of those on which important consequences depend."

It is plainly evident that Mr. Colling, in his comparisons, regards nature in the latter sense, and, having explored one little corner of a boundless repository of natural forms or "physical facts," he simply and plainly states the fact that of all the forms known to him which are applicable to decorative art, those which are founded upon geometrical bases are the most pleasing and satisfactory.

The somewhat confused sentence to which you rightly take exception, and at the same time as clearly explain, would seem to be intended to emphasise the prevalence of geometrical forms in those "physical facts" which have been examined by him, and to suggest that further research would have an analogous result.

JAMES SMITH.

THE DAWSON MEMORIAL STATUE.

SIR,—Dissatisfaction continues to be expressed in Birmingham with the new Dawson statue, lately unveiled. The figure is the work of Mr. Woolner, R.A., for which he has been paid 1,200*l*. It is of marble, and represents the man in the act of addressing an audience, with his body resting on his left leg, and the right advanced, the fingers of the right hand placed in the palm of the left hand, which is open, and has the fingers bent backward very much,—unnaturally so. This particular position of the hands is one which George Dawson never assumed.

The drapery consists of a Tooa coat and trousers, both of which are very much too large for the figure, and are in consequence full of creases. The coat lies close over the vest unbuttoned. The head is very disappointing, his most intimate friends fail to recognise the lineaments.

A meeting of the subscribers is called for an early date next week, when it will be proposed to replace the present statue by another, and remove this to some less prominent position in a niche of the new Art Gallery or other suitable place, or to deal in some other manner with it.

The canopy covering the statue is as yet unfinished. It is so overladen with carving that what it lacks in dignity is made up for by crockets. OBSERVER.

BREEDING FEVER: MARYLEBONE.

At the Marylebone Police-court last week, the owner of Nos. 2 and 4 Charles-street, Lisson-grove, was summoned by the Marylebone Vestry for allowing nuisances to exist on those premises to the danger of health. Mr. W. E. Greenwell, solicitor to the Marylebone Vestry, prosecuted, and stated that fourteen cases of typhus fever had already occurred in the street named. The houses were constantly under the notice of the Vestry, and proceedings were being taken under Torrens's Act. The surveyor had examined No. 4, and found under the flooring of one of the rooms in the basement sewage matter to the depth of 6 in., and under the floor of the basement of No. 2 liquid sewage matter to the extent of 2 ft., due to defective sewerage. Though the two houses were reported by the medical officer of health to be unfit for habitation, they had several families in them, and persons were even living in the room adjoining that under which the sewage was found. Evidence having been given, Mr. Cooke made an order that the two houses be cleared of the occupants at once, and that the offensive matter be removed within a week.

A QUERY.

SIR,—I beg to direct the attention of our profession in England to the disinterested offer of Messrs. Deane & Sons of "their gratuitous professional services" to the Committee of the Exhibition of Irish Manufactures, as is reported in Saturday's Dublin papers, of which I enclose a cutting.

It may be that I am very ignorant of what is conducive to the dignity of the profession, and I would, therefore, feel obliged if some of your readers would enlighten me by answering the following queries:—1. Is it usual for English architects to offer unsolicited "their gratuitous professional services"? 2. Are any members of the above-mentioned firm Fellows or Associates of the R.I.B.A.?

AN IRISH ARCHITECT.

Smoke Abatement Exhibition.—In regard to the exhibition at South Kensington we are informed that it will be opened next month. A large number of exhibits are coming forward, not only from the chief London manufacturers of heating apparatus, but from Sheffield, Birmingham, Manchester, Liverpool, &c., a variety of improved heating and smoke-preventing appliances and smokeless fuels are offered for exhibition and practical testing by the Smoke Abatement Committee. There will be exhibits from foreign countries also.

Miscellanea.

The Telephone and the Stage.—At the Royal Dublin Society's *conversazione*, given in honour of the Social Science Association, a stream of visitors flowed towards the room where it was announced that they would hear by telephone Mr. Irving's and Miss Terry's performance of "The Cup" and "The Belle's Stratagem" in the Gaiety Theatre. Two wires had been laid from the theatre, in the interior of which some eighteen or twenty receivers had been placed. The auditorium at the Dublin Society House was furnished with eighteen pairs of ear-pieces. The strictest silence was enjoined and was observed as far as possible, although a slight rustling from the entrance and exit of the visitors could not be prevented. The effect obtained is extraordinary, and not easily described. According to *Freeman's Journal*, the ear perceived a miniature sound-picture of the voice of Irving, in which every inflection was as distinctly marked as the lights and shades in a photograph. It was not, however, possible to follow the words distinctly. Every now and then a word could be recognised, and no doubt a person who was familiar with the play,—or with any other play transmitted in like manner,—would be able to follow the words very much better than those not possessed of that advantage. The widely different tones of Miss Terry were also reproduced with singular distinctness. The sounds of the music were much more audible. Still, all was miniature. It was very much as if the speaking and the music were heard through a thick wooden partition. It must be borne in mind, however, that the arrangements requisite for the display subjected the telephone to a very severe test. The lapping of the wires by such a number of ear-pieces in the listening-chamber reduced the sound of each, and a further diminution of effect was caused by the subdued noise of the crowd in the house. The apparatus was supplied by Messrs. Prescott, and the telephones were lent by Mr. Arthur Porte, of the United Telephone Company.

The "Art and Mystery" of Sweeping Streets.—At a meeting of the City Commission of Sewers, on Tuesday, Mr. W. Braham, on behalf of the Streets Committee, asked for authority to appoint an assistant-superintendent of cleansing, &c., at a salary of 250*l*. a year. Mr. J. Cox thought any gentleman appointed at a salary of 250*l*. a year should receive his appointment from the Court. Mr. Deputy Rudkin said it was unsafe to delay this question, as the winter was approaching. They wanted some one in case the Superintendent should fail through ill-health. They proposed to give 250*l*. because they required a really capable man. If the selection was left with the Commission they would be inundated with candidates, and they would in all probability appoint the wrong man, because they would have no knowledge of his qualifications. Mr. Deputy Hora was in favour of the committee selecting three candidates. Mr. Innes thought the Commission might trust the committee in a matter of that kind. Mr. Gover supported this view. Mr. J. Cox was not aware that the art and mystery of sweeping streets required so much consideration. That argument would apply all round. They might want an assistant engineer, an assistant solicitor, or an assistant medical officer. This was a fresh appointment, and he moved as an amendment that several names should be submitted to the Commission for final decision. The amendment was put and lost, and the original motion, with the words added, "reporting the appointment for confirmation by this Court," was adopted.

Mount Stuart, Rothesay.—The heating and ventilation of Mount Stuart, now being erected for the Marquis of Bute, under the superintendence of Messrs. Anderson & Browne, architects, Edinburgh, has been entrusted to Mr. Wilson W. Phipson, engineer, London. The system selected for this important building is the forced introduction of fresh air previously warmed in distinct chambers, by an improved plan of hot water and steam combined.

The Turners' Company.—The works submitted in competition for prizes offered by the Worshipful Company of Turners, and now in the ball-room at the Mansion House, are superior, as a whole, to any previous collection sent in reply to the company's advertisements. The judges have been at work the last two days making their awards, and the prizes will be delivered by the Lord Mayor on this, Saturday morning, the 15th inst.

Unhealthy Property in Bishopsgate.—At the last meeting of the City Commission of Sewers, the clerk read a letter from the vestry clerk of St. Botolph, Bishopsgate, with resolution of vestry, calling attention to the present filthy condition of several houses in Windsor-street and Widegate-street. Mr. Clark (the inspector), in reply to questions, said the whole of the houses in Windsor-street and Widegate-street had been served with notices for the houses to be thoroughly cleaned and white-washed, and the drains had been attended to as recently as June. The inhabitants were a filthy lot of people. Mr. Boor asked if the medical officer had inspected the property within the last six months? The medical officer said he had seen it three times within the last six months, and the allegation of its being overcrowded was incorrect. There were fifty-five rooms and 164 inhabitants, 2·09 per cent. per room, which was not crowding in any sense of the word. These properties were generally washed over with hot lime, and the moment it dried he would defy any one to say whether it had been lime-whited or not. The behaviour of the inhabitants was simply that of savages. They did not seem to be at all bound by the common decencies of life, and he did not know that he was not libelling the savages to compare them with these people. Nothing could be more inhumanising than the atrocious habits of the inhabitants of Windsor-street and Widegate-street. The only thing was to clear the houses of the present tenants and make them decent habitations. The letter was referred to the Sanitary Committee.

Proposed New Fish Market at Liverpool.—Liverpool, like London, has its fish-market question. A special meeting of the Markets Committee of the Corporation was held on Tuesday last to consider the question of the site of the proposed new fish market. The committee had a long discussion on the resolution of the corporation instructing them to report as to the best site, the probable cost, and the probable returns obtainable from the new market. The acquisition of some premises in Great Charlotte-street and the extension of the present market there was advocated by one member of the committee, but the site known as Lucas's site was more favourably received. Both Mr. Vaughan and Mr. Miles expressed themselves strongly in favour of the Nash-grove site, which, it was said, would secure a concentration of the wholesale markets, and avoid a large outlay for the acquisition of a site. Considerable discussion took place in reference to these different sites, and it was eventually resolved, "That, having regard to the approaching close of the municipal year, it is recommended that the consideration of the subject of providing an extension of the wholesale fish market be deferred until the appointment of the new committee."

The Drainage of the Lower Thames Valley.—At a meeting of the Lower Thames Valley Main Sewerage Board, presided over by Sir T. J. Nelson, a letter was read from the Local Government Board acknowledging the receipt of a copy of a resolution passed by the Joint Board with regard to the terms upon which the West Kent Main Sewerage Board were willing to arrange for the discharge into their sewers of sewage from the Lower Thames Valley district, and stating that the Board much regretted to learn that the last proposals of the West Kent Board were such that the Joint Board had felt themselves unable to agree to them. It was stated by the Chairman that the time was very shortly coming when they would have sat there four years, and the only result they had to show for it was an unfortunate expenditure of a very large sum of money, which had absolutely resulted in nothing. Where does the blame rest?

The Macleod Gate Latch.—A gate-latch seems a small matter, but the result, on particular occasions, as between one that will act efficiently and one that will not, may be important. The Macleod latch is simple, durable, and can be opened easily on either side of the gate. One chief claim in its favour is that being fixed, not, as in the usual way, on the gate, but on the gate-post, whilst on the gate itself is the bolt, which is simply a straight iron rod, should the gate and post vary ever so much in their positions, as they constantly do by sinking or otherwise, the variation may at once be compensated, without cost or trouble, by raising or lowering this iron rod. Mr. William Kirkpatrick, of Walsall, has undertaken the manufacture.

What Worms Do.—The main purpose of Mr. Darwin's new book is to show that what is generally called "vegetable" mould is almost solely the work of worms, and is, therefore, more animal than vegetable. The *Times*, in an appreciatory review of the work, says,—They are constantly swallowing earth and tiny stones, and passing them through their bodies to the surface in a finely triturated and fertilised condition; in fact, they may be said to manure the earth inside their own bodies. By means of this process the entire earthy surface of a country is constantly in a state of change. The whole earth underneath our feet all over the world is swarming with worms; probably all over there are in every acre of land from 35,000 to 50,000 worms. Every one is familiar with the casts of worms, which themselves look like worms of earth. With so many worms at work, then, it is not difficult to imagine what will be the effect of a constant accumulation of such casts. In some cases, if spread over the ground, they would measure ¼ in. in depth per year, equal to 1 in. of earth brought up from below, passed through the bodies of worms, and deposited on the surface in five years. In one instance given by Mr. Darwin, 12 oz. of castings were thrown up in a year on a square foot, or 6·75 lb. on the square yard, equal to 14½ tons of so-called fertile "vegetable" mould over an acre in one year. Leaves, and stones, and lime, and other substance spread over a field, and left untouched, have been found in a very few years several inches below the surface, in a uniform layer. This, there can be no doubt, from the multitude of data supplied by Mr. Darwin, is all the work of worms. The millions of leaves and other vegetable matter dragged by the persevering creatures underneath the soil, whether passed through their bodies or not, form a splendid natural manure.

The Photographic Society's Exhibition.—The collection of works now on view in the Water-Colour Gallery, Pall Mall East, 582 in number, suggests at first sight to the ordinary visitor little advance over preceding exhibitions. Examination, however, shows that it has a special characteristic, that is, a collection of works instantaneously produced and never before equalled. The extreme sensitiveness of gelatine plates is now utilised completely by the adoption of instantaneous shutters, and we are told that a negative may actually be obtained in the 200th part of a second. In the gallery there is a frame of subjects by Mr. Henry Dixon, representing a number of athletes in various positions, running, jumping, and leaping, each figure being perfect in detail, and the outline as sharp and clean cut as an engraving. The outline of the falling athlete is not slurred in the least, but is absolutely clear, and every detail of costume and physiognomy is accurately delineated. Mr. J. T. Dixon has a frame of studies of animals by the same process, and these are enlarged without being retouched, coming out very clearly, and the lifelikeness of the animal is consequently assured. The small views, *carte de visite* size, would scarcely attract attention, but being enlarged every detail comes out in the perfect manner, and the result is little less than a marvel. Mr. William Bedford, Mr. Joseph Gale, Mr. T. G. Whaite, Mr. H. F. Robinson, and others have received medals for works of different kinds which they exhibit here. We advise a visit.

Enlargement of the Mint.—During the discussion before a Parliamentary committee last session the capabilities of the Mint to meet the additional requirements were strongly urged as a reason against the proposed removal to the Thames Embankment, provided an enlargement of the present premises were carried out, and additional machinery provided; and the Embankment site was decided against. In accordance with that decision the Government have purchased some surrounding property, and the extension of the establishment is to be proceeded with.—*City Press.*

Birmingham.—Messrs. Camm Brothers, of Smethwick, near Birmingham, have recently set up five stained glass windows in the church of St. Silas, Aston, near Birmingham. The subjects are: "The Charity of Dorcas," "The Good Samaritan," "St. John the Baptist," "Christ Feeding the Multitude," and "St. James."

Devonshire Hospital, Buxton.—The new extension buildings of the Devonshire Hospital and Buxton Bath Charity were opened on Tuesday last, by his Grace the Duke of Devonshire. We shall have more to say about them in a future number.

Unprotected Churches in East Anglia. Taking as his text our inquiry whether the Church of South Wootton, Norfolk,—recently seriously injured by lightning,—was provided with a conductor, Mr. E. P. Loftus Brock, in a letter to the *Times*, says that, as far as his experience goes, lightning conductors are all but conspicuous by their absence in East Anglia. He writes,—"During the Great Yarmouth Congress of the British Archæological Association, in 1879, I had occasion again and again to call attention, on visiting some of the beautiful churches included in our programme, to the fact that they were not provided with these ordinary means of safety. The money value of the buildings inspected and thus undefended I may moderately estimate at 200,000*l.*, while their antiquarian and historical interest could not, of course, be replaced by any monetary consideration." He urges that archdeacons or other ecclesiastical authorities might address themselves to the protection of these churches with good results.

R.C. Church of St. Joseph, Guildford.—The new R.C. Church of St. Joseph, Chertsey-street, Guildford, is to be opened on the 19th inst. by Cardinal Manning. The completed portion of the design will seat 200 adults. A side aisle and lady-chapel remain to be added hereafter. Messrs. Mitchell, Bros., of Stratford, near Guildford, have carried out the works, and the architect is Mr. E. Ingress Bell.

Lincoln Surveyorship.—At the meeting of the Lincoln Court of Sewers, last week, Mr. Thropp was unanimously elected surveyor to the court, in the room of the late Mr. J. S. Padley, whose death was recently announced in our columns. Mr. Thropp, as partner and deputy of the late surveyor, has done the work of the office for many years.

TENDERS

For additions and alterations to the Joint Counties Asylum, Abergavenny. Messrs. Giles & Gough, architects. Quantities by Mr C. H. Goode:—

Sanders, Southampton	£55,785	0	0
Trevena, Plymouth	54,950	0	0
Thomas, Watkins, & Jenkins, Swansea	50,600	0	0
Church, Bristol	49,849	0	0
Welsh, Hereford	49,301	0	0
Bowers, Hereford	49,000	0	0
Burton, Cardiff	48,980	0	0
Pattinson, Sleaford	47,600	0	0
Ashbee & Son, Gloucester	47,100	0	0
Everal, Malvern	47,000	0	0
Crowe, Hereford	46,500	0	0
Lovatt, Wolverhampton	45,541	0	0
Barnsley & Sons, Birmingham	44,400	0	0
Davies Cousins, Cardiff	44,000	0	0
Garlick, Birmingham	42,981	0	0
Horsman & Co., Wolverhampton (accepted)	42,000	0	0

For alterations, &c., to 118, 120, and 122, High-street, Clapham. Mr. Johnson, architect. Quantities by Messrs. Northcroft, Son, & Neighbour:—

Patman & Fotheringham	£2,059	0	0
Lawrie, Bros.	1,980	0	0
Hall	1,928	0	0
Earl & Son	1,833	0	0
Hobson	1,873	0	0
McLachlan & Sons	1,814	0	0
Maxwell	1,749	0	0
Mills	1,700	0	0
Sawyer	1,677	0	0
Lane & Son	1,634	0	0
Thorpe	1,549	0	0

For lodge and stables at Start's Hill, Orpington. Mr. G. St. Pierre Harris, architect. Quantities by Mr. C. Stanger:—

Haisman (accepted)	£391	0	0

For altering and converting nine private houses into shops, at Vicarage-lane, Stratford, for Mr. J. Wilton. Mr. W. P. Taylor, architect:—

E. Northwood (accepted)	£212	0	0

For the erection of foreman's house and offices adjoining, in Carpenter's-road, Stratford, for Messrs. J. Wilton & Sons. Mr. W. P. Taylor, architect:—

Norton & Son	£515	0	0
G. Hooking	497	0	0
North, Bros.	430	0	0
E. Northwood (accepted)	304	18	0

For the erection of a residence and stabling at Nutley, Sussex. Mr. R. Wheeler, architect:—
Candler (accepted).

For proposed villa to be erected in Lordship-lane, Dulwich, for Mr. J. Henderson. Mr. E. Peters, architect:—

B. Downs	£1,430	0	0
Ennor, Julian, & Co.	1,405	0	0
Pierse & Banyard	1,390	0	0
Gillett	1,385	0	0
Watson (accepted)	1,325	0	0

For alterations to Highbury House, South Norwood, for Mr. A. T. Grantham. Mr. E. Peters, architect:—
Hollidge (accepted).

For the repairs of sea-wall and construction of groynes and new outfall for the Commissioners of the Level of Teadring, Essex. Mr. W. Berrell, engineer. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Hill & Co.	£9,632	0	0
Botterill	8,169	0	0
Chamberlain	7,473	0	0
Barnes	6,924	0	0
Harrison	6,850	0	0
Tyler	5,893	0	0
Saunders	5,840	0	0
James	5,801	0	0
Hunter	5,678	0	0
Maran	5,648	0	0
Walker (accepted)	5,132	0	0

For alterations and additions at No 39, Middle street, Brighton, for Mr. C. Catt. Mr. S. Denman, architect:—

Cheesman	£860	0	0
Parsons	802	10	0
Newnham	802	0	0
Patching	790	0	0
Dean	770	0	0
Garrett	755	0	0
Wright (accepted)	694	0	0

For three shops adjoining the Greyhound, Lea Bridge-road. Mr. Cotton, architect:—

Handley	£2,489	0	0
Hewlett	2,378	0	0
Tomms	2,245	0	0
Shurmur	2,187	0	0
Hayworth	2,049	0	0
Jackson & Todd	1,849	0	0
Edwards	1,480	0	0
W. Young	1,193	0	0

For the enlargement of the Penrose-street School, Walworth, by 700 places, for the School Board for London. Mr. E. R. Robson, architect:—

J. Marsland	£7,667	0	0
J. D. Hobson	7,455	0	0
E. Lawrance	7,400	0	0
B. E. Nightingale	7,393	0	0
Higgs & Hill	7,334	0	0
Stimpson & Co.	7,289	0	0
Kirk & Randall	7,189	0	0
W. Shepherd	6,959	0	0
S. J. Jerrard	6,925	0	0
C. Wall	6,920	0	0
W. Tongue*	6,877	0	0

* Recommended for acceptance.

For the enlargement of the school in Wood's-road, Peckham, by 600 places, for the School Board for London. Mr. E. R. Robson, architect:—

Kirk & Randall*	£4,513	0	0

* Recommended for acceptance. Based on the contract schedule of prices, this firm having erected the school.

For the erection of a school to provide accommodation for 800 children, in Melvin-road, Penge, for the School Board for London. Mr. E. R. Robson, architect:—

Higgs & Hill	£9,394	0	0
Atherton & Latta	9,284	0	0
W. Tongue	9,273	0	0
J. T. Chappell	9,256	0	0
J. Grover	9,185	0	0
Kirk & Randall	9,169	0	0
S. J. Jerrard*	9,143	0	0

* Recommended for acceptance.

For the erection of a school to provide accommodation for 800 children in Nynehead-street, Clifton-road, for the School Board for London. Mr. E. R. Robson, architect:—

Higgs & Hill	£9,890	0	0
Atherton & Latta	9,450	0	0
W. Tongue	9,349	0	0
J. Grover	9,296	0	0
J. T. Chappell	9,277	0	0
Kirk & Randall	9,245	0	0
S. J. Jerrard*	9,193	0	0

* Recommended for acceptance.

For painting, &c., at Homerton, for the Hackney Union. Messrs. Lee & Smith, architects:—

Jolley & Callen	£2,839	0	0
Pope	2,541	0	0
Goodman	2,522	0	0
Martin & Goddard	1,9 6	0	0
Shurmur	1,8 3	0	0
Everhard	1,829	0	0
Barber, Son, & Co.	1,820	0	0
Gentry	1,783	0	0
Roberts	1,634	0	0
Fiaxman	1,460	0	0
Wells & Co.	1,297	0	0
Blow	1,296	0	0
Burman	1,242	0	0
Barker & Co.	1,230	0	0
Williams	1,195	0	0
S. Stevenson	1,147	0	0
Macarty	816	0	0

For two houses, South Kensington. Messrs. George & Peto, architects. Quantities by Messrs. Stonor & Sons:—

Simpson	£16,549	0	0
Williams & Son	15,125	0	0
Colls & Sons	14,488	0	0
Brass	14,371	0	0
Ashby, Bros.	14,147	0	0
McLachlan & Sons	13,911	0	0
Manley	13,050	0	0
Stevens	12,765	0	0

For the enlargement of the Harrow Green Schools, Leyton, Essex, for the Leyton School Board. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

J. G. Hoskings	£1,645	0	0
J. A. Reed	1,623	0	0
J. Morter	1,593	0	0
Hearle & Son	1,533	0	0
Caines	1,445	0	0
Arber	1,429	0	0
North, Bros.	1,365	0	0
A. Reed	1,360	0	0

For a new warehouse, King Edward-street, Blackfriars, for Messrs. Spicer. Mr. R. Roberts, architect. Quantities by architect :—

Wheeler	£27,424	0	0
Bruton & Sons	22,848	0	0
Woodbridge	22,700	0	0
Parker	22,171	0	0
Young & Co.	22,000	0	0
Martin, Wells, & Co.	21,965	0	0
Spencer & Co.	21,625	0	0
Grover	21,389	0	0
Marsland	21,366	0	0
Sabey & Sons	21,350	0	0
Crockett	21,321	0	0
Staines & Son	21,280	0	0
Tyerman	21,135	0	0
Jones & Co.	21,072	0	0
Seal, Bros.	21,003	0	0
Batley	20,992	0	0
Killby	20,860	0	0
Hart	20,730	0	0
Manley	20,557	0	0
Hack, Bros.	20,541	0	0
Kirk & Randall	20,365	0	0
Stephens & Bastow	20,000	0	0
Perry & Co.	19,997	0	0
Roberts	19,977	0	0
Shurmur	19,944	0	0
Higgs & Hill	19,945	0	0
Feto, Bros.	19,736	0	0
Chappell	19,667	0	0
Wall	19,560	0	0
Gregor	19,474	0	0
Conder	19,433	0	0
Nightingale	19,253	0	0
Richardson	18,990	0	0
Rider & Son	18,988	0	0
Iris	18,903	0	0
Reddin	18,888	0	0
Crooker	18,828	0	0
Ashby & Horner	18,600	0	0
Shaw	18,100	0	0
Gentry	17,990	0	0

For sundry works at No. 7, Great Portland-street. Mr. R. Reid, architect :—

Ebbs & Son	£283	10	0
Hatfield & Son	258	0	0
Foxley	218	0	0

For the erection of stabling at Richmond, Surrey, for Mr. J. E. Muller. Mr. E. Maynard, architect. Quantities supplied :—

F. Hampton	£520	0	0
Sweet & Loader	518	0	0
T. J. Carless (accepted)	512	0	0

For alterations and repairs at 17, Porchester-terrace, W. Mr. C. J. Knight, architect :—

Stanley G. Bird	£335	0	0
Foxley	729	0	0
Hatfield & Son	545	0	0

For the erection of schools for 834 children, in Bretterham-road, Edmonton, including covered play-grounds, walls, out-buildings, and fences, for the School Board for Edmonton. Mr. A. R. Barker, architect. Quantities by Mr. W. B. Brown :—

Patman	£8,356	0	0
Humphreys	8,336	0	0
Kilby	7,879	0	0
Dove, Bros.	7,625	0	0
Bromwich, Foster, & Co.	7,581	0	0
Wall	7,495	0	0
Shaw	7,215	0	0
Gardner	7,010	0	0
Tongue (accepted)	6,814	0	0

For extension of factory, for Mr. J. T. Morton, Millwall. Mr. W. Eve, architect. Quantities supplied :—

Boyce	£1,873	0	0
Nightingale	1,772	0	0
Crabb	1,764	0	0
Morter	1,769	0	0
Niblett	1,750	0	0
Hall, Beddall, & Co.	1,719	0	0
Abraham	1,697	0	0
Macey	1,616	0	0
Lawrence	1,579	0	0
Harris & Wardrop	1,574	0	0
Crisp & Tomlin	1,517	0	0
Shurmur	1,485	0	0
Salt, Turner's-road, Limehouse (accepted)	1,472	0	0

For the erection of addition to infirmary, new swimming-bath, and girls' play-hall, Stockwell Orphanage. Mr. A. Wright, architect. Quantities by Mr. J. Goodchild :—

Hart	£3,497	0	0
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Croaker, Bros.	3,043	0	0
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For Plaistow Vicarage, Bromley, Kent, for the Rev. W. Hodgson. Mr. W. R. Mallett, architect :—

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Grubb	2,903	0	0
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Balding (accepted)	2,575	0	0

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J. Page	1,129	0	0
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F. Higgs	1,083	0	0
M. Gentry	995	0	0
J. Garrud	993	15	0
W. J. Beale	957	0	0
G. Parker (accepted)	949	0	0

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The Builder.

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*Yriarte's "Florence."**



LORENTINE architecture presents a singular blending of different elements and of different kinds of interest. Most of the principal architectural monuments of Florence seem to form more or less examples of the fusion, or of the employment simultaneously, of elements belonging to both Classic and Gothic architecture. But this dual character is exhibited in the city at large, to some extent, as well as in individual buildings. If we compare the Palazzo Vecchio and the Campanile, for example, which are two of the most typical, as well as most important, structures in the city, they seem like architecture from two different quarters of the earth. No one on the mere inspection of drawings of the two buildings, would imagine that they were separated only by somewhere about 300 yards in space, and by about thirty years or so in time. Indeed, there is even a very close artistic connexion with them, since the Palazzo is attributed to Arnolfo di Lapo, the architect of the Duomo, which latter gave at least the key for the style of the Campanile. The two buildings are a kind of contradiction to the position maintained by so many of the Gothic revival architects in this country, that there could not be one style of architecture for one thing and another style for another thing; a Gothic which should be a church style, and not a domestic style. The architect of the Palazzo and the Duomo, at any rate, had two distinct styles, and worked both of them with a considerable measure of success, though the designer of the Campanile cut him out in the more ornate cathedral style, and threw the cathedral into the shade. But the Palazzo Vecchio is a grim memorial of the state of turmoil from which the Florence of the Medici and of the great Florentine period of art emerged. It is a building, externally at least, for grim use, for defence and retreat; its lower story is nearly solid, pierced only with small grated windows; its upper story overhangs portentously over huge machicolations, and even sterner effect is produced by the tower rising from the line of the machicolated story, and overhanging the lower part of the building. Hardly any building could be named which is more historically significant than the Palazzo Vecchio. Standing in the midst of the city which is the Athens of the modern epoch of the world, and which is full of artistic beauties of every kind, and was the headquarters of the refined and cultured dilettantism of the Renaissance, this stern pile of building seems like an ominous record of the fiercer times which preceded the development of Florentine art. The internal architecture of the palace has much refinement and beauty, such as might well go with the same age which created the Duomo and its Campanile; but externally it is a building emphatically denying all sympathy with culture or with the train of associations for ever interwoven with the name of Florence.

The contrast between this stone fortress and the architecture of the Campanile is the most marked that there could be. The fortress represents that quality of Gothic architecture which has been regarded by some Gothic revivalists as representing the essential characteristics of Gothic architecture,—that which almost ignores all decoration except such as arises out of the construction. It has much of that character which Ruskin has happily designated "wolfish," and which some architects, following in the steps of his teaching, have endeavoured to realise in the erection of buildings for modern purposes with the aspect of feudal castles. The Campanile is the frank reverse of all this. It must be classed as Gothic, but it wants nearly all the elements most essentially characteristic of true Gothic architecture. There are no massive buttresses, no bold display of construction; the one feature that is in unison with true Gothic feeling in it is the bold machicolation of the cornice,—bold in scale and proportion, though treated with very delicate ornament in detail. For the rest, the Campanile is almost like goldsmiths' Gothic, as one might say. It wants one of the most necessary elements in architectural design which nearly all Italian towers want, that spreading at the base which is so essential to give the appearance of monumental stability. It is, moreover, entirely an architectural facing, not a real piece of building; a recollection which must always be an annoyance in our contemplation of it. But yet there is no question that the Campanile fascinates, and has fascinated, all who have looked at it. Even those who condemn it on stern grounds of architectural truthfulness do so lovingly, and as if they could not escape the charm of it. And the secret of this is, that in spite of the objection we naturally feel to a merely veneered architecture, there is in the Campanile the display of a highly-refined artistic taste and organisation. It is not in a perfectly pure and homogeneous style, it does not represent the best and most solid manner of building; but it is a design in which every portion is accurately balanced and proportioned to the whole, and in which we see the application of classical refinement and finish applied to what in the main are Gothic details. The lesson of the Campanile in this respect is a very important one. It shows that, in spite of the inherent architectural weaknesses of style and construction which it exhibits, this carefully-considered refinement and proportion of parts will have a lasting effect in compelling admiration for the total result,—that the aim after the forcibly picturesque, in an unsystematically designed building, may be often a delusion, leading the designer away from the qualities in architecture which will most strongly assert their pre-eminence in the long run. In short, the Campanile is a *design*, not a mere *pile*; and architecture, as pursued by men of cultivated tastes, should have that quality. Among recent modern Gothic architects in this country there is a taste for piling, and it is singular that those who will express high admiration for the refined and studied design of the Florence Campanile will themselves illustrate a totally opposite theory in their own buildings by putting up towers and other masses of building in a way that suggests no study except how to avoid the appearance of study. Such buildings will please as long as the forced taste for irregular piling lasts; but when it passes off, as every forced taste of the kind is sure to do sooner or later, there will be little left to command the admiration of future generations. The defects of the Campanile design, in addition to that inherent defect of want of solid construction, are that the tracery is rather clumsily treated in detail (but this is only apparent on a very close examination), that the twisted columns springing from projecting brackets are not truly architectural in their relation to the whole, and look rather too much as if affixed for the purpose of ornament, and that the tower has never received its completion. Of this latter fact few of those who admire it are aware; though we have found a rather general consensus of opinion among amateurs that it "looks unfinished." Considering how almost universal is the completion of the straight-lined Italian Campanile with a lantern and spirelet, it is astonishing how blind even architects seem to be to this incomplete state of the Campanile, even supposing that they are unacquainted with its history. M. Yriarte alludes to the fact, mentioning that Giotto had intended to terminate the square by a pyramid, as in the Campanile of St. Mark, at Venice, but that his successor Taddeo Gaddi had suppressed that addition. It may be observed that there is a certain doubtfulness as to the actual authorship of the design, some of the most learned Italian students of architectural or of Florentine history regarding Giotto's connexion with it as a myth; but they none of them express any doubt as to the fact that it was not intended to have its present abrupt termination. In fact, the carrying over of heavy machicolation with nothing further is a device proper rather to military towers than to such a piece of purely decorative architecture as this. It

* Florence. L'Histoire—Les Médicis—Les Humanistes—Les Lettres—Les Arts. Orné de 500 Gravures et Planches. Deuxième Edition. Par Charles Yriarte. Paris: J. Rothschild, 13, Rue des Saints-Pères. 1881.—See p. 475, *ante*.

may be doubted, however, whether a heavy pyramidal roof like that at Venice would not rather overweight the delicate design of the substructure, so different from the nearly solid mass of the Venetian tower.

The Duomo itself does not stand nearly so well, as an architectural design, as the Campanile. In the portion of the church which was designed by Arnolfo di Lapo, previously to the Campanile, the faults of the style, its flatness and constructive weakness of effect, are much more apparent, both proportionately to the mass and absolutely; for the Campanile shows considerably more relief of surface than the immense mass of the cathedral walls. The Campanile is the work of a man of superior genius (whether it were Giotto or not), improving upon the details of the church. The illustration we give from the exterior of the church* is one given by our author more for sculptural than for architectural reasons, to illustrate the sculpture in the tympanum, "La Madonna della Cintola," which M. Yriarte ascribes to the hand of Jacopo della Quercia; resting, as far as we gather, entirely on the evidence of the style of the work itself, in the absence, as he says, of any document affirming other authorship. It has been traditionally assigned to Nanni di Banco. We may be allowed to feel sceptical as to conclusions based in such a case on merely internal evidence, and it would hardly be worth while either to concede or to contest the point. The illustration serves, however, to draw attention to some of the points in the architectural detail; the rich treatment of the archivolt of the doorway, which in its succession of well-marked and bold mouldings is in curious contrast with the exceedingly flat and even tame treatment of other portions of the detail; the very Classic character of most of the foliage decoration, especially the running scroll-work in one of the broader members of the archivolt, so different from anything that is found in Gothic buildings anywhere but in Italy; and the bad and rather trumpery taste of some of the inlaid ornaments, especially the absurd ornament of the wide band running round the sculpture panel in the tympanum: this, fortunately, is too subordinate to injure the total effect, but it is an example of the lapses of taste which are found in the detail of the Duomo, and in a lesser degree in some of that of the Campanile. For the dome, M. Yriarte expresses a greater degree of admiration than we are able to allow. He says of it, "*Elle dépasse en audace et en harmonie tous les monuments de l'art moderne.*" The great claim of Brunelleschi to admiration is in his thoroughly workmanlike way of building; he alone of those who wished to construct it knew what he was about; it is an eminently well-built dome, and has additional interest in the fact that it is an almost solitary instance of the application of the dome on a large scale to what may, on the whole, be regarded as a Gothic building. But as a piece of design it cannot be so highly praised; the base of the dome is weakly treated, and the lantern is a poor design in itself, and is clumsily joined on to the apex of the dome. The shade of Brunelleschi must rest content with engineering rather than architectural honours.

In commenting on San Miniato, M. Yriarte observes that the constant use of an inlay of coloured marbles, so prevalent in Florence, arose naturally out of the usual tendency of the builders of whatever neighbourhood to make use of the materials readily available in that neighbourhood. The environs of Florence were rich in coloured marbles of different kinds, and hence the temptation, when prosperous times and days of high culture set in, to make use of such materials largely in order to produce a rich and sumptuous effect. It would perhaps be unreasonable to complain of an exaggerated use of a special material when it has resulted in the creation of almost a special class of architectural design peculiar to the Florentine district; otherwise we might say that the Florentine architects would have produced a more monumental and more strictly architectural effect if they had restricted their use of these marble inlays to the less constructively important portions of their buildings, marking the construction by plainer and more massive materials. The front of San Miniato is, of course, entirely altered from its original form by this addition of incrustations in a later day; the old basilica, in fact, underwent successive changes in the course of generations as one artist after another brought his contribution to it. As M. Yriarte says, happily this was in the great age of Florentine art, and the basilica could hardly but benefit by any additions made to it in such an age; but it may be questioned for all that whether the variegated panelling of the façade does not rather clash with the simple outlines of the old building. In Santa Croce, another of the works of Arnolfo di Lapo, and in style a simpler edition of the style of the Duomo, the treatment of the front is remarkably satisfactory and harmonious, but there is all the difference between a building designed from the first in this style, and a building of an older date and simpler style, to which the polychromatic decoration has been added. Byron has familiarised every reader with a portion of the peculiar claims to interest possessed by this church,—

> "In Santa Croce's holy precincts lie
> Ashes which make it holier";

those namely of Michelangelo, Galileo, Machiavelli, and Alfieri; the tomb of the latter was the work of Canova. When Byron wrote, Dante had no monument in "ungrateful Florence," a fact which inspired the poet with two of the best stanzas of "Childe Harold," but his monument is now among those of Santa Croce, by the sculptor Étienne Ricci. M. Yriarte remarks in a melancholy tone on the inferiority of these two modern monuments to the older ones. "Comparing them to the monuments of the fifteenth century and those of the Renaissance, of which Florence possesses such prodigious examples, these tombs are of an inferiority so marked that '*on fait un retour sur soi-même*,' in asking how it is that the source of genius can have been thus drained so as to dry up so green and verdant a tree as that which had flourished in the Tuscan soil. It is not only at Florence that one experiences this feeling; at Venice already, in the marvellous church of Santa Maria Gloriosa dei Frari, when we see, by the side of the tombs of the Doges and Condottieri of the fifteenth century, the miserable monument on which the great name of Titian is inscribed on a singular pyramid of marble, we cannot refrain from some sad reflections. There is evidently a fatal law to which humanity has to submit; genius is born, grows, develops itself, and covers the whole earth with its shadow; then, little by little, the sap recedes from the growing trunk; the tree produces fruits less savoury, flowers less beautiful, the branches finally wither and the tree is dead." A remark which falls in curiously with one at the close of a paper on art, printed in our last number. M. Yriarte might have added that it is useless to devise mechanical means for propping up the tree when it is dead.

Another phase of Florentine architecture is illustrated in what is in some respects one of the most remarkable bits of architecture in the city, the Loggia dei Lanzi, the design of which is ascribed to Orgagna. The peculiar interest of this arcaded space (apart from the works of art which are placed under its shelter), lies in its singular combination of Gothic and Classic feeling. The grouping of the pilasters which combine to form each pier is a feature essentially Gothic; the treatment of the arches in receding faces is also Gothic, but the arches are circular, and the general effect of the arcade is certainly Classic rather than Gothic. It combines in a rare degree lightness and grace with sufficient massiveness. Then the cornice terminates in an open balustrade distinctly and completely Gothic in character, and carried on trefoil Gothic arches, but these trefoil arches spring from a row of Classic cantilevers. The combination is one of the most peculiar in architecture, the more so from the double form in which it occurs; in the lower portion a fusion of Gothic and Classic elements is seen, Classic forms being used in a Gothic manner; in the upper portion pure Classic and pure Gothic details are used in juxtaposition. This finish certainly clashes with the lower portion, and looks as if designed by a different hand.

We remarked on the extraordinary contrast between the style of the Palazzo Vecchio and that of the Campanile, and the reminiscence of the turbulent times of Florence which survived in the stern walls of the former. But this contrast in Florentine architecture reappears when we come to the rise, in the Renaissance period, of that style of palatial architecture which is so marked an element in Florence, and which has exercised so strong an influence on modern architecture of the same class in other countries. If we take such a building as the Riccardi Palace, we find here an architectural style quite different in expression from the stern and grim style of the Old Palace, but also as completely opposed as possible to the delicate but superficially constructed architecture of which the Campanile is the finest type. Here there is no veneering, but the most solid and massive construction; very little ornament, the effect being chiefly produced by the disposition and the simple decorative treatment of the windows, by the use of a stronger rustication in the lower story of the masonry, and by a powerfully proportioned horizontal cornice which dominates the whole. In this particular example, the Riccardi, there does seem to be a certain degree of the same influence which gave expression to the architecture of the Old Palace; for the basement story of the Riccardi retains some of that fortress-like aspect which naturally arises in habitations built in turbulent times. The lower story seems adapted for defence, the upper stories for habitation. This distinctive treatment of the lower story becomes less marked in others of these Florentine palaces; in the Rucellai and Guadagni palaces the plain and massive treatment of the lower story is retained, with small and insignificant windows, but with a much less fortress-like aspect than in the Riccardi; in the Pitti Palace this distinction of the lower story is not observed at all, and the general character is the same throughout. The larger of these palatial structures are notable examples of the effect that may be produced in architecture by exceedingly simple and broadly treated masses of building, well proportioned, and, to a certain extent, varied in their different stories, and built in the most massive and monumental manner. It is in this latter fact that great part of their effect resides. There is nothing little or scamped about them; they are built as if to last for centuries. In this respect they afford as marked a lesson in one way as the Campanile affords in another way. The latter shows what can be done by great delicacy and profusion of detail, carried out with great finish and refinement. The palaces are examples of the effect to be obtained by solid, massive, honest building, reticent in regard to decoration, and designed in a manner perfectly dignified and unpretentious, and precisely in accordance with the object for which they were built, to provide city dwelling-houses on a grand scale.

We cannot, however, pursue the subject farther in detail. In reference to the second of the two illustrations we are enabled to give this week,* we may observe that it also, like the other, is taken from the portion of M. Yriarte's book which is devoted to Florentine sculpture, representing, as it does, a feature which is decorated with one of the best and most characteristic designs of Donatello, the sculptured groups of children in the panels. These groups are given in an enlarged form on another page of the book. The interest of the illustration showing the whole design is, however, rather architectural than sculptural, as it is an exceedingly good example of a class of objects common in Italian churches. This particular example is included in M. Yriarte's work as among specimens of sculpture by Florentine artists; it is not in Florence, but is built out of the south-west angle of the cathedral of the small town of Prato, about eleven miles from Florence. It was built for the periodical exhibition of a celebrated relic, the sacred girdle of the Virgin, and hence it was considered a worthy object for the exercise of the great Florentine sculptor's genius in supplying the carved panels. On the picturesque design of the pulpit as a whole it is unnecessary to dilate. We may observe that here again is the admixture of Gothic with Classic feeling so peculiarly characteristic of Florence and its neighbourhood; the thick angle column carrying the umbrella-like canopy is decidedly a Gothic feature; but the lower portion is decorated with miniature pilasters, and carried by Classic cantilevers.

In addition to the numerous engravings of buildings, pictures, statues, and portraits, the book is farther beautified by the reproduction, in fac-simile, of a number of Florentine book ornaments, which surround the titles of the various chapters, and are exceedingly characteristic and beautiful specimens of Florentine taste in these minor forms of adornment. The illustrative department of the book is throughout excellent, and carried out on a most liberal scale, the whole making a beautiful and sump-

* See p. 518, *ante*.

* See p. 519.

tuous volume on one of the greatest and most fascinating periods of artistic history, and such as will be a valuable, and indeed almost essential, addition to every good library.*

EFFECTS OF LIGHT ON STAINED WINDOWS AND ON SCULPTURE.

Sir,—Happening to be in London on the 8th inst., when, as you may remember, an extraordinary darkness occurred in the morning, which spread over many miles of country, and which in some places,—the neighbourhood of Sydenham, for instance,—required the lamps to be lighted, one or two effects of light occurred to my observation, which, perhaps, you may think worthy of putting on record.

The first of these was at Westminster Abbey. Finding, in spite of a thirty miles' run to town, that I was too early for a person I wished to see at Westminster, I economised the time by a visit to the Abbey. The morning service was going on, the candles in the choir being lighted, as at evensong in winter. When a glorious burst of music from the organ had signalised the close of the service, and the departure of the clergy from the choir, I walked round the familiar and venerated aisles. But I was in a new region, or rather was transported back in time by five or six centuries. It was not at first apparent to what this effect was due,—and you will allow that the explanation is not only interesting, but comforting. I am not sure how far you agree with those *laudatores temporis acti*, who have been heard to express a wish to fill their pockets with pebbles, and discharge the contents at the rose-windows of the transept. I confess to having entertained a wish so to do myself. But no such wish crossed the mind on that gloomy day. The effect of the low atmospheric illumination on the windows was like that effected by age. So much less light than usual was transmitted, that what actually reached the eye had that "dim religious" tone in which many of us think that these windows are deficient. The north transept window, especially, looked like rich antique glass, and the small lights below it looked like the very earliest window jewelry. The memorial windows to our three great engineers,—Stephenson, Brunel, and Lock,—were remarkably rich in their effect, casting a sort of glow-worm lustre, so that they appeared rather as something visible by their own light than as sources of evident illumination for the interior. The effect of the whole was wonderfully fine. Not only so, it leads to the hope that when the London atmosphere shall have anticipated the chemical action of centuries in roughening and dirtying the external surface of the glass, the windows of the Abbey will have lost any approach to what may be called either tawdriness or glare, and the glass-workers of 1880 will be promoted to a higher place among the fathers of the art than criticism has yet accorded to them.

The other experience was at South Kensington. How far it may be due to the darkness of the day, and how far to the vertical lighting of the lofty hall to which "David" and other large pieces of sculpture have been removed from the north court, I cannot say; but I confess that I was startled by a legacy of recently departed genius. You know, sir, that if I have a passion for anything, it is for noble sculpture; that I have sculptor's blood in my veins, and that the chisel is not unfamiliar to my hand. And my study and criticisms of the art have not led me to put John of Bologna or Benvenuto Cellini on the same level as Pyrgoteles, or Polycletus as high in the scale as Phidias. But when in that light, not very bright, but skilfully cast down, I looked on two groups by Alfred Stevens which I had *not* altogether admired at St. Paul's, a kind of awe came upon me. "The mantle of the Florentine," I said half aloud, "has been cast on the shoulders of Stevens." There is a little of the rich delicate grace of John of Bologna, there is a trace of the elaborate elegance of the "Eloquence" of the Argyle monument; but there is the breath of Michelangelo in these groups. They were two,—casts of the original models,—for the tomb of the Duke of Wellington: "Courage and Cowardice," and "Truth and Falsehood." I had never quite understood how it was that I had not admired them more in St. Paul's. The modelling is undeniably fine, the design masterly, the action energetic, but not overstrained. I had also, I think in your pages, made complaint of the villainous lighting of the whole composition, as crammed into a sort of cell in which there was no room for the artist to turn himself round. But I had not before put two and two together, nor duly realised how the noble genius of Stevens had been stifled and smothered,—at least as to the effect produced by its children,—by the usual foe and victor of the sculptor, bad illumination. I went a step further. I thought, what will the editor of the *Builder* say if I express the opinion that these figures of Stevens, if lighted in the same way, need not blush to find themselves side by side with the creations of Michelangelo? And lo! as I pondered, stood before me the awful forms that watch over the Medicean tombs. In the corner of the large hall were two packing-cases, the front or lid of each of which had been removed, and the figures within,—casts of the two chief figures on the tombs,—with a back-ground of straw and packing, received a light even more restricted in its direct incidence than that which fell on the groups of the English sculptor. The shadowy awe, of which Byron has so well spoken, that broods beneath the helmet of the pensive seated figure, seemed as if spirit dwelt within the form. It was impossible for these two masterpieces of Michelangelo to be seen under a more impressive and well-adapted light than that which thus casually fell upon them. I gazed at them with reverence. But I did not retract my opinion as to the kinship of the genius of Alfred Stevens.

Let me ask you, and ask all those who love art for the sake of art, and who seek to master her hidden secrets, not for the sake of criticism, but for that of instruction, to give more careful heed to this question of illumination. The sculptor is a fellow-worker with the sun. Take away the light, and where is the form? Concentrate the light in as small a pencil as possible; direct it from above, and treat it by shadowy projections,—the wings of Medusa, the cap of Hermes, the helmet of Mars,—and you have a closer approach to life than painting can render. Ay, and to an imaginative, spiritual life, nobler than that of the busy world around. Put the same figure in an open square, or in a room with ordinary windows, and you have—a piece of stone-cutting. Who cares to look at the Shakspeare of Roubiliac, executed for Mrs. Garrick, and for which Garrick himself stood as a model, in the corner of the British Museum in which it is stowed away? Some little time ago I was at Oxford, where I was shown, I think in the ante-chapel of New College, a beautiful relief in memory, if I am not deceived, of Sir W. Jones. But the relief was so lighted as to look poor, thin, and mean. It was between two cross-lights, and placed without any reference to the proper illumination of the sculpture. I said to the authority who showed me the place, "I think that is a fine piece of work; but I am sure you have never seen it." Whether I was thought a little mad or no I cannot say; but I was allowed to open a door so as to cut off one set of rays of light, and have the relief illuminated from a single direction alone. "Now," I said, "did you ever see it before?" "No, sir, I certainly never did," said the verger. It had been seen before as lighted by the mason. It was then seen as it had been lighted by the sculptor.

I must ever regret missing the opportunity of seeing the Wellington figures in the studio of Stevens. You, sir, no doubt did see them, and you can, perhaps, say how they were illuminated there. I do not say that it is impossible to illuminate sculpture better than with what I may call its native light. Torch-light, for instance, makes some sculpture look far finer than day-light. If I had time for the work of the studio, I should try the effect of a figure wrought and to be seen only by torch-light. The story of the candle, that Michelangelo fixed in his cap, serves to hint at something of the same kind. I hold that it is absolutely certain that to produce anything in sculpture that deserves the name of the grand, the light might be restricted to a certain incidence during the whole time of execution, and the figure must be seen by the same, or by some equally restricted, light. The difference between a figure at Madame Tussaud's, and the Newton, in Trinity College Chapel, Cambridge, is palpable. But it is quite possible so to illuminate an inferior work of art, even a wax mask, and so to disfigure a noble sculpture by a flood of incongruous light, as to confuse the very primer of excellence. "Let there be light" is the fiat of art. "Let there be the true light" is the main secret of the sculptor. C.

* We willingly go a little out of our way to mention that the French publisher has appointed as his agent for England Mr. Charles Davis, 47, Pall-mall.

A PLEA FOR THE INDIAN PUBLIC WORKS DEPARTMENT.

The members of the Indian Public Works Department are now so widely spread that a few notes on two papers referring to them, recently made public, will, doubtless, be of interest to many of our subscribers. The first is an elaborate and carefully thought-out minute by Sir Andrew Clarke, R.E., K.C.M.G., late Minister for Public Works in India, and previously well known in this country in connexion with the Portsmouth Dockyard and other works, and from his being on the council of the Institution of Civil Engineers. He reviews the past history of the Department, and though he knows the discontent to have been long standing, and appears to consider the members of the Department to have good grounds for their dissatisfaction, he states he has observed "no disloyalty to Government" on their part in pressing their claims on his attention. He reviews the difference betwen their pay and pension rules and those of the Civil Service and the military officers employed, and instances one or two in which the present rules press very heavily on the civil officers, and, in fact, says, "the whole tenor of this section of the pension code shows that it was never intended to be applied to an establishment like that of the civil engineers of the P.W.D." It was a necessity of a service now quite obsolete, and when framed no one considered that it would be eventually applied to the class it now includes.

Sir A. Clarke points out the present prospects of the Department, and the work it will be called upon to perform, and concludes that at least 100 engineers would have to be retired on suitable pensions, which should be a special grant to meet the unprecedented case. He suggests that those retired should go voluntarily, especially so as regards the class known as "Stanley Engineers," as they could not be retired compulsorily, but that to all cases the permanent benefit to the Department as regards efficiency should be considered rather than "the desire to save in one item of the civil estimates." It appears from one of his statements that, whereas the Royal Engineers, with between twenty and thirty-two years' service, can get pensions ranging from between 166*l.* and 416*l.* per annum, which they can claim voluntarily, and have in addition the prospective benefits of a possible 1,125*l.* per annum, after thirty-eight years' service, the civilian can only get between 166*l.* to 416*l.* in the same time, and then only on the production of a medical certificate stating his incapacity to serve any longer, should his service be under thirty years.

Since the minute was written, and since he left India, over 300 engineers have been dismissed the service, the retirement of fully four-fifths of this number being anything but voluntary, whereas all that has been done with the Royal Engineers branch of the Department is to allow two years' holiday on farlough pay to those who wished it, a boon which, had it been offered to the civil branch, would have been eagerly accepted by many.

Sir Andrew Clarke concludes his minute with a reference to the Roorkee and Cooper's Hill Colleges, and to the Stanley Engineers, the latter of whom, he says "stand first in the order of utility," whereas of the Cooper's Hill men he states that for some time after joining they "are very little use indeed." Why is this?

The second document referred to is "A Return made to the House of Lords on the motion of Lord Belper, of annual expenditure and receipts of Cooper's Hill College, &c., dated 25th July, 1881." From this it appears that out of 450 students in ten years, 299 have gone to the Public Works Department, and that the cost of their education, &c., has been in round numbers 198,000*l.*, to which a sum of 47,000*l.* odd must be added on account of ten years' simple interest at 4 per cent. on 119,076*l.*, the original cost of Cooper's Hill College Buildings, making a total of 245,000*l.* The college has received fees, &c., to the amount of 149,000*l.* odd. The ultimate burden on the Indian estimates being for ten years 96,000*l.* odd, or at the rate of a little over 320*l.* per assistant. These figures appear large

and it is questionable if the result is commensurate with the expenditure. Sir Andrew Clarke in the minute above referred to states that he could not find that the opinion of the Government of India was ever asked for in the matter, and the time now appears to have arrived when it should be decided if the already modified College system should or should not be continued.

Some of the suggestions made by him have been carried out; for instance, the Military Works Department is now officered entirely from the Royal Engineers, but nothing whatever has been done to fill the Civil branches entirely with civilians, or by a proper proportion of civilians to military. We think that in these departments the higher grades should be filled by promotions in proportion to the total number of civil or military engineers respectively.

We also have been led to think that some such rules should be laid down as are said to exist in the Swedish service, where civilians and military men are all paid alike, one consolidated rate, and that as regards retirement and pension rules they should be the same as for all other covenanted civil servants of the Government of India.

Both minute and blue book will repay careful perusal by all who are interested in the matter.

THE SAFETY OF THE CHURCHES OF EAST ANGLIA.

The Honorary Secretary to the British Archæological Association, referring to the inquiries made, without eliciting reply, by the *Builder* as to the existence or otherwise of a lightning conductor to the church of South Wootton, Norfolk, recently much damaged by lightning, reiterates his former warnings as to the danger to which the churches of East Anglia are exposed by the neglect of this necessary precaution. Norfolk and Suffolk, as Mr. Loftus Brock justly remarks, and as all familiar with those counties are aware, are distinguished for the number, beauty, and lofty and conspicuous sites, of their church towers. "They answer, so to speak, one another from hill to hill, and fulfil in many respects the *beau idéal* of a church in relation to its prominent position in a landscape." The churches inspected in 1879 during the Congress of the British Archæological Association at Great Yarmouth are estimated by Mr. Brock at the money value of 200,000*l.*; which is a mere trifle in comparison to their historic and architectural value.

The livings being usually poor, and the country agricultural, the aid that is usually now so freely forthcoming on any appeal in support of the fabric or the service of our churches is more scanty in East Anglia than in richer parts of England. But the occurrence of damage from storm is thus all the more to be deprecated. On the simplest principles of ecclesiastical economy we hold that those concerned for the welfare of the Church will do well to listen to the warning, and not to listen alone, but to give the remonstrance the solid echo of their subscriptions. For ourselves, we put the matter on a higher ground than that of cost. No money can replace a grand old monument. The new churches, we are happy to hear, are so far secured in that respect that the application of a lightning conductor is made a *sine quâ non* for the granting of any aid from the Church Building Societies. But better be damaged half a dozen new churches than one old one. Not that the former mischief is not to be deprecated,—but it is at all events reparable. The other may be irreparable. In our review, some time back (vol. xxxviii., p. 20), of Mr. Richard Anderson's excellent work on lightning conductors, we cited the long list, which occupies eleven pages of royal octavo in that book, of the damage done to churches and other public buildings by lightning in the last and in the present centuries. Many of the instances are taken from our own columns. At the same time there can be no doubt that this long list very imperfectly represents the number of lightning strokes that actually occurred. There has been a lull in the destructive activity of the lightning, of late,—due, we think, probably, to meteoric causes, rather than to the effect of protective conductors. If so, we may at any time find we are entering on a cycle of thunderstorms. The escape of any building, or any set of buildings, unprotected by conductors, for a number of years from damage by lightning, affords no pledge for their continued security. Cromer Church, in Norfolk, which had the pinnacle slightly damaged by lightning in August, 1879, is the last case cited by Mr. Anderson. Will the British Archæological Association accept the advice that by calling on their members to supply all the information attainable by each of them as to the injury of public buildings by lightning, in their several localities, and by issuing an enlarged edition of the list commenced by Mr. Anderson, they may do good service to the cause they have at heart, and call the attention of all those who love old English churches to the need of protecting them from the thunderbolt? We shall willingly print any such list.

BUILDING SOCIETY RETURNS.

In pursuance of an order of the House of Commons of 25th February last, the Registrar has issued an abstract of the accounts furnished by incorporated building societies, which is the sixth return presented since the passing of the Act. It contains the names of all societies, now existing, that were incorporated prior to the 1st of January, 1881. The societies in the list number 1,321, of which 1,163 have made returns. Of the 115 which have not made returns, 94 are either in course of winding up, or have not yet completed a year's financial arrangements, so that only 22 are defaulters. The receipts of the companies are:—

	No.	Receipts.
England and Wales	1,115	£18,694,555
Scotland	48	625,225
Total	1,163	£19,329,780

These totals show increased receipts of 2,277,333*l.* for England and Wales, and of 11,012*l.* for Scotland, since the last return. Out of the gross total, nearly 11,700,000*l.* stand to the credit of 63 societies, leaving the balance of 7,600,000*l.* to be shared between the remaining 1,100. There are 35 societies of which the receipts exceed 100,000*l.* each, rising from that sum to 923,277*l.*; 28 societies exceed 50,000*l.*, and are under 100,000*l.* The liabilities are,—

Ordinary shares	£21,493,814
Preferential	1,554,159
Depositors	14,183,678
Total	£37,231,651

The assets are,—

Mortgage securities	£36,011,383
Other securities and cash	2,213,978
Total	£38,215,361

It is well that all the security which official inspection can supply should be afforded to these useful associations. The advantage which an association possesses over an individual, in the way of amassing money, is chiefly derived from the facilities possessed by the former of investing their income the moment it comes to hand, so that, in fact, they come very close to the receipt of compound interest, as that extraordinary offspring of civilisation lives and grows upon paper. And the working man who puts his weekly shillings into a sound building society is actually ensuring the benefit of this wonder-working compound interest. Then we must remember the vast difference made by enlisting human nature on the side of economy and prudence. Loose cash wears out the pockets. It is well said to burn holes in them. It is so easy to change it for beer at the public-house, and the worst of the change is, that while the cash preserves its individuality wherever it goes, and does its duty as a medium of exchange whenever it is called on,—the beer does not. It disappears,—no more to reappear. Sometimes in disappearing, like coal that is burned under a boiler, it does good work. As often, we fear,—if not more often,—it does more harm than good. If the magic wand of some great master of fiction were to represent to the English workman how many a cottage could be built, in how short a time, out of the pots of beer which he did *not* drink,—we think it would give an impulse to building societies. Here is a little calculation which we made the other day *apropos* of the plan then proposed, which has since fallen through, in Germany as to a State insurance of the life of the working man. It would be far better for him to insure for himself. The difficulty has been how he could do so. The building society supplies the method. And let it be remembered that what we now say of a penny a day will have to be trebled if we substitute the words pot of beer for the word penny.

A penny a day is 1*l.* 10*s.* 5*d.* a year. Neglecting the odd pence, if an individual were to lay by a penny a day from the age of twenty to that of seventy, allowing the hoard to accumulate in an old stocking, or buried in a hole in the earth, the sum would amount to 75*l.* at the end of the fifty years; and if the depositor died during the time, the deposit would be in exact proportion to the number of days during which the deposit had been carried on.

If a similar accumulation had been allowed to take place with pounds, or larger sums, instead of pence, it is obvious that the depositors might have made a much better use of their savings than to bury them. Invested in houses, in land, or in trade, the capital would have been living instead of dead, and would have earned an annual return. If this return had been at the rate of three per cent., the 75*l.* would have increased to 112*l.*; if it had been at the rate of five per cent., it would have amounted to 209*l.*

LABOURERS' DWELLINGS IN DUBLIN.

At a recent meeting of the Dublin Corporation, Mr. E. Dwyer Gray, M.P., moved the adoption of the report of the Public Health Committee *in re* the adoption of the Labouring Classes' Lodging-houses and Dwellings Act (Ireland) 1866, 29 and 30 Vic., cap. 44. The Committee reported:—

"1. That the Labouring Classes' Lodging-houses and Dwellings Act, 1866, is applicable to Dublin, and that it is highly desirable that it should be put in operation.

2. That the Oxmantown Estate, and possibly portion of the property which may be purchased by the Corporation for the purpose of the new street to the Swivel Bridge, afford convenient sites and occasions for a commencement.

3. That there are very many vacant spaces in Dublin, especially those reported on in the annual report of Dr. Cameron for 1880, which might be purchased on reasonable terms, and upon which dwellings might be erected with great advantage.

There are many hundreds of houses in Dublin in an utterly unsanitary condition, as your committee have frequently reported, and which your committee would take more stringent steps to close if they did not, as they have also reported, fear that the consequent overcrowding other dwellings might result in greater evils than those now existing."

Mr. Gray said it was now proposed merely to pass a preliminary resolution notifying to the ratepayers that the Corporation intended taking the matter into consideration on a particular day, and he would suggest Monday, the 7th day of November. There was no reason why this undertaking should not be attended with success. They had the example of the Artisans and Labourers' Dwellings Company in Dublin before them, and that undertaking paid four per cent., dividend. He saw no reason why this other undertaking should not also pay close on four per cent., so that by spending 100,000*l.* or 200,000*l.* on it, it would not mean that the interest would be saddled on the ratepayers, but that the undertaking might be made self-supporting. He confessed he was of opinion that the Corporation should not become extensive landlords, and it would be only as a last resort that he would recommend them to engage in any extensive building speculation, because he did not think that the Corporation or any public body could be good landlords, and their experience of their Baldoyle tenants had been that building was not very remunerative. However, the work was one which should not be shelved. In connexion with this undertaking they contemplated providing rooms for single women of the poorer classes at low rates; for he believed that no class required the protection of the public authorities more than these poor, industrious, struggling women. He moved a resolution to the effect that public notice be given of the intention of the Council to take into consideration the propriety of adopting the Labourers Act for Dublin, and that the Council would take it into consideration at a meeting of the Council on Monday, the 7th of November, at one o'clock.

The motion was adopted.

This subject was also discussed in the Health Department of the Dublin meeting of the Social Science Congress, where

The Recorder of Dublin read a paper, in the course of which he stated that the supremacy of the death-rate in Dublin lately compelled the speeding of a Royal Commission, and the very able report of the commissioners, Messrs. Rawlinson, C.E., and MacCabe, of the English and Irish Local Government Boards, unhesitatingly attributed this evil state of things to the condition of the houses of the poor. Previously to this report the Recorder had addressed the Lord Mayor on the supremacy of the city crime rate, attributing

this also to the social condition of the poorer classes within their homes and in the streets outside. The author urged the reparation and reconstruction of the various statutory powers already existing under general Acts, rather than seeking to deal with this ancient and diversified city upon any single or special plan. These statutory powers came under the heads of,—1. Provisions relating to cleaning of entire civic areas; 2. Those relating to the reparation of individual houses; 3. Those relating to the provision, by civic authority, of houses for the working classes. The work of improvement has a tendency to raise rents, and therefore to create a residuum of the very persons who are most difficult to deal with, and yet most need remedial measures. In the work of reparative reform the duties of corporations, owners, occupiers, and magistracy, are correlative and reciprocal, and each without the other vain. The author expresses his conviction that the urban grievances which now call for redress are more urgent than those rural claims which have monopolised public attention.

Dr. Charles A. Cameron, M.D., S.Sc.C., Cambridge, Fellow and Professor of Hygiene, R.C.S.I., Medical Officer of Health for Dublin, read a paper on the question, in the course of which he referred to what had been done in the way of erecting dwellings for the labouring classes in a number of towns in England and Scotland. He stated that the loans advanced under the Artisans' and Labouring Classes' Dwellings Improvement Act up to March 31, 1880, were:—for England, 1,419,970*l.*; for Scotland, 115,000*l.*; and for Ireland, 30,500*l.* Under the provisions of the Labouring Classes' Dwellings Act the loans raised in England and Scotland amounted to 394,741*l.*, and in Ireland to 66,634*l.* The Corporation of Dublin have put in force the provisions of the Artisans' Dwellings Act. They have completely cleared away a collection of dwellings situated under unhealthy conditions, at a cost of 22,000*l.*, and they have let the cleared site to the Dublin Artisans' Dwellings Company at a rent of 1,200*l.* a year. Another unhealthy collection of dwellings is being cleared away at a cost of 150,00*l.* A report, in which I have advocated the erection of dwellings for the lowest and most dependent classes of the population by the Corporation of Dublin, has just been unanimously adopted by the Public Health Committee; and, having been approved by the chairman of the committee, Mr. E. Dwyer Gray, M.P., I have little doubt but that his powerful influence, exerted as it is in the cause of sanitary reform, will induce the Corporation to expend a large sum in the erection of dwellings under the Labouring Classes' Dwellings Act. Roughly speaking, from 100,000*l.* to 200,000*l.* might be advantageously and remuneratively expended in this work. One of the most urgently required measures for the improvement of the sanitary condition of Dublin is the erection of a large number of dwellings for the lowest classes of the industrial population. The buildings which have been erected by the Dublin Artisans' Dwellings Company and the Industrial Tenements Company afford excellent accommodation for a large number of persons. The former have now 270 tenements, containing 1,243 inhabitants. But there are probably at least 10,000 married men—labourers, porters, and messengers,—whose weekly earnings do not exceed 15*s.*; there are some thousands of poor widows, with or without families, old worn-out men and single women, earning a precarious living, and residing in wretched dwellings. To all these classes of persons the tenements of the Artisans' Dwellings Company are as inaccessible as are the houses in Fitzwilliam-square to ordinary mechanics. It is more especially the dwellings of these classes that urgently require amelioration. The weekly rents paid by several thousands of the very poorest classes vary from 8*d.* to 2*s.* In the tenements which I have just described circulates no inconsiderable proportion of the poisons of the zymotic diseases, and more especially those of small-pox (when epidemic) and typhus fever. There are three acts relative to the erection of dwellings for the labouring classes, namely,—The Labouring Classes' Lodging Houses and Dwellings Act (Ireland), 1866, 29 & 30 Vict., cap. 44; the Labouring Classes' Dwelling-houses Act, 1867, 30 Vict., cap. 28; the Artisans' and Labourers' Dwellings Act, 1868, 31 & 32 Vict., cap. 130. I shall now enter into a brief description of the kind of dwellings which, in my opinion, should be erected. Each should consist of a two-storied house containing four rooms; the dimensions of two of these should be 12 ft. in length, 12 ft. in breadth, and 12 ft. in height, a capacity of 1,728 cubic feet, and two rooms 10 ft. by 10 ft. by 10 ft., 1,200 cubic feet. The house need only be of the plainest kind, but the stairs, doors, and window-frames should be strong, so as to resist rough usage; the cost of such a house would not be more than 125*l.*, and of the site, say 35*l.* If each house cost 150*l.*, then 666 could be erected for the sum of 100,000*l.* The average number of individuals per family is about 4·5, therefore the 666 tenements would provide for (at the rate of two families per house) 6,000 persons. For each tenement of two rooms the rent should be 2*s.* per week. This is somewhat more than many labourers pay; but I am sure there would be no difficulty in getting tenants for two good rooms at so low a rent. The existence of such 1,332 tenements would stimulate the owners or renters of the ordinary low-class tenemental dwellings to a healthy competition, which would be the means of causing a general improvement in the condition of the homes of the people. Would the erection of 666 tenement houses such as I have described entail a permanent burthen on the city? I do not think it would. Let at 10*l.* 8*s.* per annum per house, the revenue would be 6,364*l.*; 4,000*l.* a year interest (which would gradually extinguish the debt) on the loan required to build the houses would be paid out of the rent. Supposing that even a considerable number of tenants were defaulters, 1,000*l.* per annum would be more than sufficient to keep the houses in repair. It is regrettable that the humbler classes do not form themselves into building clubs for the purpose of purchasing or building dwellings for their own use. There are only two or three such associations in Dublin, but their capital is very small. The excellent building society which was established thirty years ago at Carlisle is one which I would gladly see copied in this city. The members of this society can borrow 100*l.* for the purchase of a dwelling, and repay the money in weekly instalments of 3*s.* 4*d.* during a period of 16¾ years. The income of the society in 1879 was 145,767*l.*, and the expenses of management only amounted to 468*l.* 11*s.* 4*d.*, the fees paid to the committee being the modest sum of 15*l.* The capital of the society amounts to 427,198*l.*, and its members receive good dividends.

Mr. Edward Spencer, secretary of the Dublin Artisans' Dwellings Company, also read a paper on the subject, in which he gave an account of the operations of that company, who are spending 66,980*l.* in providing accommodation for 531 families, and then considered the best means of surmounting the difficulties by which the task of providing accommodation for the working classes of Dublin is at present surrounded.

After some discussion, on the motion of Mr. H. H. Collins, secretary of the Health Section, the following resolution was passed, with one dissentient:—

"That it is the opinion of this section that it is desirable that the Corporation of Dublin should seriously consider the propriety of providing dwellings for the labouring classes under the provisions of the various Acts of Parliament relating thereto, and that the Council be requested to submit to the Corporation this expression of its opinion."

BURGLARS AND BUILDERS.

Dark nights and visions of making a fortune at one stroke are sufficient attractions for Bill Sykes and his fraternity to cause them to leave their domestic firesides and seek the residences of those whose households offer facilities for satisfying their desires. The tramp seeks more frequently than not but food and shelter for a night. The professional housebreaker seeks other spoils of a more valuable nature. The former individual is often a harmless, miserable, half-starved creature, driven by the pangs of hunger to desperation; enfeebled, perhaps, by disease, or emaciated through want of bodily necessities. When disturbed in his nocturnal rambles he is ofttimes supplicating in manner, seeking alms, or asylum from the weather, working on one's compassion rather than anything else. But the latter personage, the *crême de la crême* of the profession, does not rely on such feminine modes of satisfying his desires. He is powerful in brute strength, and aided by the implements of his craft,—the "jemmy," crowbar, revolver, or knife,—is sufficiently strong in himself as to experience no pangs of fear at being disturbed in the midst of his labours. Who knows but what the burglar feels sensations of pleasurable delight when encountering an unarmed and defenceless being at dead of night and alone? The sense of superiority that reigns within his soul, and the sensibility of the utter powerlessness of his antagonist, may, no doubt, create a gratifying sensation in the intruder's mind, armed thus *cap-à-pie*. Recent events rather seem to point to this, at all events. Shooting blindly at policemen with revolvers is undoubtedly the outcome of such ideas. Considering how open many houses are at the present time for such attacks, and what opportunities they present for attaining easy access to their interiors, it is rather a surprise that more care is not bestowed on such portions as offer peculiar facilities for accomplishing this. It is a question whether the subject of household defence rests more especially with the architect or builder. The former is distinctly responsible for the arrangement of such openings as windows, doors, &c.; and the last-named, the execution and final adjustment of locks, bolts, bars, window-catches, and similar means of defence. It is a fact, however, that too often the security of a dwelling is but a secondary consideration, the exterior beauty and form of the edifice being of pecuniary importance in the eyes of the builder as more likely to gain the object he has in view,—the speedy sale or letting of the mansion. "An Englishman's house is his castle," and as such should be treated in a manner befitting a structure of this nature, respecting the dangers to which it will be subject, and the uses to which it will eventually be put.

Iron bars intended to guard basement windows are, as a rule, easy of removal by mere strength of arm; window-panes may be cut through without an expenditure of much labour; catches are wrenched off with equal facility; locks are picked without difficulty, doors are prised open, and panels drilled through without employing much force or taking up any considerable time. It must, however, be owned, that burglaries frequently occur through the carelessness of domestics or those intrusted with the supervision of defensive fastenings. But still there is a wide margin on the other side, and one that admits of considerable improvement by the building trade.

Some time back there appeared in the pages of a comic weekly a series of cartoons descriptive of the shortcomings peculiar to the modern "builder." Amongst the illustrations were two which touched directly on the subject under consideration. The first of these represented a gentleman at an ironmongery emporium purchasing sundry bolts of massive construction. The second picture depicted one of the "Trade" doing the same, but in this instance the article purchased is of a more slender make, and is described there as giving "*fifty* to the ounce." "It is the custom of the trade," might be advanced as a suitable solution of the question, and an explanation of the difference that exists between the articles designed for the builder's use and those intended for that of the private individual. In many modern houses there is a tendency to place windows too near the ground, and to omit to protect some by suitable metal bars strongly fixed in the brickwork. Even this protection is in reality not wholly sufficient. Such windows should be provided with internal shutters of stout construction, for even if a bar were filed or bent away sufficiently to allow the burglar to cut a hole in the glass, move the catch, and open the window, it would be a difficult job, if not quite impossible, to break or remove a strong shutter fastened internally. Front windows, when on a level with balconies or broad cornices, should be secured by thick shutters inside, and this care should more especially be observed in the case of those abutting but a foot or so from the ground.

It is a curious fact that although so much attention is usually bestowed on hall-doors, the windows adjoining the same have escaped attention. We find, as a rule, such doors provided with a couple of heavy bolts, a strong lock, and a massive chain. Now it stands to reason that a burglar desiring to enter a house quietly and unobserved would certainly not choose a large and massive door facing the roadway to effect his purpose. In fact, one might say, without much fear of falling into error, that not one burglary in a hundred has ever been accomplished by this means. To abstract a pane of glass and open a window

is the work of a moment with a skilful thief, and a much easier task than drilling the panels of a strong and thick wooden door for the purpose of destroying the bolts or locks.

There is another source of danger, too, that lies in the *roofs* of many houses. The traps communicating with the leads are usually destitute of any fastenings whatever, and the same may be said of the trap-door which opens from the loft to the landing. These last always open inwards, so the task of removing them is not a very arduous one. Has the possibility never suggested itself to the householder that it would be a matter of no great difficulty to enter an empty house, climb to the roof, walk along the roofs of adjoining buildings, and then drop through, by means of a rope, to any desired habitation? This simple fact seems to have been quite forgotten; for we doubt if there exists one house that is adequately provided with suitable means for preventing this mode of entering its interior. A fruitful source of danger lies in these traps, and their security should be a matter of consideration amongst all whose dwellings are provided with such.

Then there is the question of coal and cellar flaps, conveniently placed for thievishly-inclined persons to get down into the basements of houses, and rarely, if ever, properly secured against removal.

The above points, necessarily briefly enumerated, all more or less concern the builder, and it should be a matter of importance with him to see them properly attended to.

It would be folly to say the building trade wanted "waking-up," but still a "hint in time" may, perhaps, like the proverbial "good stitch," prove of some use as a means of pointing out some flaws in the trade of an obvious nature, and, therefore, causing remedial measures to be taken in the future. A. J. D.

PARIS.

The Rue de l'Abbé de l'Épée, near the Luxembourg, has been extended to the eastward for a length of about 330 ft., as far as the Rue Gay-Lussac. The western end of this street, between the Boulevard St. Michel and the Rue St. Jacques, is proposed to be widened, but this improvement cannot at present be carried out, as the widening would necessitate interference with the garden of the Deaf and Dumb Institution, which abuts upon the south side of the street. The Abbé de l'Épée (born in 1712, died in 1789), whose name is preserved by the street, was the founder of the Deaf and Dumb Institution in the Rue St. Jacques, and there is a statue to him in the court-yard, as well as a bust in the school-room.

On the site of the ancient prison of the Abbaye, which was finally destroyed by the construction of the Boulevard St. Germain, an open space or "square," as the French now prefer to call it, will be formed adjoining the ancient church of St. Germain-des-Prés, which will be called the Square de l'Abbaye. In the centre of this square it is proposed to place a statue of Bernard Palissy, the potter, whose name is also preserved in a small street in the neighbourhood.

The trees on the Boulevards of Paris are gradually disappearing, attacked by a disease which, up to the present time, has baffled investigation. It appears that the tree that best resists the effects of the atmosphere of Paris is the tree called by the French the *Vernis de Japon*, which was first introduced into France in the year 1871. Another tree which equally withstands the depressing influence of the metropolis is that called the *arbre du Judée*, distinguished by its red flowers and ample foliage. There are several examples of this tree in the squares of Paris. The *trianchonthos*, a thorny shrub, which frequently attains a height of 40 ft., appears also to flourish in the climate of Paris.

An exchange has been recently effected between the City of Paris and the French Government, by which the former has ceded to the latter a considerable space of ground situate on the west side of the city, called L'Île des Cygnes, in return for the site of the park of the permanent exhibition established in the Champ de Mars. This Île des Cygnes, like our own Isle of Dogs, although originally detached, now forms part of the City, and comprehends the Quai d'Orsay, the Government tobacco-manufactory, the esplanade of the Invalides, the suburb of Gros-Caillou, and a portion of the Champ de Mars. In the middle of the eighteenth century there existed *en aval du Pont de Concorde* a large island, containing about 250 acres (100 hectares). This island was then called the Île de Malequerelles, on account, as it is said, of the frequent disturbances which took place there between the students of the University and the inhabitants of the villages of Auteuil, Grenelle, and Chaillot. A celebrated resort of pleasure-seekers in the vicinity, known as the Moulin de Javelle, and numerous drinking-shops, attracted a large number of Parisians here during the summer months. On this island a large number of the bodies of the victims of the Massacre of St. Bartholomew were buried. According to a contemporary account, wagonfuls of corpses of both sexes and all ages were thrown into the river. These corpses were carried by the tide as far as the Île du Louvre and the Île de Malequerelles, where they were removed from the water, and interred to prevent danger from infection. The same document informs us that the number of bodies interred in the neighbourhood of St. Cloud and Auteuil was about twelve hundred.

In the reign of Louis XIV. the Île de Malequerelles acquired the more harmonious name of the Île des Cygnes. In later times the ground was gradually built upon, and recently a portion has been devoted to the service of the Garde Mobile and the Government Marble Dépôt.

A small island in the middle of the Seine, between the Pont de Grenelle and the Pont de Jena is still called the Île des Cygnes, and is a favourite resort of anglers.

A CIRCLE RAILWAY FOR VIENNA.

After a long period of stagnation, greater activity is beginning to prevail again in the matter of providing better intercommunication than at present exists between the various parts of the Austrian capital. The local railway project, which has been allowed to slumber since 1873, has once more become one of the burning questions of the day, various plans having been submitted to the public, the project of Mr. Fogerty, an English engineer, of a circle railway being especially much talked about. The data which follow have been taken from the *Bautechniker*. The railway as planned would for its greater part (5½ miles out of a total length of little over 9 miles) be a high-level one, and run on an iron viaduct. Its object is to connect a central station, to be erected, with the existing termini and the other parts of Vienna and its suburbs. The central railway station is to be located at the Donau-canal, in the Franz-Josephs-Quai Park. Thence the line would run on an iron viaduct along the canal to the Aspern Brücke, and the slope of the left, or, according to the latest modification, the right, Wien-Ufer as far as the Schlachthaus-Brücke, in the sixth district, in which course all the bridges of the Donaucanal and the Wienfluss intersected are to be crossed by raised viaducts. At the Schlachthaus-Brücke the tracing turns into the Gürtelstrasse, which it follows as far as the Währingerlinie, and across which the line would run, according to the configuration of the ground, partly on viaducts, partly in cuttings or tunnels. The tracing then turns to the right through the Linienwall, passes through the ninth district, along the Alsbachstrasse to the Brigittabrücke, whence, along the Donaucanal, the junction with the central station is once more effected. From this closed circle a branch leads to the Franz-Josephs-Bahn, where locomotive and other sheds are to be erected. The maximum rise of the line will be 16·7 in 100, the minimum radius 533 ft. The permanent way is to have the normal gauge, and two lines of rails. Nineteen stations are projected, and a junction with the Westbahn and a branch to Schönbrunn and Hietzing are planned. The railway is to be completed in three years. The speed of the trains is to be only 18·6 miles per hour.

London Sanitary Protection Association. The first general meeting of this Association will be held at the Society of Arts, John-street, Adelphi, on Tuesday, the 25th inst., at eight p.m., Professor Huxley, F.R.S., President of the Association, in the chair. Professor Fleeming Jenkin, F.R.S., will give an account of the progress and success of the Association from its establishment up to the present time.

LONDON REVISITED.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

At the recent meeting of the British Archæological Association at Malvern, it was proposed to repeat the experiment made last autumn,—and with much success, notwithstanding unfavourable weather,—by arranging for a few days in London for the special behoof of the country members of the Association. After a good deal of consideration, it was decided that the excursion should commence on the 14th and end on the 18th of this month, and with Mr. G. R. Wright, F.S.A., and Mr. George Patrick as hon. secretaries, and Mr. John Reynolds as treasurer, a very successful programme was arranged and entered on, the weather having been, on the whole, very favourable. We append some brief notes of the four days' visits.

St. Paul's Cathedral

was selected for the first visit, and accordingly, at about eleven o'clock on the morning of Friday, the 14th inst., a party of about sixty ladies and gentlemen assembled at the western entrance of the cathedral, where they were met by the Rev. W. Sparrow Simpson, D.D., F.S.A., one of the minor canons, and by him conducted over the building, beginning with the crypt, where some fragments of Old St. Paul's were pointed out. The tombs of Wren and other men distinguished in art were pointed out in the well-known "Artists' Corner," while the other "lions" of the crypt, foremost amongst which are the Nelson and Wellington sarcophagi and the Wellington funeral car, were regarded with much interest by the visitors. Ascending to the floor of the cathedral, the visitors were conducted into the choir and aisles, where the carving by Grinling Gibbons and the ironwork by Huntington Shaw, as well as the principal monuments, were pointed out. Upstairs in the Library of the cathedral, some rare books were brought out for the delectation of the visitors. All the pre-Reformation books belonging to the Library were burnt in the Great Fire in 1666. An inquiry by Mr. Lambert as to the cathedral plate elicited the reply that it was stolen in 1810. In the Trophy Room Mr. Edmund Ferrey's drawings of Old St. Paul's attracted a great deal of attention. Most of the party ascended to the Whispering Gallery, and tested for themselves the peculiar acoustical property of that part of the building. They did not go any higher, however, owing to the violence of the gale that was blowing at the time. Thanks having been accorded to Dr. Sparrow Simpson (who, it should be stated, recounted the interesting discoveries made during the last few years by Mr. Penrose, the surveyor to the fabric, on the sites of the old Chapter-house and Paul's Cross), the party proceeded to Anderton's Hotel, Fleet-street, for luncheon; and afterwards to the

Church of St. Bartholomew the Great, Smithfield.

Here Mr. Loftus Brock described the principal monuments in the church, including that of Rahere, the founder. This very well-preserved tomb is of much later date than the time of Rahere himself, having been restored by Prior Bolton, whose oriel window, having carved on it the punning rebus, a bolt or arrow driven through a tun or cask, is seen above one of the arches on the opposite side of the choir of the church. The monument in the south aisle to Sir Walter Mildmay, the founder of Emmanuel College, affords, as Mr. Brock observed, a good instance of the complete way in which the Classic styles had superseded Gothic at the close of Queen Elizabeth's reign. The date of this monument is 1589, and it is a pure example of columnar architecture. The monument contains some very beautiful detail, and is mainly of alabaster, inlaid with various coloured marbles.

Professor T. Hayter Lewis, in the course of a brief paper on the church, observed that so much had been said of late years as to the damage caused by the over-restoration of ancient buildings, that he would first point out that the parts of the ancient stonework which had been replaced were the two columns in the choir [those nearest the pulpit and reading-desk respectively], which were crushed and dangerous; the two centre columns of the semicircular apse [which had been destroyed altogether], a few parts of some other columns and piers which had been cut away for tombs, piers, &c.; and the tracery of the clearstory and north aisle

windows, which were noted in 1791 as being then destroyed. With these exceptions, the whole of the work is old. The history of the church was briefly this:—It was founded *temp.* Henry I. (1100-1135), by Prior Rahere, the founder, also, of the hospital, which was originally an infirmary for lying-in women and for children under seven years of age. Rahere was a prior of the order of Augustine or Austin (Black) canons. These canons had enormous influence, Mr. Parker noting that they possessed 127 houses in England,—amongst them being St. Mary Overie, Southwark, Stewkley, and Iffley. Rahere began the priory church of St. Bartholomew, it is stated, in 1103. The choir is said to have been consecrated in 1123, and the "rest of the work" ten years later, *i.e.*, in 1133. It was thus about co-eval with the naves of Durham (1099-1128), and of Norwich (1121-1145), and with the choir and eastern aisles of the transepts of Peterborough (1118-1155). The choir of Norwich (1096) was somewhat earlier, but only by a few years. The east ends of the choir of Norwich and of the choir at Peterborough were apsidal. St. Bartholomew's was apparently from the first a completely Norman building, having an eastern apse with a processional aisle round it. It also had at least three towers, as was shown by a seal attached to a charter dated 1133 ("Archæologia," xiv., p. 49; Dugdale, ii., p. 380). This seal was supposed to represent the south side of the church and of the Lady Chapel. The church seems to have been completed in 1133, when Archbishop Boniface, of Savoy, made his celebrated visitation. He (Prof. Lewis) had not been able to find out anything about the nave, if one existed at that time, but he had thought that by looking up some of the old writers who mentioned the scene that took place on the occasion of the archbishop's visitation, he might be able to throw some light on the subject. It would be remembered that great scandal was caused in the church from the fact that in the course of a scuffle in which the archbishop took part, he was found to be wearing a suit of armour beneath his ecclesiastical robes. He had turned to Matthew Paris, and he had met with a rather curious passage, which he did not think had been noticed elsewhere. Matthew Paris said (according to Mr. Giles's translation) that the monks received the archbishop in the middle of the church, that is, the choir ("*In medio ecclesiæ, videlicet, in choro*"). The nave, anyhow, was rebuilt somewhere in the thirteenth century, in, of course, the Early English style. Considerable alterations were made in the church by Prior Bolton (1526-32). In 1544, Henry VIII. sold the priory house, with dormitory, chapter-house, cloisters, refectory, &c., ordering that the church should be a parish church, as it is now. The ground, 87 ft. long, rendered vacant by the destruction of the nave (which was then pulled down) was reserved for a burial-ground. The piers to the south aisle of the nave were standing until 1856, when they were pulled down to widen the path. The bases were left underground, but are now to be seen, as the ground has been lowered. The ugly brick tower at the present west end of the church is said to have been built in 1622-28 in place of the steeple which was then pulled down to its foundation. The whole church was doomed to destruction at the beginning of the present century, on the plea that it was dangerous, and it was only saved by the energetic efforts of an architect, Mr. Hardwick, an ancestor of the present architect of that name. At the east end of the choir, behind the apse, are considerable remains of a large building, which was evidently entered from the church by an opening about 20 ft. wide, the piers of which remain, and are of Perpendicular masonry, and have Perpendicular capitals. Probably two detached columns came between these, and it was very likely that the whole was erected at about the same time as the eastern straight wall cutting off the apse. An oratory was mentioned here as dedicated to the Blessed Virgin (Cottonian MSS.), but it was not likely to have been built in Norman times, as the external buttresses, as well as the piers just described, are of late date, and a Lady Chapel beyond the apse was not common in Norman work. There is one at Norwich, but it was added in the thirteenth century. Beyond the church were the buildings of a complete monastery, inasmuch as the Austin Canons, though not monks, nor, of necessity, priests, lived much as monks did, and with the same kind of monastic buildings. Of these, an excellent notice exists in the *Gentleman's Magazine*, vol. 79 (pp. 226-7), describing their state in 1791. The east cloister only then remained. It was used as a stable. It is now all gone, having fallen down in 1833. There is a perspective drawing of it in Stow's "London." On the east side of the cloister was the chapter-house, of oblong form and of Henry III.'s time (1216-72). The walls in 1791 remained 3 ft. or 4 ft. high, the space enclosed by them being used as a wood-store. The walls are now destroyed and the space built over. Directly against the south aisle was a small chapel, described as "magnificent," having a grand entrance from the south transept and another from the church. Of this, except the latter doorway, no trace remains. The north transept was quite destroyed, and the site was then, as it still is, occupied by a smith's shop. The south transept remained, but it was unroofed, walled-out from the church, and used for burials. This, too, is now destroyed. A good drawing of it is given in Wilkinson's "Londinia Illustrata," 1819. The nave is stated to have been pulled down in Henry VIII.'s time. The series of vaults abutting south of the chapter-house were of great extent, upwards of 130 ft. long and 30 ft. wide, groined from the walls on each side on to a central row of pillars (round and octagonal alternately), and formed, no doubt, the ground-story of the dormitory which existed here, as at Westminster, Battle, &c., with a passage over the chapter-house as a ready access for the monks to the church. The whole of this has been removed quite recently. In 1868 the restoration of the present church (*i.e.*, the choir of the old church) was taken in hand by the late Mr. Slater and Mr. Lewis, under the direction of a committee, whose chief members were the present Rector, the Rev. J. Abbiss, the late Mr. J. Boord, Mr. Foster White, and the late Sir William Tite. The condition of the church was then briefly this:—It was filled to a depth of between 2 ft. and 3 ft. with earth, which had been filled in, owing, no doubt, to defective drainage at the old level. The two columns already alluded to were crushed and in a dangerous state, owing to a defective foundation. The apse was cut off by a straight wall, the upper part of which still remains, supported on an iron girder; and the space behind it over the eastern aisle, and the large building behind it, supposed to have been the Lady Chapel, were occupied as a fringe manufactory. This wall was built in Perpendicular times, as is shown by the portions of window-jambs which still remain. The wall of the north aisle had been forced out, and the arches were very unsafe. The north triforium was used (as it still is) as a school, and the south triforium was destroyed. There was a huge gallery at the west end, and the space on the ground level, under the south transept aisle, was enclosed as an access to the Vestry, which was, and still is, over the transept-aisle. What was done in the restoration was this: The earth was cleared out, the exact level of the old paving ascertained, and the whole site drained. An exact plan was taken of all the gravestones, which were carefully marked and replaced precisely under their original positions. The two columns referred to, and those required to complete the apse, were rebuilt with large stones, so as to show the precise amount of new work. The wall of the north aisle was raised by levers to an upright position, as had been done before at Hereford, and since (on a much grander scale) at St. Alban's. A new foundation was prepared, and the wall and arches raised without injury to a single stone. The most important part of the work, however, viz., that to the apse, remained to be done. Possession could not be obtained of the factory at the back of the wall, and, after earnest consultation with the Architectural Committee of the Incorporated Church Building Society, the architects for the restoration advised that the original plan of the lower part of the apse should be restored, though the upper part could not be, and the lower part of the wall was therefore cut away and supported as now seen. In removing it, it was found to be largely built of fragments of Norman and Early-English work, the greater part of which has been preserved at the east end of the south aisle. There also, against the wall, is preserved all that could be found of the old paving tiles. The stonework throughout was thickly coated with numerous coats of white-wash and colour, but as the architects feared to have the stone injured, it was merely scraped with wooden scrapers, and where these were insufficient, or where the stone was merely dirty, the old surface was left untouched otherwise than by washing. The effect was, no doubt, to leave the church in a not very clean state; but, on the other hand, the old work was uninjured, and in many places the fine diagonal tooling of the Norman masonry can be seen as it was left some 750 years ago. At the west end, beyond the central tower, are clear indications, both in the aisle and above, of the Early English work of the nave. The transept arches of the crux are pointed, whereas those of the east and west are round. Now these pointed arches could scarcely have been of earlier date than 1175 or 1180, and it is an open question as to whether they were delayed in building until that date, or whether they were afterwards re-set, as in the well-known case of the aisle-arches at York next the central tower. Professor Lewis said he had examined them carefully from a ladder, but could see no evidence of this, and his opinion as to their being really of later date than the east and west arches was strengthened by the fact that the arch-mouldings were also somewhat different. But some very curious alterations had taken place in this part of the church. The Norman corbels to the west arch had been re-carved as Perpendicular. Some of the Norman stonework at the base of the north-east pier has been replaced by Perpendicular, and the capitals of the columns of this and the opposite (western) pier have been altered to Perpendicular. The clearstory windows to the Norman clearstory wall were filled in with Perpendicular tracery, and the east end of the choir had been continued square, above part of the circular apsidal wall, up to the east wall which, in Perpendicular times, had cut off the apse. All this work has been left untouched, except as before described, so that an architect going over the old church now could read its history, so far as the dates and the changes are concerned, almost as well as though the writing were in a book instead of being placed indelibly on the stones. Professor Lewis concluded by detailing the differences in the tooling and other characteristics of masonry of various periods, and told an amusing story of a learned archæologist who had conceived a theory that the church had been built to a large extent under the influence of Byzantine architects, because he had discovered that the groining of the south aisle was domical. Unfortunately for his theory the groining was of lath and plaster, put up in the year of our Lord 1830 by Johnny Bligh, district surveyor.

Mr. Loftus Brock, in some supplementary observations, said it was impossible to look at the church without coming to the conclusion that a nave had existed at some early period of the history of the fabric. He cordially endorsed all that had been said by Professor Hayter Lewis as to the arches which supported the central tower. On behalf of the visitors, he expressed thanks to the rector, Mr. Abbiss, who was present, for kindly permitting the examination of the church, and to Professor Hayter Lewis for his interesting discourse. After a few remarks to the same effect from Mr. Wright, the visitors proceeded to

St. Bartholomew's Hospital,

where Professor Hayter Lewis, who is one of the Governors, introduced them to the Clerk of the Hospital, Mr. Cross. In the large Hall of the Hospital, approached by the grand staircase (painted gratuitously in 1736 by Hogarth,—the subjects being "The Good Samaritan" and "The Pool of Bethesda"), the visitors were shown by Mr. Cross an interesting series of documents and seals,—all, with the exception of the charter granted by Henry VIII., of pre-Reformation date. One of these documents bears the seal of Rahere. Several of the seals are perfectly preserved. It was stated by Mr. Cross that many of these documents had never been carefully examined in modern times, though possibly the perusal of some of them would amply compensate for the time and trouble needed for the work. Thanks having been given to Mr. Cross for his courtesy, a large number of the party proceeded through the City to see the

Roman Remains beneath the Coal Exchange.

These consist of portions of a hypocaust evidently belonging to baths, although, said Mr. Thomas Morgan, there seemed to be some difficulty in ascertaining whether the hypocaust formed part of public baths or of baths belonging to a private dwelling. It was most probable,

considering their smallness, that they belonged to a private dwelling or villa. When the remains were first discovered, in 1848, they were described in the *Journal* of the Association. They are enclosed on one side by a semicircular apse, and are protected by a large cage of ironwork. It was mainly through the efforts of the Association, in conjunction with the late Mr. Banning, architect, that these remains were preserved *in situ*. Eleven years later, *i.e.*, in 1859, further excavations made to the eastward of these remains brought to light a corresponding apse opposite to the one already mentioned. Mr. Morgan gave an account of Roman baths and bathing, and was thanked by the visitors for his discourse. In answer to a question whether, seeing that the level of the floor of the villa must have been at least 10 ft. or 12 ft. below the present level of Thames-street, the water of the Thames in Roman times was kept back by any sort of dyke or embankment on the Middlesex side, or whether the Thames did not then rise to anything like its present height, Mr. Brock said he thought there was good evidence for supposing that in Roman times the northern bank of the river was embanked eastward from London Bridge for some considerable distance, for a few years ago a Roman jar was discovered in the bank or dyke near North Woolwich, — an ancient defence which prevents thousands of acres of land from being flooded by the river.

The proceedings of the first day were wound up with a dinner at the "Criterion." On Saturday, the first place visited was

Barber-Surgeons' Hall Monkwell-street.

Here the visitors were received by the Worshipful Master, Mr. Woolley, and by Mr. Past-Master C. J. Shoppee. The last-named gentleman described the very interesting and large collection of plate belonging to the Company, and also said a few words about the Court-room and the pictures which it contains. The hall was built by Inigo Jones, and partially destroyed in the Great Fire. The present Court-room, however, is supposed still to retain the ceiling given to it by Inigo. In 1863 Mr. Shoppee acted as architect to the Company in designing and superintending the erection of the warehouses and offices which now occupy a large portion of the site of the ancient buildings of the Company. At that date the quaint old wooden doorway (dated 1671) which, until then, formed part of the Monkwell-street frontage, and which was illustrated in an early volume of the *Builder*, was removed to the interior of the small courtyard which now gives access to the Court-room, and utilised as an entrance. Of the pictures at present in the hall, the centre of attraction was, of course, the celebrated one by Holbein, representing the presentation of a charter to the Company by Henry VIII.; but there are several other interesting canvases here, including a portrait of Inigo Jones by Vandyck. Mr. Lambert read a very entertaining paper on the history of the Company, tracing the origin of the connexion between barbers and surgeons, and detailing the causes that led to the separation of the two callings in comparatively recent times. Thanks having been given to Mr. Woolley, Mr. Shoppee, and Mr. Lambert, the party made its way to the neighbouring

Church of St Giles, Cripplegate.

Here Mr. Brock described the architecture which is late in date. It is a very good example of a town church, and, in common with that of St. Andrew Undershaft and two or three other specimens of City churches, is in all probability a counterpart of many of those which were destroyed by the Fire. A peculiarity noticeable on the north side of the arcade, which is continuous throughout the whole length of the church, is that a narrow strip of space is left between the detached shafts of the pier. This peculiarity did not occur on the south side of the arcade, although it is in a line, carried transversely, with the recess for the staircase to the roodloft, the position of which staircase is still clearly to be seen on the exterior of the south wall. The more ancient church which formerly existed here had been rebuilt in Perpendicular times very much as it now existed. The roof is entirely new, but no doubt the original roof of the present building was like it. The restoration was carried out a year or two ago by Mr. Woodthorpe. The church is, however, interesting on other than architectural grounds. John Speed, the antiquary, was interred here, and there is a small monument to his memory on the south side of the church. Foxe, the martyrologist, was buried here, and there is a plain tablet to his memory at the west end of the church. John Milton was also buried in the church. The registers, which seem to be well taken care of, contain some interesting entries, including that of the marriage of Oliver Cromwell and Elizabeth Bourchier. Mr. Lambert remarked upon the fact that here, at the cripples' gate of a walled city, there existed a church dedicated to St. Giles, while in the walled cities of Germany, such, for instance, as Ratisbon and Nuremberg, it was invariably the case that there was a church dedicated to St. Gideon (another way of spelling Giles) near the cripples' gate. Proceeding outside the church, the visitors inspected

The Bastion of Old London Wall,

in the churchyard adjoining this church. This bastion is now within reach of sight by anybody, owing to the improvement recently made in carrying a public footpath through the churchyard from Jewin-street to Monkwell-street. South of this bastion is another which is concealed from view by buildings in Castle-street, Falcon-square.

The Church of St. Mary-le-Bow,

in Cheapside, was next visited. The church is now undergoing internal renovation. Wren's work was much admired by many of the visitors, but the chief point of interest for the party was the Norman crypt. Mr. Gwilt, who repaired the church early in the present century, described the crypt to the Society of Antiquaries in 1829. As he then pointed out, it affords the earliest Norman work known to exist in the City. The stones are all small in size, the joints are wide, and the details of the caps indicate the early character of the work. In one of the arches, now blocked up, Roman tiles are used as voussoirs. The two pillars now seen by visitors on entering the crypt are two out of six which divided the area into three divisions,—a centre and two aisles, so to say. Wren, in the "Parentalia," says that when the steeple of the present church was in progress he found the remains of a Roman temple, but Gwilt was of opinion that Sir Christopher must have mistaken this crypt, containing as it does Roman *material*, for Roman *work*. The church was formerly known as St. Mary de Arcubus, and St. Mary of the Arches, and, as Mr. Patrick reminded the visitors, the ecclesiastical tribunal known as the Court of Arches derived its name from having held its sittings in this church. At the

Chapel of St. Etheldreda, Ely-place, Holborn,

which was next visited, the party was received by the Rev. Father Lockhart, who described the history of the building, which was probably the last place in London in which the old rites were used, for in the time of Elizabeth and James I. it was let to the Spanish Ambassador, who used it as a chapel. In the time of Charles I. it was used for the Anglican worship. About a century ago the property was bought by a builder, who pulled down the other remaining parts of the palace of the bishops of Ely, and built the street now known as Ely-place upon the site, but he retained the chapel, and let it as a proprietary chapel to a minister of the Church of England. It was subsequently used by a congregation of Welsh Episcopalians, and, a few years ago, the property having got into Chancery, was sold by order of the Lord Chancellor. In all its essential features, particularly as to the two magnificent end windows, it remains intact. The roof, with the exception of the tie-beams, is the original one. There are one or two interesting features in the crypt or undercroft, which, at one time used for the storage of beer by Messrs. Reid, the brewers, was, at another period, and concurrently with the use of the chapel for religious purposes, occupied as a tavern,—drunken brawls below frequently disturbing the congregation above. The visitors having thanked Father Lockhart, next partook of luncheon at the Holborn Restaurant, and subsequently went to

Sir John Soane's Museum, Lincoln's Inn Fields,

where they were received by Mr. James Wild, the curator, and some of the trustees. They spent some considerable time in inspecting the large and varied and but too-little visited collection of objects of art and antiquity. The space in certain portions of the museum is so limited, and the visitors were so numerous, that they could not be conducted *en masse* over the premises. They therefore divided themselves into small parties, visiting the different apartments, under the guidance of Mr. Wild, Mr. Lambert, Mr. Thomas Blashill, and other gentlemen. Thorpe's book, and the collection of drawings by Adam, were examined with interest.

Staple Inn, Holborn,

was the last building on the programme for Saturday, and thither a considerable number of the visitors wended their way. The inn, which is known to most Londoners by the picturesque old overhanging houses which form the Holborn front, is, as was explained by Mr. Burrell, one of the Inns of Chancery (not Inns of Court), and the hall is probably the best of those which remain in connexion with the Inns of Chancery. Originally each of the Inns of Chancery was attached to one of the Inns of Court, and the Inn of Court to which Staple Inn was attached is Gray's Inn. The Inns of Chancery were, indeed, originally overflow hostelries for receiving the students who could not be accommodated by the Inns of Court. Mr. Brock, in describing the hall, commented on its similarity to those of the Middle Temple and Lambeth Palace,—the former being the earliest and the latter the latest of the three. It was very gratifying, he said, to see it maintained in such good preservation, and it was to be hoped that the Principal, Antients, and Members of the Society of Staple Inn would continue to take care of the interesting buildings which vested in them. Before the visitors left the hall, they thanked Mr. Burrell for the interesting particulars given by him concerning the inn.

York House Water Gate.

On Monday morning the visitors mustered on the Victoria Embankment, opposite Cleopatra's Needle, and after a few remarks about the obelisk by Mr. Lambert, they crossed the road and entered the gardens, in order to proceed to the front of the water-gate attributed to Inigo Jones, and which is now, as we have often pointed out, half-buried in a hole at the foot of Buckingham-street. It was formerly the river-entrance to York House, of which it is the only remnant. Mr. Wright recounted the efforts which were made a few years ago by the British Archæological Association to induce the Metropolitan Board of Works to allow the gateway to be raised *in situ*, and utilised as an entrance from Buckingham-street to the Embankment-gardens, but the result of those efforts was unsatisfactory, the Villiers family or their representatives interposing some objection. Taking train by the District line from Charing-cross to Sloane-square, the visitors soon arrived at

The Royal Hospital, Chelsea,

which, as recorded in the Latin inscription over the colonnade, was founded by Charles II., and completed in the succeeding reigns of James II. and William and Mary, for the purpose of affording a home to soldiers disabled by wounds or age. The visitors were received and conducted over the buildings by the Governor (Sir Patrick Grant), the Major and Lieut.-Governor (Colonel Wadeson), and the Chaplain (the Rev. S. Clark). The foundation-stone of the hospital was laid in 1682, and the main building was completed and opened in 1692. The architect, Sir Christopher Wren, became a Commissioner of the Hospital in 1691. Besides the hall and chapel, the main building contains berths or bunks for 538 men, all separately enclosed, besides library, kitchen, and other apartments. The most important addition made to the buildings since Wren's time is the Infirmary building, a detached structure on the west side, adapted in the year 1809 from a house in which Sir Robert Walpole had resided. Sir Robert Walpole's drawing-room, now used as one of the wards, was inspected by some of the visitors. It has a very good enriched ceiling. The excellent woodwork in oak in the chapel and the great hall (formerly used as a dining-hall, but now as a general day-room) was much admired by the visitors, who also evinced much interest in the numerous tattered flags, trophies of war, suspended from the walls of those apartments. In the state-room of the Governor's House, some valuable pictures were shown, including a large canvas by Vandyck representing Charles I. and Queen Henrietta Maria and children. This room also contains a very fine carved mantelpiece, by Grinling Gibbons. Having thanked Sir Patrick Grant and the other officials of the

Hospital for their courtesy, the party proceeded along the Chelsea Embankment to

Chelsea Old Church,

where Mr. Loftus Brock pointed out some fragments of early work in the Lawrence chapel, on the north side, but none of the work to be seen was earlier than the middle of the fourteenth century. Two singular capitals, on the south side of the chancel, were known to be of Sir Thomas More's time, for they were dated 1528. Sir Thomas More's connexion with the church was briefly dwelt upon, and it was observed that the monuments were the chief feature of interest in this curious old building. Pointing to the monument containing a figure by Bernini, of a lady of the Cheyne family, Mr. Brock observed that it was a beautiful piece of workmanship, and was worthy of being kept in a better state of repair than it apparently is. Passing round at the west end of the church, the visitors saw the chained books,—a survival from Mediæval times. Perhaps the finest monument in the church is that of Lord and Lady Dacre, in which the recumbent effigies are of alabaster, the remainder of the monument being of very rare marbles. It dates from the latter part of the sixteenth century. The monument of Lady Jane Guildford, who died in 1555, is one of the most ancient in the church. That of Sir Robert Stanley, dated 1632, though very costly, is more curious than beautiful. After thanking the clergy for permitting them to see the church, the visitors partook of luncheon at the Pier Hotel, Cheyne-walk, and afterwards proceeded in carriages to

Holland House.

Through the principal rooms of this "stately home,"—which, besides being abundantly rich in historical and literary associations, is a storehouse of objects of art and antiquity,—the party was conducted by Mr. Lane, the house steward. After the visitors had spent more than an hour in feasting their eyes with the treasures they beheld, Mr. Wright gave a brief historical sketch of the history of the owners and occupants of the house, quoting from the Princess Lichtenstein's book and from Leigh Hunt's charming work "The Old Court Suburb." Mr. George Lambert then read a brief paper on Inigo Jones, detailing the leading incidents in his career, and pointing out how, on his work at Holland House, he had left the impress of his studies in Italy. Mr. Loftus Brock, in some supplementary observations, remarked that in the celebrated book of plans by John Thorpe, in the Soane Museum, seen by some of the visitors to the Soane Museum, there was a plan inscribed "A House at Kensington for Sir Walter Cope, by me, J. T." That plan showed the exact amount of the work done by Thorpe at Holland House. He thought, however, that without reference to that plan it would be possible to tell which was Inigo Jones's work by the stone used. Wherever Portland stone was used, there it might be safely concluded that the work was by Jones. Before leaving the house, Mr. Wright moved, and Mr. Patrick seconded, a vote of thanks to Lady Holland for permitting them to visit the mansion, and to Mr. Lane for conducting the visitors through the apartments. All who have been privileged to go over Holland House will reciprocate the sentiment of the lines (seen by many of the visitors on Monday), written in 1811 with a diamond by the Right Hon. Jno. Hookham Frere on the glass of a dressing-room window in the east turret,—

> "May neither fire destroy nor waste impair,
> Nor Time consume thee till the twentieth heir.
> May Taste respect thee and may Fashion spare!"

Tuesday was the fourth and last day of this London outing of country members. Assembling at the Charing-cross Station of the District Railway, at ten a.m., they proceeded by train to the Fulham Bridge Station, whence they walked to

Fulham Palace.

Here the Right Rev. Dr. Jackson, Bishop of London, received the visitors, and conducted them over the older parts of the palace buildings. The oldest part of the existing buildings is what is known as the Bonner quadrangle, although it was built by Bishop Fitzjames, in the reign of Henry VII. Over the fireplace of the hall is the following inscription:—

"This hall, with the adjoining quadrangle, was erected by Bishop Fitzjames, in the reign of Henry VII., on the site of buildings of the old palace as ancient as the Conquest. It was used as a hall by Bishop Bonner and Bishop Ridley during the struggles of the Reformation, and retained its origina proportions till it was altered by Bishop Sherlock, in the reign of George II. Bishop Howley, in the reign of George IV., changed it into a private unconsecrated chapel. It is now restored to its original purpose on the erection, by Bishop Tait, of a new chapel of more suitable proportions. A.D. 1866."

Some of the rooms upstairs in the old portion of the palace, now used as domestic offices, were seen by the visitors, and found to contain some good linen-pattern panelling in oak. A question was raised whether the existing bargeboards on the gables facing the river were the originals. The oak of which they are made is certainly very much weatherworn. The new chapel, mentioned in the foregoing inscription, and erected from the designs of Mr. Butterfield, was next visited, and subsequently the library and other rooms in the palace were inspected, chiefly for the sake of the interesting and unbroken series of portraits of bishops of London, beginning with Ridley. In the grounds of the Palace the Bishop pointed out the sad havoc made by the storm of the 14th inst. No fewer than thirty-seven fine trees, many of them of great interest (including the celebrated black walnut-tree), fell before the gale. Similar disasters were met with in Holland Park, in Bushey Park, in the grounds of Hampton Court Palace,—and, indeed, almost everywhere.

Having thanked the Bishop of London for his kindness, the party left the Palace, expecting, on the faith of the programme, to find carriages awaiting to take them on to Kingston. The fortunate few who had their own private carriages were enabled to drive on to Kingston, *viâ* Wimbledon, but the great majority of the excursionists were doomed to suffer a provoking delay, for no carriages were at hand. After a time, it was discovered that, by some inexplicable blunder on the part of somebody or other, the carriages had been sent, not to the Bishop of London's Palace at Fulham, but to the Archbishop of Canterbury's Palace at Lambeth! However, the party ultimately arrived at Kingston, and the majority of them were fortunate enough to get their luncheon at the "Griffin." Just two hours late they arrived at Hampton Court Palace. It was now nearly five o'clock, and getting dusk, and as the greater portion of the Palace was closed at four o'clock, it goes without saying that the belated visitors saw very little of the building and its contents. Mr. Chart, the courteous clerk of the works at the Palace, conducted the party into the great hall, but beyond this, little could be done, and so terminated, somewhat ingloriously, what has been, on the whole, a very successful and interesting series of visits.

INTERNATIONAL COLONIAL EXHIBITION IN AMSTERDAM.

The Dutch Government is already beginning to make preparations for the holding of an International Colonial Exhibition in Amsterdam from May to October, 1883. This project is quite unique in its kind. The Dutch Government has submitted to the various powers possessing colonies the programme of the proposed exhibition. This is accompanied by remarks on the advantages of diffusing information respecting regions of the globe which are only waiting for the application of capital and technical skill to yield almost incalculable wealth. It is intended in the coming international display to illustrate by a certain class of the exhibits the growth of colonies; in short, to show what they were and what they are. The exhibition will be divided into five sections. In one of these raw materials and colonial produce generally will be illustrated. The public works and means of communication, the military and naval resources, as well as the *fauna* and *flora* of the various colonial regions, will be all well represented. Another section of the exhibition will deal with the export trade of the colonies, and here the extent to which European manufactures depend on the raw products of the colonies will be fully illustrated. The third section will illustrate the progress of art amongst colonial races, and will show the influence of civilisation upon their condition. In the fourth section will be given an exhibition of articles produced in the Netherlands which are adapted for colonial use. The fifth and last section will be an entire novelty. This division of the exhibition is intended to illustrate by a series of lectures and addresses from gentlemen of experience and authority, the best methods of developing the enormous resources of the colonies. They will also deal with the subjects of science and art, education, sanitary matters, acclimatation, and international law in reference to colonial dependencies. The economical effects of the relations existing between colonies and the mother country will likewise be the topic of special discussion.

In order to achieve the success contemplated by the Dutch Government in starting this exhibition, the co-operation of all the powers possessing colonies will be necessary. It is hoped, therefore, that Great Britain, France, Spain, Portugal, Russia, Denmark, and Sweden, —these being, in addition to Holland, the only States possessing colonies,—will cordially accept the invitation of the Dutch Government, and cause their various dependencies to be appropriately represented.

THE OLDEST GERMAN TOWN-HALL.

The oldest town-hall or "Rathhaus" of Germany appears to have been discovered at Gelnhausen, in Hessen. Not far from the Romanesque church restored for Protestant worship by Dombaumeister Schmidt, of Vienna, —of whom we speak in another article in connexion with the erection of the most recent town-hall in that city,—an undoubtedly Romanesque building has lately been disclosed. It is still disfigured and quite hidden by a flat building of framework with lean-to roof, and looks, in its present state, like a large dilapidated barn, which is partly used for stacking hay and corn, partly left to ruin. We hear that it is intended to free the building from its encumbrances, and restore it as far as possible. There is still in existence a basement with vaults of fir, a large hall over it, as well as another hall in the first story, reached by a small winding staircase. The large hall on the ground-floor is approached by a portal, still preserved, in the centre of the principal front, the left corner pillar of which stands clear, while only so much of the right-hand pillar is uncovered as enables the Romanesque capital, as richly ornamented, but differently formed, to be seen. The archivolt, half of which is disclosed, shows simply a plain thick bead in a rectangular band. The large hall, which is 43 ft. long and 29 ft. wide, and on the longest side of which is the entrance, has a ceiling of timbers resting upon wooden bearers. The latter are supported by two square and bevelled stays of oak resting upon carved brackets, the hall being thus divided into three equal portions. Traces of window railings appear to be still existing at the left gable, but at present examination is difficult.

The hall in the first story corresponds to the lower one in size, as well as regards the construction of the ceiling and the wooden bearers and stays; but here three well-preserved windows of three round-arched openings each may be noticed in the façade. As usual in buildings of that period, there are no rebates. Each window shows right and left plain rectangular soffits; the round arches are also entirely without decoration, although each is turned very regularly, and consists of three very correctly-worked arch-stones. The intermediate supports of the different windows are formed in the case of the two to the left each by two round, in that of the one to the left by two octagon chamfered pillars. The latter are very slender, a symmetrical stone corbel jutting out on both sides, forming the connexion with the rather thick walls. The profile of the corbels consists, over the Romanesque foliage capitals, variously worked, of a hollow, small perpendicular slab, and round bead with slab over it. The thickness of the wall is flush with the latter. The capitals of the columns and octagon pillars end below in angular fillets; the bases show the attic profile, with plinth underneath. On the wall opposite to the window-front may be seen also plain sandstone slabs let in, which were probably intended as a support for a fireplace, not completed.

Great hopes are entertained that, after completely uncovering the building, more discoveries of architectural interest will be made. The ground-plan, as well as the position of the building in the centre of the old free-town of Gelnhausen, close to the church and the market-place, and the style itself, are said to justify the supposition that we have to deal here with the principal remains of its former town-hall, which would, in that case, probably form the oldest municipal building still in existence in Germany. The Romanesque forms of the building point to the conclusion that it was erected at about the same time as the celebrated

palace of the Emperor Frederick Barbarossa. The latter edifice, on an island in the Kinzig, near Gelnhausen, must have been completed about the year 1146.

The romantic ruins of the palace, surrounded by pretty gardens, and overgrown by luxurious ivy, are not esteemed and visited by archæologists and tourists as they deserve. Perhaps the recently discovered interesting remains of the building which form the subject of this note will draw renewed attention to the venerable town of Gelnhausen, once the scene of much imperial splendour.

NEW ENGINEERING WORKS, BELVEDERE ROAD.

Large new buildings are at present in course of erection in Belvedere-road, Lambeth, for Mr. Brotherhood, ironfounder and engineer, whose present works are in Compton-street, Goswell-road. The site of the new buildings adjoins the premises of Messrs. Lucas Bros., and was until recently occupied by Messrs. Holland & Hannen, who have removed their works to Nine Elms-lane. The buildings, and several workshops in connexion with them, will cover an area of about 20,000 superficial feet, having a frontage to Belvedere-road upwards of 80 ft. in length, with a depth to the river, including a spacious wharf, of 260 ft. The block facing Belvedere-road consists of a building, two stories in height, in stock brick and red-brick-arched window-heads and dressings. Above an arched gateway, 10 ft. in width, in the centre of the elevation, is a handsome projecting oriel window in Portland stone. Each side of the gateway entrance to the interior of the premises is faced with white and blue enamelled brick. This block will contain the drawing-room, pattern-room, and the several offices.

From the gateway entrance to the extreme boundary of the wharf on the margin of the river an iron floor and tramways are laid down along the centre of the enclosed area within, the several fitting and other works, with machinery, being on each side of the central tramways, and having wooden floors laid on a deep bed of concrete. Above these there are also galleries on each side containing similar workshops to those on the ground-floor. The floor of the upper workshops is composed of fireproof arches, resting on ranges of strong iron columns, 18 ft. in height, with lattice ironwork in front for protection. This portion of the building is 45 ft. in height, and is covered in with a glass and slate roof supported on iron trough-girders. The foundry portion is at the west end of the premises, in immediate connexion with the wharfage space. The engine and boiler house will be at the north-west angle, with two lofty chimney-shafts overlooking the river. The foundry will be 60 ft. in height, and covered in with a roof similar to that over the fitting-shops.

The architects of the buildings are Messrs. Hunt & Stewart, of Victoria-street, Westminster, and the contractors Messrs. Smith & Co., of South-street, Grosvenor-square. Mr. G. Crane is clerk of the works.

SCHOOL AT LATHOM.

The accompanying drawings represent a school in course of erection at Lathom, near Ormskirk, for, and at the sole cost of, the Right Hon. the Earl of Lathom, the children of whose tenants and workmen will receive a free education therein. It is being erected on the site of the old school (recently demolished), which, with its thatched roof and dormer lights, was of a very quaint and picturesque character, so much so that we consider the accompanying sketch may be of interest to some of our readers, reminding them of days gone by when the children instructed within its walls were taught to form their letters in sand, kept in a box in each desk for that purpose. Some of these desks (minus the sand) were in use up to the time of its demolition, a few weeks ago. The date of its erection cannot be ascertained, but no doubt exists as to its having been in use considerably over 120 years.

The site is immediately outside, and on the west side, of Lathom Park, and with all its surroundings is beautifully situate within half a mile of Lathom House, his lordship's seat, whilst on the north side, about 100 yards away, is the vicarage, erected by Lord Lathom about four years ago. Between the site and Lathom House, within the park, stand the private chapel, alms-houses, girls' school, and mistress's house, of which the following description is given by Mr. James Dixon, of Ormskirk, in his "Historical and Descriptive Sketch of Lathom Chapel," &c. He says, "The chapel at Lathom is ancient-looking and very pretty, standing at one angle of the quadrangular group formed by the chapel, almshouses, and girls' school, with mistress's school-house, all beautifully over-shadowed by chestnut and oak trees of centuries' growth. The interior of the chapel is very neat, nicely fitted up with benches, and having a very elegant pulpit, made a few years ago, from wood saved from the now demolished Burscough Priory. An eagle, in carved wood, was also replaced in the chapel, whence it is supposed formerly to have been taken, and is now again very properly used as a lectern. The windows in the chapel are of stained glass, the production of the Hon. Mary C. Bootle Wilbraham (now deceased), eldest daughter of the first Lord Skelmersdale, executed many years ago; the subjects are floral devices and armorial bearings of the Skelmersdale family and their alliances."

The plan to the left shows the arrangement of the new building; the schoolroom is 50 ft. by 20 ft., and the class-room 20 ft. by 18 ft., the floor of which, being raised 15 in. above the level of the school floor, and extending into the school about 3 ft., forms a platform for the master's desk, &c. There are two hat and cloak rooms, each 13 ft. by 8 ft. entered from separate open porches, and each having a door opening into the school and class rooms. The materials used in the erection are, externally, red bricks (made on the estate) with a very free use of hard Longridge stone for dressings; the roofs being covered with Welsh green slates. Internally the exposed woodwork is executed in pitch pine varnished; the ceiling of the school is divided into four bays, and that of the class-room into two bays, by carved wrought and moulded principals, exposed, and springing from moulded stone corbels; means for thorough ventilation are provided in the roof. The floors throughout will consist of pitch-pine blocks, in pattern, on a bed of concrete, 6 in. thick. There will be round the school and class rooms an ornamental dado of glazed tiles, 4 ft. 3 in. high. The hat and cloak room will have a pitch-pine dado, 5 ft. 3 in. high, with hat-pegs. All the walls above the dado will be plastered. The windows throughout will be glazed with Hartley's quarry-marked glass. The class-room will be divided from the school by means of Clark's pitch-pine patent revolving shutters. The accommodation is for upwards of 200 children. The work is being executed by the contractor, Mr. Thomas Riding, of Ormskirk, from the plans (approved by the Education Department), and under the superintendence of, the architect, Mr. Thomas Kissack, of Ormskirk and Southport.

THE NEW TOWN-HALL, VIENNA.

Our readers have been kept well informed as to the large architectural works now in progress in Vienna. Foremost amongst them is the Town-hall, now making rapid progress, of which we have on various occasions spoken, illustrating a portion of it a few years ago. We now give a view of the whole, with sketches of the Banqueting Hall (on the left side), and the chapel. To prevent the necessity for reference, we repeat some of the particulars. The architect, Herr Friedrich Schmidt, now deservedly eminent in Germany, was selected in competition in 1868. His works, we may say, are very numerous. Besides the restoration of St. Stephen's (including the partial rebuilding of the tower), which he brought to its completion, he is the architect of most of the new churches of Vienna. The plans for restoring the castles of Vajda Hunyad in Transylvania, and Karlstein in Bohemia, are also by him.

The Vienna Rathhaus, which was commenced in 1872, forms a parallelogram 505 ft. long and 407 ft. broad, and occupies an area of 205,535 square feet (nearly five acres). The space inclosed by the four façades is divided by two larger and four smaller blocks into seven courts, of which the inner one extends to a length of 260 ft., and a breadth of 115 ft. throughout the entire depth of the interior space, while both to the right and left are placed three courts of various sizes. The style of the building is Gothic, with a leaning towards that development which Gothic architecture presents in Upper Italy. All the blocks have five stories; in the principal façade the two ground-stories are combined into one by an arcade. The lower stories are appropriated to the various offices most used by the public, while the principal floor contains the banqueting and other public halls, with refreshment-rooms, as well as the meeting-halls of the Town Council and the executive. The upper story is occupied by the museum of arms of the city, the archives, &c. The principal staircases are in the centre blocks.

The centre of the building projects from the front by a second row of arcades, and is raised upon a flight of fourteen steps. The tower, 351 ft. high, juts out further from the middle part. Passing through the arcades, a vaulted hall of 112 ft. long and 36 ft. wide is entered. Remarkable for their size are also the banqueting-hall, of an area of 11,645 square feet, and 44 ft. high, with an open loggia along its whole length, and a smaller room in the tower; and the great meeting-hall of the Town Council, of an area of 3,714 square feet, extending through two stories, with galleries on three sides.

All the outside façades are erected in free-stone; those of the courts, from the entresol upwards, in brick with terra-cotta ornaments. All the roofs and ceilings, with the exception of those of the halls and corridors, which are spanned by groined vaulting, are of iron.

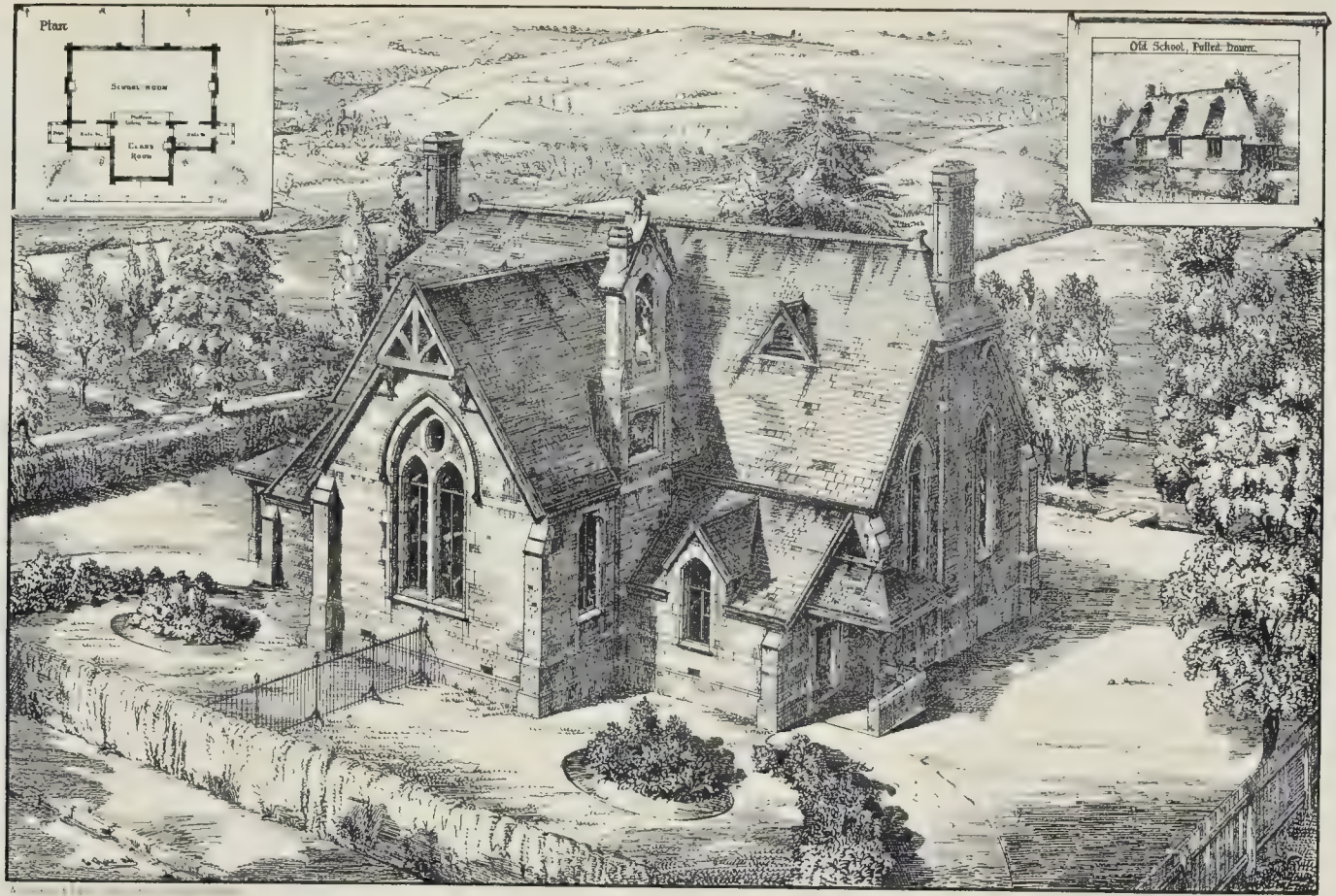
In accordance with the views and resolutions of a commission of experts specially appointed for the purpose, the interior decoration of the town-hall is to be carried out in an historical sense. Allegory is to be avoided as much as possible. The decoration has been confided to old and young artists alike, with whose work no special fault can be found. Hans Makart is to paint three frescoes for the ceiling of the banqueting-hall (Reconstruction of Vienna; Science and Arts; Commerce, Traffic, and Trades). At the window-piers will be placed statues of historical personages renowned in the annals of Vienna (for instance, Starhenberg, Solm, &c.), and over them mosaics (portraits of Beethoven, Mozart, van Swieten, Raffaelle, Donner, Grillparzer, &c.). The statues will be the works of the sculptors Weyer, Tilgner, Wagner, and others; the mosaic portraits will be executed after cartoons by Trenkwald, Julius Schmidt, and other artists. The space above the orchestra will be filled with medallion portraits of Raimund, Schubert, Strauss, &c. The ceiling of the hall of representatives will contain a picture of the siege of Vienna by the Turks, by the battle-painter, S. L'Allemand. The council-chamber of the municipality will have a frieze-like decoration in the form of a series of pictures representative of the history of Viennese life (for example, the opening of the Prater at the time of Maria Theresia) by K. Karga and Jul. Berger. The refreshment-room receives a frieze by Professors Laufberger and E. F. Steinle. A life-size portrait of the emperor, by H. v. Angeli, will be placed in the hall of representatives.

CRICKET PAVILION, PETERSFIELD.

This pavilion, recently completed, has been erected by public subscription in the picturesque locality of Petersfield Heath, for the Petersfield Cricket Club. The building is constructed with split fir-poles, the bark being left on. The whole is carried upon a brick and concrete foundation. A continuous oak sill rests upon the wall at the ground level, into which the uprights forming the superstructure are securely framed. The interior is lined with 1½-in. framing, the panels being filled in with 1-in. beaded boarding. The roofs are covered with "withy chips" about 1 in. wide, ½ in. thick, and 1 ft. 6 in. long, fixed in the same manner as ordinary thatch; the ridges being capped with straw.

The building was erected by Mr. J. Maxwell, under the superintendence of the architect, Mr. John Luker, of London and Petersfield, at a total cost of 190*l*.

Crystal Palace School of Gardening.—Mr. F. A. Fawkes (author of a work on Horticultural Buildings, lately mentioned in our pages), is to give a course of three lectures to the students and the public at the Crystal Palace on November 16th, 23rd, and 30th, at five p.m. The lectures will treat of horticultural buildings, their details of construction, fittings, heating, and so forth.



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School at Lathom, for The Right Hon. the Earl of Lathom.

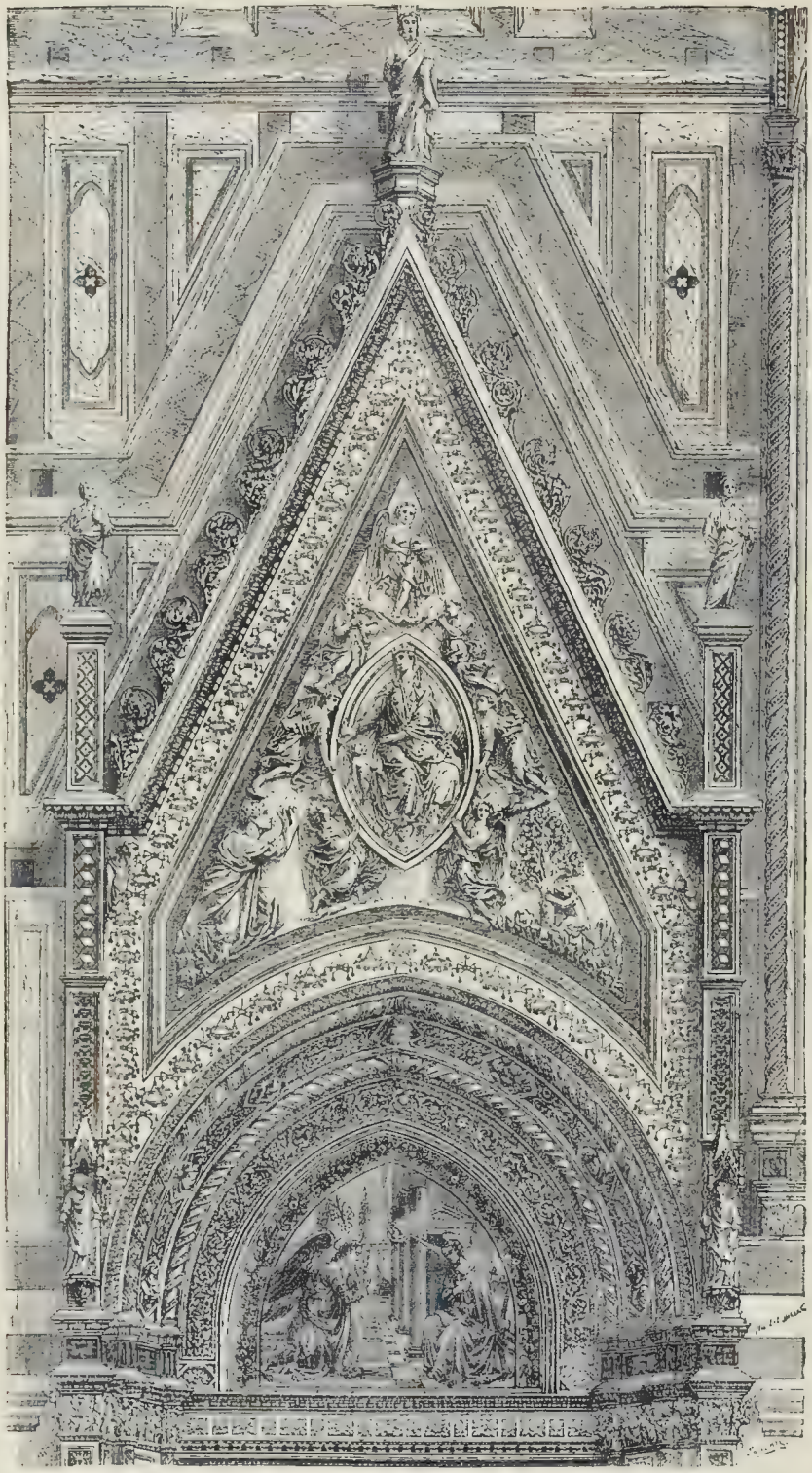
Thos. Kissack, Architect, Bromsgrove & Southport.



THE NEW TOWN HALL, VIE

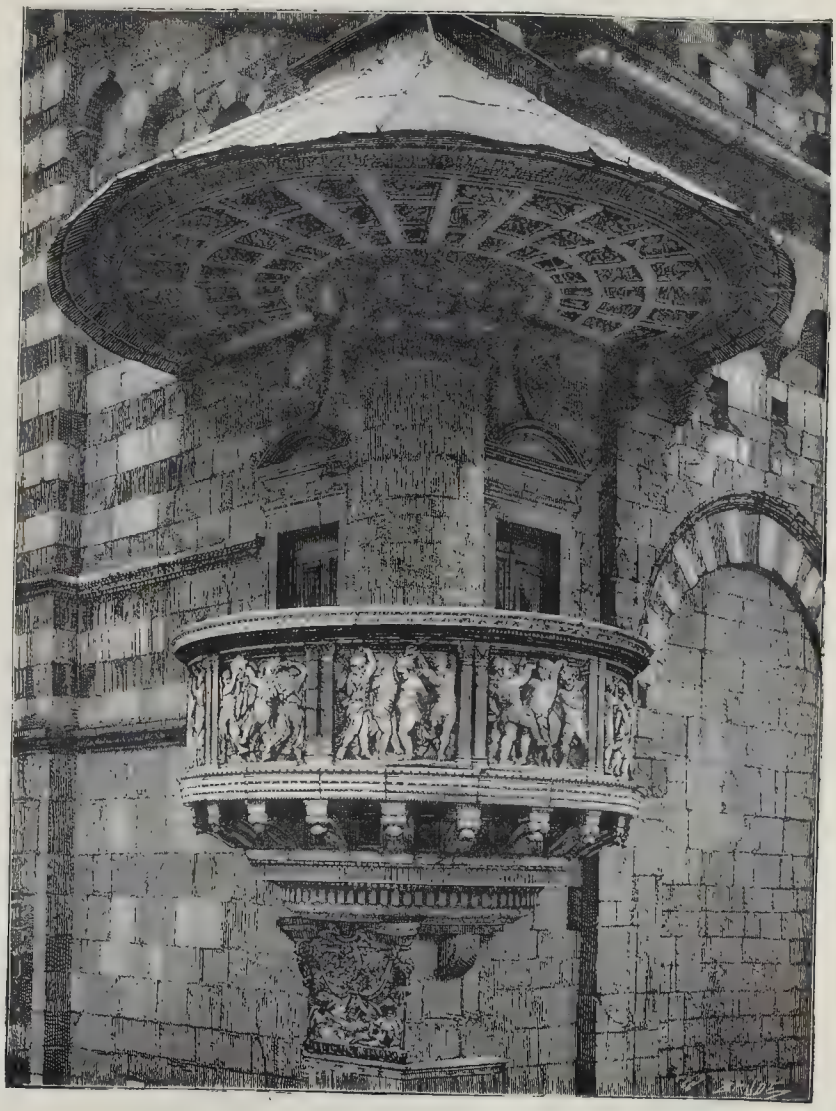


r Friedrich Schmidt, Architect.



FLORENCE CATHEDRAL: SCULPTURE OVER THE "PORTA DEI SERVI

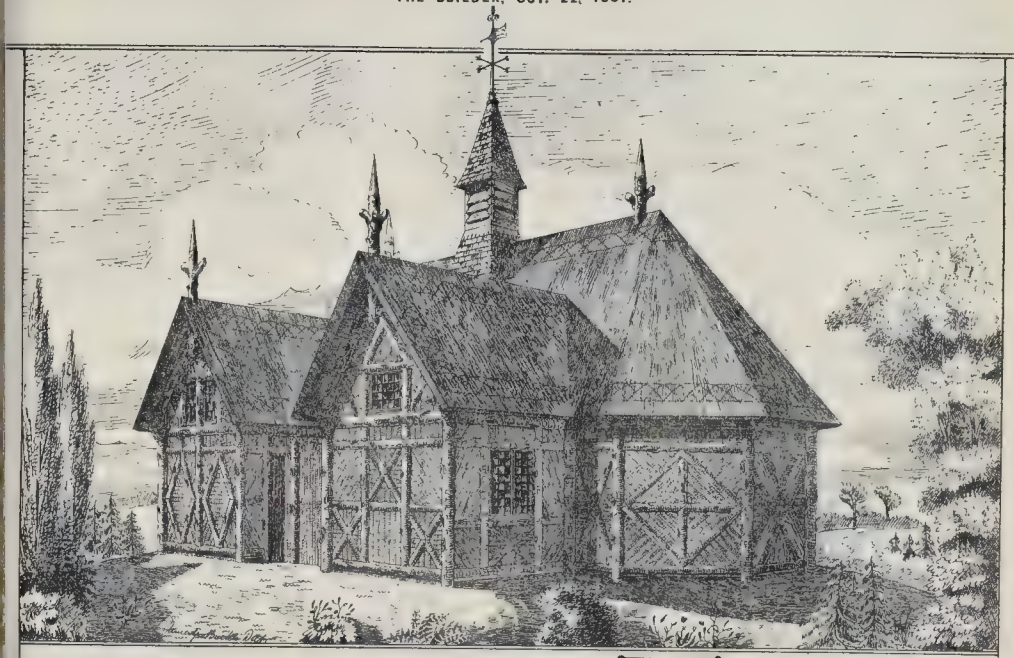
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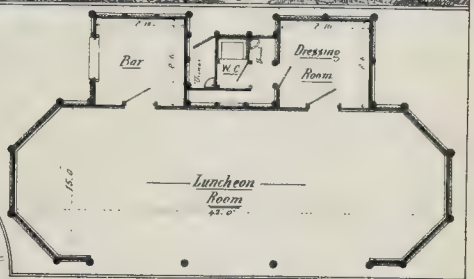
EXTERNAL PULPIT AT THE CATHEDRAL OF PRATO, NEAR FLORENCE.

The Work of Donatello and Michele di Bartolommeo.

[See p. 505, *ante*.



CRICKET PAVILION PETERSFIELD





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BUILDING NOTES FROM THE WEST OF ENGLAND.

The building trade in the West of England is, if anything, rather better than it has been. The improvement is nothing remarkable, but prospects look healthier than formerly. Amongst various matters which have been engaging attention may be mentioned the following:—

The foundation-stone of St. Saviour's, Woolcott Park, Bristol, was laid a few days ago. For several years an iron building has been in use, and the one which is to supersede this is in the Early Pointed style. The exterior walls are of Pennant stone, with Bath stone dressings. At the west end and springing from the gable will be a bell-turret, rising 80 ft. from the ground; it will have at its apex a canopied niche, containing a figure of Christ the Good Shepherd. There will be little attempt at ornamentation. The interior will consist of nave, north and south aisles, chancel, organ-chamber, vestries on the north, and a transept on the south side. The width of the nave from wall to wall will be 54 ft., and from the chancel to the western extremity the length will be 93 ft. The height to the apex of roof will be 58 ft. The chancel is to be 38 ft. long by 25 ft. wide, and 52 ft. high. The chancel arch will be 20 ft. wide, and 38 ft. high to its keystone. Dividing the nave from the aisles on each side, six arches, with carved capitals and of bold design, will be erected. The total cost of the work is estimated at 4,839*l.*, and the new church will provide seats for 834 persons. Mr. John Beaven is the architect, and the contract has been taken by Mr. Cowlin.

The council of Bristol some time ago decided to erect a new bridge crossing the Avon from Bedminster, a parish of about 30,000 inhabitants. Mr. Ashmead, the city engineer, has just completed his plans for the new structure. His designs are for a bridge with bow-string or lattice girders, one on each side of the bridge, the roadway being supported by cross girders. The rise of the present bridge would be reduced 1 ft., and the width and strength would be considerably greater. The Corporation have approved of the plans and fixed the width at 40 ft. for the carriage-way, and 7 ft. for the pavements.

On October 13th, an addition to the many fine churches in Bristol was opened—St. Mary's, Tyndall's Park. The building has been carried out in instalments, the foundation stone having been laid as long ago as November, 1870. The church is now complete, with the exception of the tower. It is in the Decorated style of the middle of the fourteenth century, and is built of local sandstone. The chancel is 39 ft. long, 24 ft. wide, and 58 ft. high to the apex of the roof. The east window, of tracery work, measures 25 ft. by 15 ft., and contains five lights. The transepts, which are 21ft. 6in. long and 18ft. wide, project from the chancel, into which they open by arches springing from clustered shafts of serpentine, bearing carved caps. The chancel arch is 22 ft. wide and 35 ft. high, the jambs being shafted with polished red Dartmoor granite. There are also western arches from the transepts to the nave aisles, each 11 ft. wide and 14 ft. in height. The full length of the nave is 84 ft., and it is 26 ft. wide, with four bold arches on each side 22 ft. high and 20 ft. wide, springing from circular shafts with moulded bases and carved caps. The arcades support the clearstory, with a three-light window over the apex of each arch. To the apex of the roof the height of the nave is 64 ft. On each side of the nave are lean-to aisles, 12 ft. in width. The north window is of stained glass by Messrs. Burlison & Grylls, of Newman-street, London, the subject being Our Lord in his Subjection to his Parents. Some of the internal carvings, by Mr. E. Sheppard (Bristol) from his own designs, are very effective. The cost of the third instalment of the work has been 3,700*l.*, and about 2,000*l.* are required for the tower. The cost of the two first instalments was large, and 1,000*l.* were paid for the site. Mr. J. Piers St. Aubyn was the architect for the work, and Messrs. Stephens & Bastow were the contractors for the concluding portion.

Rather a novel claim, interesting to builders, has occupied the attention of the Gloucester county magistrates. The Gloucester Highway Board charged Mr. Albert Estcourt, builder and contractor, 41*l.* 13*s.* for extraordinary traffic on the roads. The builder was carrying out a contract of 10,000*l.* for the erection of additional buildings at the Barnwood House Asylum, and it was alleged that the extra wear of the roads had resulted from the hauling of his building materials. Other builders had also caused extra wear, and it was understood they would, if the Board gained their point in this case, have claims sent to them. It was stated that 313 extra tons of stone had to be used in road repairs in consequence of the extra traffic. It was contended that Mr. Estcourt's traffic was not such as was intended by the Legislature to be termed "extraordinary," and the magistrates dismissed the claim of the Highway Board.

A new Jews' synagogue has been opened at Uplands, Stroud.

The engineers of the Great Western Railway have been examining the ground for a new line from the Quaker's-yard Junction, on the western side of the Taff Valley, up to Merthyr. The chief object is said to be to get access to some extensive collieries.

A new coffee hotel, erected at a cost of 3,300*l.*, has been opened by the Bishop of Bath and Wells, at Taunton. The building is for the Taunton Coffee Tavern Company, Limited. Mr. C. H. Samson was the architect, and Mr. Templeman the builder.

As stated in the *Builder* a month ago, efforts are being made to provide a new pier for Weston-super-Mare. Two plans have been obtained since then, and each proposes a pier a mile and a quarter in length, this great length being necessary to obtain a depth of 7 ft. of water at low tides. The plan of Messrs. P. Munro & Son, Bristol, proposes an octagonal head and 129 spans of 59 ft. each, measuring from centre to centre of the columns. All the girders in the elevation of the pier would be continuously connected, and would be furnished at each end with a pair of vertical angle-irons, and bolted together with six bolts, a piece of felt soaked in tar being inserted in the joint. The abutments and wing-walls would be of local stone, set in cement. The pier-head would be supported on piles. The cost Messrs. Munro put at 40,000*l.*, exclusive of expenses of promotion. Mr. Scoones (Bristol), who supplied the second plan, estimated the cost of a pier built in the ordinary way at 60,000*l.* or 70,000*l.*, but the special method of construction he advocated he estimated at 38,225*l.*; this amount including the pier, tramway along it, landing-stage, refreshment-room, bazaar, and band-stand. The engineer does not propose one continuous structure, but says additional safety would be obtained by dividing the length into eight spans, each of which would be stronger than the rest of the pier. The materials would be wrought iron, and the structure on the trussed principle successfully adopted in America. The matter has been referred to a committee to see if there are any legal difficulties in the way of a new pier.

A new church institute has been opened in Weston-super-mare, the total cost of which, with site and furnishing, was 2,300*l.*

The Masonic Hall is another new building just completed in the same town. Messrs. Hans, Price, & Wooler were the architects, and Mr. S. T. Harvey was the builder.

A Methodist Free Church schoolroom has been commenced at St. George's, Gloucestershire. It is of Pennant stone, with freestone dressings. It matches the chapel it adjoins, and the cost will be about 1,000*l.*

The foundation-stone of a mission-room in the Dings, Bristol, has been laid. The cost will be 650*l.*

NEW HIGH SCHOOL FOR BOYS AT OXFORD.

The New High School for Boys, situate in New Inn Hall-street and George-street, Oxford, was formally opened on the 15th ult. (as already briefly mentioned by us). We quote from the *Oxford Journal* some particulars of the building. The site, buildings, and other property of the school are vested in the Corporation of the city, in trust for the purposes of the school; but if the school should ever cease to be used as such, then the buildings and site revert to the Corporation, to be held by them for municipal purposes. The school is to be open,—without regard to social position or religious opinion,—to all boys residing in Oxford and the neighbourhood who shall have attained the age of eight years, are of good character, able to read simple narrative, and write text hand, and show some knowledge of the first four rules of arithmetic. There are reserved fifty Free Scholarships, which are tenable for three years, and are to be filled up as the funds at the disposal of the Governors allow. Thirty of these Free Scholarships are to be held by boys under twelve years coming from the elementary schools of the city. The remaining twenty are to be held by boys already in the school, of ages set forth in the scheme. The Scholarships are to be competed for on examinations, for which due provisions are made in the scheme. The site, which was provided by the Corporation free of charge, lies between New Inn Hall-street, George-street, and Bulwark's-alley, and is bounded on the south by the old city wall and bastion. The chief access for the boys is from New Inn Hall-street, whence they at once reach the playground. The chief face of the building fronts George-street. The Governing Body, before determining on an architect, invited three gentlemen to send in designs, and eventually entrusted the designing of the buildings to Mr. T. G. Jackson, M.A., of Wadham College, Oxford. Keeping in view the limited funds at present at their disposal, the Governing Body resolved to build at first only the principal school-room and four class-rooms; and as soon as the specifications and quantities for this portion of the proposed buildings were complete, they invited tenders from thirteen builders in Oxford and elsewhere, and accepted that of Mr. C. Claridge, of Banbury, amounting to 7,480*l.*, which was the lowest. The building has a frontage to George-street of about 120 ft., and is recessed to form a forecourt, behind which is the principal block, occupying the whole width of the frontage, and containing four class-rooms, below which is a hall about 84 ft. by 28 ft., and a projecting building in front, containing the principal staircase and entrance porch, with a Decorated gable and lanterns above. There is a second staircase at the west end of the hall, with an entrance from the south. For the present this building will not be carried beyond this point, but according to the plan, a long wing containing class-rooms and corridors will ultimately extend westwards, behind, and parallel to the houses in George-street. By this arrangement of the building, a large extent of ground will be left available for a playground between the school buildings and the old city wall, with an entrance from New Inn Hall-street and another from Bulwark's-alley. The plan, when completed, will include a house for the head master, and possibly new Science and Art Schools may be built on a part of the site, for the use both of the High School and of the townspeople generally. The great hall is panelled with wood to a considerable height, and the doorcases are surmounted by the city arms. A large fireplace and chimneypiece form the principal feature of one end, designed more for the appearance of comfort that an open fire gives than for actual necessity, for the whole building is fitted with hot-water pipes, and artificially ventilated. The city arms also appear sculptured on the George-street front, with the mottoes of the town and the University, "*Fortis et Veritas*" and "*Dominus Illuminatio Mea.*" In the gable above is a large enamelled clock-face, and the whole is surmounted by a lantern containing the clock-weights and the bell.

Messrs. Farmer & Brindley have executed the carving; Messrs. Haden, of Trowbridge, supplied the heating and ventilating apparatus; and Mr. Rowell, of Oxford, the clock.

PROPOSED TREATMENT OF LONDON SEWAGE.

At the meeting of the Metropolitan Board of Works, on the 14th inst., the Works and General Purposes Committee presented a report as to a letter from Mr. C. Deavin, regarding some suggestions made by him for dealing with the sewage of the metropolis, so as to minimise as far as possible the pollution of the Thames. Mr. Deavin proposes that in the neighbourhood of the main drainage outfalls a series of reservoirs should be constructed, sufficiently large to receive, say, a daily discharge of the sewage. On the banks of the reservoirs should be placed at certain intervals lime-kilns for burning a sufficient quantity of lime to disinfect the sewage. When the reservoirs were fully charged with sewage the lime should be shot into them, and "by some mechanical contrivance propelled by steam," the lime and the sewage could be mixed together, and when the mixture had settled, the watery portion could be passed into the Thames, while the sediment or sludge at the bottom of the reservoirs might be lifted by machinery into

tanks constructed of iron placed on the top of the kilns, the fire beneath being utilised for drying the sludge, which would then be reduced to a portable state and utilised for fertilising purposes.

The Works Committee recommended that Mr. Deavin be informed that the Board do not consider that past experience would justify the adoption of the process which Mr. Deavin suggests.

The report was adopted, after some discussion, in the course of which Mr. Richardson said that, sooner or later, the Board would have to do something in regard to this question. He should have liked to have Mr. Deavin's proposal referred to the chemist for consideration.

The Works Committee, we believe, acted on the advice of the Engineer of the Board, Sir Joseph Bazalgette, who pointed out that the lime process of precipitation was no new thing, having been in operation, with more or less success, for the last thirty or forty years, but that in every instance it had been attended with great cost, and the residue was not of the value supposed by Mr. Deavin.

NEW SCHOOL BUILDINGS AND MISSION ROOM IN KENNINGTON.

Two large blocks of new buildings are at present in course of erection in Camberwell New-road and James-street, Kennington, in connexion with the Church of St. John the Divine, Vassall-road, to which there are already attached middle-class and parochial schools, together with a spacious mission chapel, all of which have, from time to time, been erected at a considerable outlay, in addition to the handsome church itself (from designs by Mr. G. E. Street), which, although the tower and spire have not yet been built, has already cost about 20,000*l*. The new buildings in question consist of an enlargement of the existing schools in Camberwell New-road to about double their present dimensions, by the erection of a block containing two additional school-rooms, 40 ft. by 25 ft. each. The other block, having its main frontage to James-street, and in immediate contiguity to the school buildings just referred to, consists of an entirely new and distinct building, containing an infants' school and class-rooms on the ground-floor, and a spacious mission-room on the floor above, the building likewise including a convenient residence for the caretaker in charge of the several schools. The building, which is faced with stock brick and red brick dressings, has an elevation to James-street upwards of 70 ft. in length, and is in the Gothic style of architecture, surmounted by three lofty gables, two of which are 45 ft. in height, the gable at the south end of the block, which contains the caretaker's residence, rising to a height of 55 ft. It has a high-pitched roof, in which there are three dormers. The mission room is 25 ft. in height, and is lighted by two three-light windows in the James-street frontage, and a large four-light window at the north end, the lower portion of the three dormers above-named also contributing to light the room, whilst the upper portion serves ventilating purposes.

Mr. F. W. Hunt, of Upper Baker-street, is the architect; and Mr. Tyerman, of Walworth-road, the contractor. Mr. A. Cox is clerk of the works, and Mr. G. S. Double the foreman. The cost of the buildings will be about 6,000*l*., which it is stated will be defrayed by the Rev. C. E. Brooke, the vicar of St. John's, at whose expense, mainly, the church and other buildings in connexion with it have been erected.

BIRMINGHAM.

One of the most recent additions to the architectural features of this town, the new Central Arcade, extending from Corporation-street to Cannon-street, is now completed. It has been erected for the proprietor under the superintendence of Mr. W. H. Ward, architect, the style adopted being a free treatment of the Renaissance. The whole of the interior is faced with stone, with the introduction between the shops of granite pillars; and springing from these at the top of the Arcade are some light iron principals, carrying a roof, which is filled with stained glass. There is a liberal decoration in gold and colour on the flatings and frieze. The shops are convenient, and the offices above have easy access from the street. Underneath the shops, with entrances both from Corporation-street and Cannon-street, is the new Central Restaurant and Grill-room, which is lighted by means of a glass and iron roof, which forms the floor of the Arcade. There is a double row of gas-pendants on each side of the avenue, and each pendant is furnished with an opal lamp. In addition to the ordinary lights in the Arcade, there are clusters of lights at each entrance.

The contract for the erection of the building has been carried out by Mr. J. Garlick. The whole of the glasswork was erected by Messrs. J. & O. C. Hawkes, of Bromsgrove-street; and the ornamental wrought-iron gates were manufactured by Mr. T. Brawn, of Clement-street.

SLATE QUARRYING.

At the last meeting of the Liverpool Engineering Society, at the Royal Institution, Colquitt-street, a paper on "Slate Quarrying" was read by Mr. C. H. Darbishire, Assoc.-M. Inst. C.E. It dealt chiefly with slate quarrying as carried on in the Nantle Valley, and the several beds or veins of slate that are worked therein. The author commenced by alluding to the rock as having been formed of great deposits of mud in water, composed chiefly of silica and alumina, which have been subjected to immense pressure and volcanic convulsion. The split of the slate is attributed in a great measure to the effects of the great pressure. The paper further described the several means of opening quarries whether on the hill sides or on the flat, and alluded to the different lifting apparatuses in common use, advocating inclines instead of the old-fashioned guide-ropes and hauling-chain. Attention was called to the system of bargains, under which practically all roofing slates are made, as well as the duties undertaken by the rock-men and quarry-men respectively, and their tools. The ordinary sawing machinery was described, as well as the dressing-machines in vogue, preference being given to the one invented by the late Mr. Greaves. The explosives mentioned were powder, nitro-glycerine, dynamite, and gun-cotton, all being more or less employed, with the exception of nitro-glycerine, the use of which has now been almost entirely abandoned. In pure slate the common black powder only is burned. The author concluded by pointing out that a quarry venture is not necessarily a success because there happens to be some good splitting slate found therein, but thought that if sufficient good rock is found few ventures are so safe or so lasting.

THE EAST-END BRIDGE PROJECT.

Some of the ward associations interested in the East End are taking steps with the view of again bringing the subject of a new bridge east of London Bridge before the public authorities, and last week a deputation from the Aldgate Ward Association discussed the matter at a meeting of the Portsoken Ward Association. It was urged that, as the Inner Circle Railway was now in a fair way of being completed, it was time that the East End of London should be benefited by the erection of an eastern bridge. Mr. Lefevre, C.E., who formed one of the deputation, said he appeared there as a member of his association, and not as an engineer. In supporting the project, however, he made some remarks of an engineering character, expressing himself in favour of a low-level bridge, which he asserted could be swung round by means of electricity in about half a minute. In the discussion which followed, the necessity for the construction of the bridge was strongly urged, and a resolution was adopted to the effect that it was desirable that a bridge should be erected as quickly as possible east of London Bridge.

The Meetings of the Institution of Civil Engineers will be resumed on the 8th day of November. There will be twenty-six meetings during the ensuing session, and these will be held weekly until the end of May. The Institution is now in telephonic communication with the Exchange System of the United Telephone Company, and its registered telegraphic address is "Institution, London." There has lately been forwarded to the members of all classes the sixty-sixth volume of the "Minutes of Proceedings," being the fourth, and concluding, part for the present year, as well as a Subject-matter Index to the whole of the publications of the Institution, from 1837 to the end of the session 1878-79.

THE PROSPECTIVE UTILISATION OF GAS.

In view of the introduction of the electric light for illuminating purposes there appear strong reasons for believing that gas will at no distant day be utilised for several other purposes besides that of lighting, which, however, it may be expected long to retain. At the half-yearly meeting of the London Gas Company, held last week, the Chairman observed that in spite of the electric light the company had, in the half-year under review, had an increase at the rate of 3 per cent., whilst, in the quarter just expired the increase had been 4¼ per cent., which seemed to show that the electric light was greatly beneficial. The directors, he remarked, found that the use of gas for engines and cooking purposes was greatly increasing. Up to Lady Day, 1880, they were supplying twenty-five engines, but at the present time the number was between fifty and sixty. At the date named they had also forty cooking-stoves heated by their gas, whilst the number was now fully 2,000. Altogether they had some 3,000 machines of different sorts running in their district, independent of lighting, and the number was increasing almost daily. He added that they had received that day an application from one of the electric light companies for the supply of an eighty-light meter. He did not know what they were going to do with it, but this fact demonstrated that even the electric light companies could not do without the use of gas.

THE ST. GEORGE THE MARTYR BATHS AND WASHHOUSES.

There appears to be a probability of the remaining wing of old St. Thomas's Hospital being converted into baths and washhouses for the parish of St. George the Martyr, Southwark. Several years ago the Baths and Washhouses Act was adopted by the parish, and commissioners under the Act were appointed, but hitherto they have not been able to acquire a site, although several have from time to time been named, including a portion of the sites of the old Queen's Bench and Horsemonger-lane Gaol respectively. It is new, however, stated that the owners of the old hospital buildings still standing are willing to dispose of them with the view of their undergoing reconstruction for bath and washhouse purposes, and that negotiations are now going forward between the Commissioners and the owners of the disused hospital, which are likely to result in the purchase of the buildings by the Vestry, and their immediate conversion into public baths.

OBITUARY.

Sig. Raphael Monti, the Sculptor, died in London on Sunday last, aged sixty-three. A native of Milan, he studied sculpture under his father, Gaetano Monti, and at an early age won the Gold Medal of the Imperial Academy in that city by a group of "Alexander Taming Bucephalus." His next considerable work, "Ajax defending the body of Patroclus," was exhibited before he was grown up. Between 1838 and 1842 he resided at Vienna, and between 1842 and 1847 was occupied with several groups designed to add to the attractions of Milan. In the last-mentioned year he came to England, where his "veiled statue," executed at the instance of the Duke of Devonshire, elicited high praise. Returning soon afterwards to Milan, he gave in his adherence to the popular party, and in 1848, as one of the chiefs of the National Guard, was sent on a mission to the camp of Charles Albert. The war over, he again came to England, and from that time devoted himself to his art. His decease is much lamented by his friends and pupils.

St. Leonard's-on-Sea.—With reference to the building here mentioned last week (p. 497, *ante*) as "A New Hospital for Poor Children," we are informed by the architects, Messrs. Fowler & Hill, that its right designation is the Convalescent Home for Poor Children. The institution is not a new one, having been in existence some years, and was established to afford good air and nourishment to convalescent children from London and other large towns, who have been suffering from non-infectious maladies.

PROJECT FOR A SECOND THAMES TUNNEL.

At the meeting of the Metropolitan Board of Works on the 14th inst., a letter was read from the Limehouse District Board of Works submitting for the consideration of the Board a plan (suggested by the Surveyor of the Limehouse District) of a proposed subway communication between the north and south sides of the river eastward of London Bridge. The proposed subway would form a communication between the Commercial-road East and Lower-road, Rotherhithe. The subway is proposed to be constructed as a double tunnel, each passage sufficient to accommodate one line of vehicles, with frequent communication between the passages, which, it is suggested, should be lined with white glazed bricks, and lighted by the electric light. There would be two shafts near the river, one on each side, for the ascent and descent of foot-passengers. On account of the difference of level on the north side, it is proposed to approach the tunnel "by two elliptic spirals of a diameter of 550 ft. and 480 ft. respectively." The length of the proposed subway on the south side of the river would be 1,317 yards; under the river, 392 yards; and on the north side, 1,802 yards,—making a total of nearly two miles. The gradients of the subway would vary from 1 in 90 to 1 in 50.

The letter was referred to the Works Committee for consideration and report.

THE ANGLO-AMERICAN ELECTRIC LIGHT COMPANY'S OFFICES.

Within the last few days the Anglo-American Electric Light Company have opened the new office buildings which have just been erected for them on the east side of Belvedere-road, immediately in front of the company's works, and close to where the Charing-cross section of the South-Eastern Railway crosses over that thoroughfare. The building has a prominent frontage to Belvedere-road containing three floors and a basement, and is about 80 ft. in length. The materials of the building are white and red brick, with Portland cement dressings, and in that material, between the second and third floors, is the following inscription:—"The Anglo-American Brush Electric Light Corporation, Limited, Victoria Works." The general offices of the company are on the ground-floor, the manager's and engineer's offices being on the floor immediately above. The board-room is also on this floor, and is the principal apartment in the building. Its dimensions are 30 ft. by 18 ft., and it is the only room in the building which will be heated by the ordinary fire-stove, all the other apartments being intended to be heated by hot-air pipes. The offices will be illuminated throughout by the electric light.

Mr. J. Tillott, of Basinghall-street, is the architect of the building, and Mr. W. Brass, of Old-street, is the contractor, Mr. Weston being clerk of the works.

ASPHALTE AS A DAMP PREVENTER.

An interesting example of the application of Claridge's Asphalte to keep down damp is to be seen in South Audley-street, near Chesterfield-gardens, where the erection of a large house, from the designs of Messrs. Crickmay & Sons, has just now been commenced by Messrs. McLachlan & Sons. The soil in the immediate neighbourhood is affected by land springs, and in this particular case, moreover, the basement is taken down much lower than adjoining basements, so that the water-course was cut and made itself evident in various parts. Extra precautions were, therefore, necessary to secure dryness, and these have been taken. The whole site of the mansion is covered with Pyrimont Seyssel asphalte, of fine quality, ½ in. in thickness, carefully laid by the company's workmen on a bed of cement concrete. The foundation walls are built on the asphalte. The footings of the walls are covered on the outside, and the outside face of walls is covered up to ground level. The building may be said, as to foundations and road level, to be built in a huge cistern of brickwork, having a ½ in. floor of asphalte all over it, and under footings, carried up the two sides and two ends externally with a like thickness of asphalte; in all to the extent of about 7,500 ft. super. Later on the building will have a flat roof of tile arches, covered with asphalte.

Mr. Farrell, on the part of the company, has just now issued a little book, entitled "On the Uses and Fireproof Properties of Claridge's Patent Asphalte," which gives a list of the purposes to which it may be advantageously applied, and describes, with diagrams, the modes of application. We find quoted in it favourable opinions of the material expressed by ourselves more than a dozen years ago, and more recent experience has in no degree changed these opinions. Care should, of course, be taken to ensure the use of the right material.

DEMOLITION OF ILLEGALLY-BUILT HOUSES.

For some time past a dispute has been going on between the Camberwell Vestry and Mr. Nunn, the Vestry's complaint being that Mr. Nunn was contravening the provisions of the Metropolitan Building Act by erecting a number of houses in Choumert-road, Peckham, beyond the authorised building line. Mr. Nunn was summoned by the surveyor before Mr. Ellison, at the Lambeth police-court, when, on the case being heard, the magistrate ordered the terms of the Building Act to be complied with, and in the event of the order not being obeyed, he authorised the Vestry to demolish the houses. Mr. Nunn not having conformed to the magistrate's decision, the Vestry have taken the matter into their own hands, and at last week's meeting the General Purposes Committee reported that the surveyor had carried out the order of Mr. Ellison by having the houses demolished. Mr. Sugden observed that they were all pleased at the fact that the surveyor had vindicated the law, and that determination had been shown that Mr. Nunn should not set them at defiance; but he thought that the Vestry should show sympathy with one of the tenants on the estate, who had greatly suffered in consequence of the course which the Vestry had been compelled to take. Mr. Middlemass, in reply, said the tenant's action was against Mr. Nunn and not against the Vestry.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,219. J. Hill, London. Securing knobs to spindles for door-locks, latches, &c. Sept. 30, 1881.

4,226. C. Hook, Bridgwater. Window-sashes and frames. Sept. 30, 1881.

4,257. J. Wadsworth, Manchester. Gas-heating stoves, &c. Oct. 1, 1881.

4,270. E. A. Brydges, Berlin. Pneumatic method of constructing foundations for the piers of bridges and other structures. (Com. by G. Gregersen, Buda-Pest, Hungary.) Oct. 1, 1881.

4,297. B. D. Healey, Brighouse. Asphalte apparatus. (Com. Spec.) Oct. 4, 1881.

4,335. W. R. Kinipple, Westminster. Construction of harbours, breakwaters, docks, &c. Oct. 5, 1881.

4,342. T. Fletcher, Warrington. Gas stoves for heating purposes. Oct. 6, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

Oct. 4, 1881.

2,351. T. A. Brocklebank, London. Putting together steps or stairs, flooring, &c. May 28, 1881.

2,453. J. Herd, Birmingham. Roadways, pavements, &c. June 3, 1881.

3,863. G. Jobson, Derby. Ornamental tiles, &c. Sept. 6, 1881.

Oct. 7, 1881.

2,628. W. W. Beaumont, Camberwell, and J. Wellman, Poole. Apparatus for dressing and cutting stone, &c. June 16, 1881.

3,629. C. Drake, Battersea. Baths. Aug. 20, 1881.

3,911. J. Wetter, New Wandsworth. Reflectors (Com. by W. Wheeler, Massachussets, U.S.A.) Sept. 9, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending October 8, 1881.

529. B. C. D. Greenhill, Puriton. Machinery for pressing with perforations bricks, tiles, &c.

A cube of clay is pressed into a die by a lever or wheel which acts upon an eccentric, and the same motion simultaneously brings down a series of plungers which perforate the brick. The reverse motion liberates the perforated brick. Feb. 8, 1881. Price 4d.

778. E. O. Mundy, Stratford. Valves or apparatus for preventing waste of water.

A hollow ball of indiarubber works in a guide covered with perforated metal. The lower valve is kept in position by a guide tube working in a bridge piece in the seating. The hollow piston-rod above the ball carries two metal hemispheres, the upper one being fixed and the lower one loose to press into the ball and make it of a cup shape. There is a small hole into the hollow piston-rod between the two hemispheres, and when the rod is raised, water flows through the hole in the ball and fills it. When the rod is depressed, the hole is closed and the water flows out of the ball through the lower guide tube. Feb. 24, 1881. Price 6d.

822. B. C. Cross, Dewsbury. Socket-pipes for sewers and drains.

To keep the lower edge of the pipes for sewers and drains in one and the same straight line when laid, the under side of the pipe is equal in thickness to the combined thicknesses of the other side and the socket. Feb. 28. 1881. Price 4d.

861. W. Morgan-Brown, London. Devices for hanging doors and blinds.

To allow sliding doors which are hung on pivoted levers to remain in the position in which they are placed, without a tendency to return to the position in which the levers are in equilibrium, the truss-formed levers are attached together centrally, and one is connected to the door-post and attached to a guide on the door, while the other is connected to the door and guided on the post. A kind of parallel-motion device is also applied to guide the latter lever in its movement. (Com. by E. Prescott, Rockingham, U.S.A.) March 1, 1881. Price 6d.

875. H. Faija, Westminster. Treatment of concrete and cement for building, &c.

After the concrete or cement is mixed or gauged in the required form, to enable it to be speedily used, it is placed in a chamber into which steam is admitted. It is then subjected to the action of a warm bath of sea-water, or a warm silicate of soda or potash bath. In order to accelerate the induration, concrete or cement may be mixed with alkali or silica or salt in solution. March 1, 1881. Price 4d.

906. G. L. Sutherland, Manchester. Stoves and fireplaces.

The sides and back of the stove have air-warming chambers, which are provided with horizontal partitions, to cause the air to take a circuitous course when flowing through. The two side-chambers are divided into compartments, and these compartments and the back chamber are connected together by arched pipes, round which the heated gases from the fire flow. These gases are caused to flow through a chamber containing water, to deposit the soot therein. March 3, 1881. Price 6d.

912. R. Adam, Southwark. Window-sashes fan-lights, &c.

To make vertically-sliding windows revolve on centres to facilitate cleaning and repairing, the beads between which the sashes slide are movable, and the sashes are hung on pivots which bear in supports which slide between the beads. March 3, 1881. Price 6d.

926. G. Maw and A. Maw, Broseley. Decorating bricks, tiles, pottery, &c.

A mould is made by casting in plaster, metal, &c., of the decoration to be used, and with this mould is pressed the surface of the article either with plastic clay or by the dry or dust process (Prosser's system). The article is then fired and decorated by coloured glazes or enamel. "Mosaic tiles" are produced by moulds, into the depressions of which clays of various colours in the dust state are introduced, backed up with the necessary thickness of dust and submitted to pressure, which consolidates the separate tesserm with the backing, and forms the tile, which is then fired. March 4, 1881. Price 2d.

928. E. E. Lucas, London. Ball-valves.

This valve consists of a circular recessed chamber with a seat at the bottom, in which is a mushroom-valve. The ball lever is jointed at the bottom of the valve and the end turned over so as to resemble a cam. As the water in the cistern is lowered this cam raises the valve. (*Prov. Pro.*) March 4, 1881. Price 2d.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

THE BEER MAUSOLEUM.

With reference to the correspondence in our issue of October 8th,* we have received another letter from M. Bouwens, of Paris, in which he objects to Mr. J. O. Scott's assertion that the monument is a joint work, and desires to submit the question to a jury of distinguished artists. We must, however, decline interfering farther in the matter.

Ladies' Sanitary Association.—A second series of nine lectures on "Domestic Sanitation" will be delivered by Dr. Richardson, F.R.S., in the lower hall, Exeter Hall, Strand, during October, November, and December. In this course of lectures the structure and functions of the nervous system of man will be presented. The physical and mental training of the young will be considered in this division. The lectures will be illustrated by the oxy-hydrogen lantern. The first lecture will be delivered on Saturday, October 22nd, at five p.m., and will be continued on the following Saturdays until December 17th. Six prizes will be awarded to the most proficient students.

* See p. 466, *ante*.

DALWOOD CHURCH.

The parish church, a building of the fifteenth century, consisting of west tower, nave, north aisle, chancel, and north chantry chapel, has just been reopened. The gallery under the tower has been removed and the tower arch opened out. The north arcade wall of the nave has been rebuilt, and all the old stones re-used; new roofs covered with Portmadoc slates (the ridges of red tiles) have been put to the nave and chancel, with deal wagon-headed ceilings, the chancel ceiling being the richest. Moulded ribs divide them into panels, with carved oak bosses at intersections of the ribs. A few of the old bosses have been re-used in the nave. The north aisle, roof, and ceiling have been repaired. The modern pews have been abolished, and the body of the church fitted with stained deal open benches. It will now accommodate 200 persons. To the chancel English oak stalls have been put. The Jacobean oak pulpit has been cleaned of paint and re-set on a new base of Ham Hill stone. The new altar-rail is of oak, in wrought-iron metal standards. The chancel pavement is of Godwin's encaustic tiles, specially made for the architect. The chancel arch, which had been cut away, has now been replaced by a new arch of Beer stone (the material employed in the old part of the church). The walls have been re-plastered and cleaned, and all the doors and windows repaired. The glazing is of cathedral rolled glass in various tints, and clear white glass in ornamental lead quarries. To heat the building Porritt's Underground Stove has been employed. About 1,000*l.* have been expended on the works described, which have been carried out in two contracts, by Messrs. Hutchings & Berry, and by Mr. Berry, of Honiton. The plans were originally prepared by the late Mr. Ferrey, F.S.A., and Mr. B. Edmund Ferrey, the work having been superintended by the latter.

STAINED GLASS IN GERMANY.

The *Gartenlaube* has given prominence to the belief that English stained glass has acquired its present position by the following as nearly as possible of the technicalities of the art as practised by its original founders, thus producing the full colour and peculiar general effect of Mediæval work. The attention of the artistic world has, during the last few years, been given, in a somewhat important degree, to the question of stained glass generally, much information having been brought to light by the researches connected with the celebration, in 1879, at Tegernsee in Bavaria, of the nine-hundredth anniversary of the stained-glass factory at that place, the establishment of which is attributed to Count Arnold of Vohburg, and Gonzbert, Abbot of Tegernsee. From this spot the knowledge of the art is said to have diffused itself throughout Europe, and having penetrated into the regions of domestic architecture, its decadence was caused by a combination of influences reflecting the prejudices of centuries less alive to the beauty of the art than our own age, which has witnessed its revival.

The modern art of staining glass is founded, it is remarked, on its re-discovery at the commencement of the present century. An Englishman who was bargaining for some pieces of old stained glass at a glazier's in Nuremberg, happened to meet there a cabinet varnisher named Siegmund Frank, to whom he casually remarked that any one who could revive the once prosperous art of staining glass could make a fortune out of it. Frank took up the suggestion, and produced a heraldic representation as the first sample of this new development of the art. The Government took up the matter later on, and a suitable place for operations was granted to Frank. In 1845 an institution was opened at Munich, under the direction of Herr Ainmüller, who had been associated with Frank in the earlier period of this revival. The English efforts in this direction have been less an imitation of what has been done in Germany than a close following of the Mediæval work which has come down to the present day. The preference shown for it is exemplified by the fact that English stained glass has gained a footing in such a stronghold of German art as Munich. Considering that Bavaria witnessed the original starting of the stained-glass industry, as well as the re-discovery to which allusion has been made, it is evident that the production of English artists must be of a high order of merit to compete so fully in that country with German work.

A peculiarity of stained-glass manufacture, which forms one of the principal difficulties, is in its connexion with the effect of colours upon each other, and the apparent contraction of the size of objects represented when certain combinations are employed. On this subject some details of interest are given, from which it appears that blue exercises a marked influence upon the surrounding colours, making red appear violet, and white seem of a bluish tint. Dark objects on a light ground are less striking than light ones on a dark ground; and in accordance with this principle, an inscription in black upon white is legible at a distance of 11 yards, while a white inscription upon black can be read at a distance of 16 yards. On the same plan it is stated that a black figure on a yellow ground requires to be one-tenth larger than the same figure in yellow upon a black ground for both to appear the same size. Considerations of a similar nature have obliged artists in stained glass to adopt, in certain cases, proportions for objects in their representations, which although not true to nature, are necessary for producing that harmony of general effect at a short distance which is the most important requirement in artistic work of the class referred to.

THE "VICTORY OVER SEWER-GAS."

Sir,—I take it for granted that all who are intelligently interested in sanitary matters are agreed:—

1. As to the necessity of cutting off all direct connexions with the main drainage system by means of a good trap between the house and main sewer.

2. Of trapping all wastes, and delivering them over trapped gulleys in the open air.

3. That the Old system or No system of merely trapping the house-drain and carrying the soil-pipe up to the roof is (theoretically, at least) extinct, and needs no further consideration. Here I would state, as a mark of respect to those who have been for years endeavouring to improve our sanitary system, that each of the new plans, or modifications of the same plan, which I am about to criticise, is immeasurably superior to the old plan to which I have referred.* . . . . . .

It has been apparent to me for years that all or nearly all of the efforts that were being made, were in the wrong direction, viz.,—by ventilating up the soil-pipes. (It is both amusing and confusing to read the different opinions expressed at the Conference on May 3rd and 4th, 1877, as to whether the current in a soil-pipe is up or down, some contending that it is always up, others that it is always down. I think Mr. Ernest Turner was nearest the mark when he said that it was sometimes up and sometimes down; and I see that at the same time Gen. Cotton advocated ventilating down soil-pipe and up a separate shaft.) Also, by the retention of traps under the closet. Believing, as I do, that traps of all kinds are at best but necessary (if necessary) evils, I wanted some plan by which I could dispense with all I possibly could of them. I know that on the question of traps doctors differ, but I am content to adopt the description of Professor Corfield in page 108, "Laws of Health," pub. 1880, where he says, "Water-traps are not to be relied on; they moreover form receptacles in which solid matters lodge, and they always necessarily contain foul water; decomposition goes on in them continually, and foul gases are produced, so that they become, in fact, manufactories of foul air." Again, on page 20 of "Report of Conference," May 4th, 1877, Mr. Rogers Field dwelt upon the fact that sewage-gas passed through the water in ordinary traps imperceptibly, being absorbed on one side of the trapping water and given off on the other, as he had proved to be the case both at Uppingham and elsewhere. On page 65 of the same report he says, "D-traps are small cesspools."

I found by actual experiments again and again with the first and second systems, that although sometimes (when the atmosphere was clear, and a fair amount of wind blowing, especially if it were blowing against the front of the house, against the inlet) we got a very good up-current, even then the current was always checked, and generally reversed whenever the w.c.'s were used, and the better the flush of water, the more complete was the reversal of the current. It was more marked with the open pipe than with the valve inlet. This set me thinking, and I soon saw that there were three forces at work. The air-current, whether induced by cowl or open pipe (query) tending upwards, but always checked by the sewer gas generated in the soil-pipe, which, being heavier, was trying to go down. The fortunes of the struggle varied according to the conditions of the atmosphere; but directly the sewer-gas was reinforced by sewage and water from the w.c.'s, also wanting to go down, the result was an ignoble defeat for fresh air, which found itself driven out at a great rate, by the very way which it was supposed to use only as an entrance. I then set to work to try and yoke these three forces together into one team, by erecting an upcast ventilator of 3 in. wrought-iron barrel (that being the size of my inlet), carrying it up as high as possible, in order to utilise the wind-pressure. This arrangement of itself I found to answer very well, and consider it better than either of the other systems referred to, simply because fresh air and sewer-gas were both being helped along the right road by the greater power of sewage and water from the w.c.'s, and the oftener the w.c.'s were used the more fresh air was drawn down the soil-pipe and through the house-drains, and as there was no force acting against it the current was never reversed. This I found so good, that where poverty makes the cost of heating an objection, or where, in small houses, several parties occupy the same premises, or where there is no gas laid on, I should recommend the adoption of this plan, combined with good valve-closets, with ventilated P-traps, and good syphon or vacuum water-waste preventers, to ensure a good flush of water at each use of w.c.

This measure of success pleased but did not satisfy me, as I wanted not simply a good thing, but the best possible of attainment by me.

In August, 1880, when on a visit to the north, I saw enough of colliery-ventilation to feel convinced I could apply the same principle to aid me in the solution of the drainage problem. It was not till January of the present year that I saw clearly how I could apply it. I set to work and prepared some plans, and in February got my heating-chamber made and fixed to Sir Henry Cole's first house, and the results from the first surprised me. We used a great deal more gas than was necessary, and obtained results far in excess of our requirements. Not only so, but the results were so surprising that the heat alone would not account for them. On further consideration, I account for it by the fact that heat being generated by the consumption of gas within our up-cast, consumes such an amount of oxygen (Professor Corfield states that one gas-burner consumes as much as five men, or more, on page 31, "Laws of Health," 1880; and the *Daily Telegraph* of October 10th, 1881, states in an article on "Stage Lighting," that one gas-burner consumes as much as several men) for its own requirements, which, with its proportion of nitrogen, it has first to draw down the soil-pipe, and through the house-drains as fresh air, thus causing a tremendous current. The heat being generated in this way also provides a ready means for destroying any germs of disease in the sewer-gas, by passing it through the flames in the heating-chamber (it is thus invaluable for application to hospitals, barracks, schools, or large establishments of any kind), and out at the top up-cast above the levels of house-tops, in a state of greater purity than is attainable by any other means. I am now trying the value or reverse of cowls on top of up-cast, and, if I find their use advantageous, shall certainly use them, as I believe we are in duty bound to use all the forces at our disposal.

A word or two in reply to objections. First, to the "supposers." You may suppose anything with respect either to gas, wind, or water. Suppose it is calm, and you get no wind, or a gale, and your cowls are blown away; or suppose there is a very dry season and you get no water, or a very cold season and it is all frozen; or suppose the coal-mines are exhausted, and we can get no more gas, or that we have the gas, but it will not burn through corrosion of the burners or stoppage in the pipes. Well, in all such cases,

* We are obliged to omit our correspondent's criticisms of other plans; they would bring upon us an amount of correspondence to which we could not give space. The subject is a very important one, but some of our readers think they have already had enough of it.

unless you see that your machinery is put in working order again, and kept so, you will fail to produce the desired result. But I contend that, even without any heating-power being applied, the mode I adopt of always ventilating down the soil-pipe and up an upcast between the front of the house and the main drain, with both inlet and outlet above the level of all the windows, and actuated jointly by the water and sewage from the w.c. and the mobility of the atmosphere, is better than any plan that has come under my notice (although in that case I would retain ventilated P-traps, as before stated).

Secondly, as to the cost. It may or may not be enormous. I have tried it for weeks together without applying any heat, and have found it work well. I have used about 1 ft. of gas per hour (costing about 6d. weekly), and found it better. I am now using about 2 ft. per hour, and find it best; the results are so good that I am practically content. I have not attempted to find out the cheapest way to fit up a house with regard to sanitary matters, but the best,—and I at least prove my faith by my works, as I am applying it to all my new houses,—while the extra cost of valve-closets, disconnecting-shaft, and upcast ventilator will be 20*l.* or 25*l.* As, however, there are lots of shoddy merchants already in the market, whose aim is cheapness, I have no intention to endeavour to compete with them. G. E. Mineard.

POLITICS AND TRADE UNIONS.

Sir,—I entirely dissent from the writer of the letter headed "Politics and the Trade-Unions Congress." * If the trade unions would but look after the vote protected by the ballot, and get the knowledge how to use it, they would do more good than by trusting to the system of striking to get wages up. There is a great deal of fallacy about their getting wages higher. It is true, in some instances, mechanics and labourers get a larger amount of wage in the building trade; but it is neutralised by the advance in house-rent, butcher's meat, shoes, clothing, &c. And that is not all; there is a more rapid way adopted of doing work, and machinery is displacing many *employés* in the building trade; but more of that anon. My object in putting pen to paper is to show an "Old Hand" that the great fault of the working class is that they are not political enough. Why, the coloured people of the United States are better posted up in what concerns the welfare of the country than what many of the English working class are here. I have passed two years in Kansas, in the far West, and I should recommend an "Old Hand" to take a trip to America, and then he would see that there are plenty that are in their "teens that go early to the loom, the forge, and the plough," become Presidents of the United States, like Lincoln and Garfield, or become eminent, like Elihu Burritt, the learned blacksmith; and, more than that, he will see no dilapidated husbandry there. (See the current numbers of the *Daily News*.) We are living in a transitional age. The increase of population and the spread of education are opening the people's eyes, but we are bound and tied by our great-grandfathers' notions.

It is because we are content to let others think for us, that we are divided into Liberals and Conservatives. That nonsense is all played out, and it is time we took a new departure; and if we are hewers of wood and drawers of water, are we to be content while we have plenty of wood to hew and water to draw? No, no, Mr. Old Hand; such counsels are dangerous both to employers and employed. Politics is as necessary to the life of the nation as the air we breathe or the water we drink. It is toleration we want; civil and religious liberty. It is because the English mechanic is not political enough that he is led into the disastrous strikes of late years. Because a few well-meaning men meet together (and I give them credit for good intentions) they forget the surplus outside, and how it is created, and think they can carry all before them. I know what it is. I have had some years' experience, and hope to have more yet. I am no strike-jobber; and let me give a word of advice to the men in the building trades, first to move all places of meeting as far as possible from the public-house, and to remember that a grave responsibility rests on those that wield the striking instrument: too often, like a boomerang, it recoils on the heads of those that use it, as well as on the innocent and inoffensive. At the same time, it is at best a wretched palliative. Like a civil war, it breaks up the happiness of many a home, and after a few years you find yourself in the same position as when you started. W. A. S., Plasterer.

* See p. 433, *ante*.

GUIDES IN THE BRITISH MUSEUM.

Sir,—Your interesting and instructive articles upon the Egyptian exhibits at the British Museum have been the means of recalling to my mind the still-existing necessity of something in the way of a lucid and comprehensive explanation of our art and archæologic treasures.

Of what use is it to boast of the value and rarity of our collections, if we do not seek to instruct the people so that they may understand and so appreciate them? The majority of the visitors to the British Museum wander about aimlessly, attracted by this and that, with no settled purpose, and in the end understanding nothing. Many a scoff I have heard passed upon a collection of old nails or bronze vessels; while another class simulate admiration for anything and everything they see: the fact of the object being old is to them a sufficient reason for its being so carefully guarded. Each are equally ignorant, and yet the amusement derived from such ignorance by those who do know comes as badly as the foolish observations themselves; for there is actually little or no opportunity for the visitors to gain the information they would gladly avail themselves of if it were procurable. For that the masses do wish to understand is not to be denied, and is proved by the rapidity with which a crowd of interested listeners will congregate around any one who may be explaining or commenting upon the exhibits, and their murmurs of discontent, when dispersed by the officials, in obedience to the rules of the institution, which forbid explanations to be given or crowds to collect.

We shall probably find from the statistics that the number of visitors will have considerably fallen off now the natural history collection has been removed to South Kensington; for it was chiefly in these galleries that the majority seemed to find most enjoyment. Nor is this at all surprising or the reason far to seek. Was it not because they could see there that which they could to a certain extent understand?

What is wanted, and wanted sadly, is a short guide to each room explaining the exhibits and their influence upon art and civilisation, published at a price within the reach of all,—something after the manner of the guides published by the Crystal Palace Company to their various courts,—and if such a series were produced by some competent men under the supervision of Government, it would not only enhance the value of our rare possessions, but lay the foundation of a sound artistic knowledge for the art-student as well as instructing the many of the passing curious. W. C. Haite.

*** We have printed this note as a reason for mentioning what ought to be fully known, but certainly is not, that there are guide-books to all the various rooms obtainable for a few pence; and these will be altered to suit the new arrangement of rooms in due course.

PROTECTION AGAINST FIRE.

Sir,—Your paragraph in last week's *Builder* concerning the destruction of an ancient house at Bristol, where the loss is estimated in money value at 25,000*l.*, but with your significant addition of the few words, "but in truth no amount of money will represent it," owing to the destruction of the world-renowned premises themselves, together with a very valuable stock of books and MSS., calls for a reminder that cannot be made too widely known. It is simply this,—There are many fire-offices standing A 1 that make an allowance on the insurance premium of 10 to 15 per cent., provided the premises are fitted with suitable fire-extinguishing appliances. I may mention that my insurance rates amount to 280*l.* per annum. I keep a fire-engine on the works, and have hydrants connected to the water companies' main. I have also a few hand-pumps of the London Brigade pattern, and three or four dozen buckets *always full of water*. The value of my fire plant is about 400*l.*, and for this outlay I have an allowance from my premium of 15 per cent., or 42*l.* per year. Surely this is an excellent investment, and mine is only a business of a moderate size. A Manufacturer.

Architectural Education at University College.—Pressure of matter compels us to postpone the remainder of Professor Roger Smith's lecture, the first half of which we published last week.

COMPETITIONS.

Fever Hospital, Bolton.—The Sanitary Committee of the Bolton Corporation have selected the plans for the new hospital for infectious diseases, to be erected in Hulton Causeway, Rumworth. The competition was restricted to local architects, and of the eleven sets of designs sent in, the first premium of 25*l.* has been awarded to Mr. Marshall Robinson, of Acresfield, who sent in plans bearing the motto "Desideratum," while the second premium of 15*l.* was awarded to Mr. Thomas Heselden, of Bowker's-row, whose plans were distinguished by the device of the borough arms.

Proposed Baths and Wash-houses for the Parish of Battersea.—We understand that the six sets of designs sent in competition for this building in the month of May last have been submitted to Mr. J. Ebenezer Saunders, architect, who will advise the Commissioners as to their relative merits.

KEEPING DOWN THE WATER.

Sir,—With reference to your correspondent's letter, signed "Greenhorn," in your issue of the 8th inst., I give the following information, which may assist him out of his dilemma:—

Many years ago I had occasion to form an underground tank, 20 ft. by 12 ft., by 9 ft. deep, for the reception of rain-water, and in making the excavation the contractor struck a vein of sand, about the level of the bottom of the tank, from which water rose, and stopped proceedings. I directed a hole to be sunk in the centre, and 2 ft. lower than the bottom of the tank, in which a pump was placed, and by keeping the water down by pumping, the walls were carried up, and the floor of the tank, which was formed of two courses of bricks on flat, in cement, formed, except where the pump stood which, could not be completed owing to the head of water rising in the hole. After thinking over the matter, I had a small well sunk *outside* the tank, 2 ft. deeper than the hole *inside*, and as we struck the same vein of sand and water we placed the pump in it, and by keeping the water down for twenty-four hours, by relays at the pump, we made good the hole *inside* the tank, and gave the cement time to set.

If the subsoil in your correspondent's case is not porous, I would recommend the formation of a small trench drain between the pump-hole inside and the temporary well outside.

Wm. J. Walsh, Surveyor,
Royal Engineer Department.

CHURCH HEATING *VERSUS* CHURCH VENTILATION.

Sir,—For the sake of the attenders this subject might be ventilated a little, because, as it seems to me, the heat is often got up at the expense of the ventilation, and so the comfort (and sometimes even the health) of the sitters and officials is impaired.

To obviate this, the following plan might be useful, viz., heat up the church the necessary time before the services are to begin, so that the walls and seats, &c., may be warm, keeping the ventilators shut altogether or nearly so. Then so many minutes as necessary before the congregation assemble, open all the outlet ventilators, and also the inlet ones and the doors, for a short time, so as to send out the warm confined air quickly by letting in fresh air. The air coming in so will not have time to cool the walls and furniture, and so, although the fresh air may be cool, heat being radiated from the walls, &c., the sitters will feel comfortable, as the doors will be shut before they enter. The remembrance of some disagreeable experiences last winter induces me at the beginning of this to make the foregoing remarks.

W. P. B.

STEAM-PROOF CEMENT.

Sir,—Will any of your readers kindly tell me, through the medium of your paper, which is the best cement to use (and if something should be mixed with it) for jointing flags used for making a floor to dry bricks on? The cement I have used allows the steam to work its way through, and so, instead of being perfectly dry, as the flags are, it is wet, and spoils the bricks which happen to lie on the joints. B. H.

The Steamship "Great Eastern" was put up for sale in London on Wednesday, the highest offer made being 30,000*l.* Of course the vessel was not sold at this price.

THE FISH-MARKET QUESTION.

Sir,—Referring to the remarks in your impression of the 8th inst., on my proposal for establishing a fish-market at Bankside, kindly allow me to state that in the report of Sir J. Bazalgette (engineer), and Mr. G. Vulliamy (Superintending Architect to the Metropolitan Board of Works), which has been partly published by the daily papers, these gentlemen state that their instructions appeared to limit their selection of sites to the neighbourhood of the principal railway termini north of the Thames, and after suggesting that the Board should place no restrictions which would interfere with their recommendations, they propose a site on the south side of Blackfriars Bridge, which, as they state, possesses advantages superior to any other that has been proposed.

It is situated between Southwark street, York-street, and Bear lane, with frontage on Blackfriars-road; and is proposed as a market for railway-borne fish. At the same time they suggest that should it hereafter be considered desirable to unite the water-borne fish-market with it, the same could be easily done by forming a wharf on the banks of the river, and so running the fish in trucks to the market.

Sir H. Walpole states that a riverside is a *sine quâ non* for a fish-market, and I maintain that it is most desirable to have one market for the sale of both rail and water borne fish, and it is absolutely essential that it should be by the riverside; therefore, you will readily see the site I propose,—situated between Blackfriars and Southwark bridges, possessing river accommodation which even eclipses that offered by Billingsgate Market, having direct communication with the principal railways which bring fish to London, and comprising very inexpensive property, with facilities for further extension if required,—is far preferable to the site in Blackfriars-road, which site it would very shortly be found absolutely necessary to connect with the river, and which would, to a great extent, interfere with the tramway and ordinary traffic of Blackfriars-road, which is ever increasing; respectable people would be upset, and the site would be far more expensive than that proposed by me at Bankside, which comprises property in a most wretched and dilapidated condition, and which, of course, could be acquired very cheaply. It is exactly opposite St. Paul's Cathedral, on the other side of the river, and the establishment of a fish-market there would certainly be an improvement to the metropolis.

H. J. Leeuw.

EXPERIMENTS ON TRAPS.

Sir,—I trust the importance necessarily attached to all sanitary matters will be a sufficient excuse for my requesting the favour of an insertion of this letter in your paper. Your readers are aware that with a view to making as many improvements as possible in the sanitary arrangements of buildings, there has lately been delivered a series of lectures at the Society of Arts' Rooms. These lectures referred in particular to that which is known in the trade as "trapping"; and if they have had no other good effect, they have at least aroused energies in the trade that will undoubtedly result in enabling architects, sanitary engineers, builders, plumbers, &c., to decide which is the really best system of closet-trap to adopt, with a view to effectually excluding the poisonous gases from the houses. The first result of this agitation is, that a series of experiments has been tried with closet-traps made to the full size. Within the last two months a scaffold has been erected some 60 ft. high, having attached to it a length of soil-pipe 45 ft. high. To this has been connected six branches for fitting any sized trap desired, and each is fitted with closet-basins. This arrangement has enabled the experimentalists to discover the true action of the ℘, "Eclipse," and ℧ traps.

The action of the ℘ trap is that on lifting the plug at the bottom of the basin (which had been previously filled with water), the water in the basin, as also that in the trap, rushed forward and left the trap unsealed, consequently leaving passage for any sewer gas that might be generated. This action is commonly called siphonage, but is in reality the momentum of the water itself, which, owing to the slope of the trap, though it clears everything before it, at the same time leaves the trap without water, at once proving that the ℘ trap is not a trap at all.

The action of the "Eclipse" trap is the same as that of the ℘.

The ℧ trap, made according to the new method, was also tested, and proved (as I always contended it would) to answer every requirement, *i.e.*, it is perfectly self-cleansing, it does not sbb out, nor does the force of the water, however great, destroy the water seal.

Architects, engineers, and responsible members of the building trade may see the various traps in operation and test them for themselves by applying to Mr. J. Pullen, 73, Penton-place, Kennington Park-road, S.E.

P. J. Davies, A.S.P.

CHURCH-BUILDING NEWS.

Sancreed.—The parish church of Sancreed, Cornwall, which has been restored under the superintendence of Mr. J. D. Sedding, architect, at a cost of 2,150*l.*, was re-opened on the 3rd ult. The restoration fund at present amounts to about 1,750*l.* Before the works were commenced, the church was a pitiable sight, with its defective roofs and walls, and wooden windows.

Stapenhill.—The new Church of St. Peter, at Stapenhill, near Burton-on-Trent, has been consecrated. It occupies the site of an older and smaller building. The new church, which is Late Decorated in style, consists of north and south aisles, 60 ft. long by 17 ft. wide; nave, 60 ft. long by 32 ft. wide; chancel, 30 ft. long by 32 ft. wide; and north and south transepts, 24 ft. long by 21 ft. wide. The aisles and nave have separate roofs, the nave being lighted by means of clearstory windows,—eight double lights on the south side and ten on the north. The light for the aisles is obtained by means of three-light windows,—three on the south side and five on the north. The transepts have each handsome traceried double windows, and a corresponding window is also seen at the west end of the church, while a larger one, of exquisite design, provides light for the chancel at the east end. The whole of the windows are filled in with plain cathedral glass. At the west end of the church is the choir gallery, with circular balustrade front, and the old organ has been re-cased, and placed therein. The aisles are divided from the nave by five bays on either side, supported by Bath stone columns. From these bays the roofs spring, and further support is given to the nave roof by the introduction of gilded steps thrown across. Internally, the nave roof is of varnished Memel deal, but the whole of the other woodwork is of varnished pitch-pine. The aisle floors are paved with ordinary quarries, while the chancel is laid with Minton tiles, and wooden blocks are used in the seats. Each seat is furnished with a rug and hassock. These have been supplied by Messrs. Jones & Willis, of Birmingham. The ventilation of the church is stated to be on a new principle, and has been provided for by Messrs. Foster & Pearson, of Beeston. The internal walls are of brick coated with plaster, with Bath stone dressings. Externally the walls are of Derbyshire stone, with dressings of Bath and Ancaster stone, and the upper part of the tower will also be of the latter material. The tower will reach about 100 ft. in height, or 55 ft. above the windows. A pinnacle, 21 ft. above the coping of the battlement, will surmount the tower at each corner, and smaller pinnacles will be placed at the summit of each side. The church, which will be warmed by hot water in pipes fixed along the walls and floors, contains sittings for about 900 persons, many of which will be free. Messrs. Lowe & Sons had the building contract, while the executors of the late Mr. H. Mason have done the woodwork; Messrs. Pickering Bros. the plumbing, glazing, &c.; Mr. Rhodes (Nottingham) supplied the gasfittings; and Mr. Humphreys (Nottingham) fixed the hot-water apparatus. Mr. Corser acted as clerk of works at first, and he was succeeded by Mr. Dent. The work has been carried out under the superintendence of the architects, Messrs. Evans & Kelly, of Nottingham. The total cost is about 10,500*l.*

Lower Tranmere.—The new church of St. Luke, Lower Tranmere, was consecrated on the 18th inst. by Bishop Kelly, late of Newfoundland, acting for the Bishop of Chester. The building was commenced last year, and takes the place of a temporary church erected in 1874. It consists of nave and chancel (the same height), and side aisles, with somewhat lofty clearstory. It is designed in the late Gothic or Perpendicular style, simply treated. Advantage has been taken of the great fall of the land by placing the vestries underneath the east end, the choir vestry being large enough to seat over 100 persons. The church will accommodate 720 persons. There are four entrances, that at the south-west corner having a commodious porch. The organ is placed at the east end of the north aisle. At the west end of the nave is erected a substantial half-timbered bell-cote. The whole of the exterior is of local stone, and a portion of the interior is faced with Runcorn stone. The benches are of pitch pine, also the altar-rail and table, the pulpit and font being of stone. The builder's work has been carried out by Mr. A. Bleakley, of Birkenhead; the heating by hot-water by Messrs. Hinson; and the lighting by Mr. Hamilton, also of Birkenhead. The whole has been designed and carried out under the superintendence of Mr. G. E. Grayson, architect, Liverpool. The total cost of the building will be about 5,500*l.*

Miscellanea.

Manchester Architectural Association.—The annual *conversazione* of this Association was held on Wednesday evening in the Memorial Hall, Albert-square. The society at present numbers about seventy members. The proceedings included an address by the president, Mr. J. Murgatroyd, and an exhibition of models, drawings, sketches, and other works of art contributed by members and friends of the Association.

New Schools are about to be erected in the Bearwood-road, Smethwick, from the designs of Messrs. J. F. Sharp & Co., Birmingham, architects to the Harborne School Board.

The Turners' Company.—This company have again awarded prizes for works submitted. In wood there were twenty-six exhibits, including vases, candlesticks, inkstands, columns, oval frames, plates, waiters, table legs and columns, cigar-holders, paper-racks, ring-stands, and other articles. The judges (Mr. A. P. Bower, Mr. S. Jacques, Mr. J. Jones, and Mr. Winser) certified improvement in these examples over those shown at former exhibitions. They awarded the first prize to Mr. J. S. Coulson, of Kirkgate, Thirsk, for four vases and card-dishes; the second prize to Mr. Nickolay, of 43, Rupert-street; and the third prize to Mr. J. M'Donald, of 4, Chapel-house-street, Millwall. The same judges also spoke in high praise of the work of the students in the Middle-class School in Cowper-street, Finsbury. They awarded the prize to W. V. Weldon. In the amateur class they gave the prize to Mr. H. Balsham, of Altrincham. In pottery, the judges were Mr. George Wallis, F.S.A., of South Kensington Museum; Mr. Horace Jones, the City Architect; Mr. C. T. Newton, C.B., of the British Museum; and Mr. J. J. Holtzapffel. The first prize was awarded to Mr. Alfred Dupuis, of 129, Princes-road, Lambeth, for some beautiful vases and pillars; the second to Mr. Thomas Ellis, of 69, Vauxhall-road; and the third to Mr. William Bolton, of 57, Dashwood-road, Battersea. In the metal classes the judges were Sir Henry Bessemer, F.R.S., Mr. C. Hutten-Gregory, C.M.G., Colonel Haywood (engineer to the Corporation), and Mr. R. Price Williams. The first award was made to Mr. A. E. Nelson, of 31, Halton-street, Canonbury, for some hard-flatting rolls. The second prize was given to Mr. H. A. Alexander, of 166, Camberwell-road, for a ball-and-socket joint; and the third to Mr. C. J. Barber, of 74, Cleveland-street, Fitzroy-square, for a Grecian vase. The Lord Mayor has since presented the prizes.

"Owen Jones" Prizes, 1881.—This competition was instituted in 1878 by the Council of the Society of Arts, as trustees of the sum of 400*l.*, presented to them by the Owen Jones Memorial Committee, being the balance of the subscriptions to that fund, upon trust to expend the interest thereof in prizes to "Students of the Schools of Art who, in annual competition, produce the best designs for household furniture, carpets, wall-papers and hangings, damask, chintzes, &c., regulated by the principles laid down by Owen Jones." The prizes are awarded on the results of the annual competition of the Science and Art Department. Six prizes were offered for competition in the present year, each prize consisting of a bound copy of Owen Jones's "Principles of Design," and a Bronze Medal. The following is a list of the successful candidates:—

1. Gideon Fidler, School of Art, Salisbury.—Design for carpet.
2. John Lamb, School of Art, Kidderminster.—Design for carpet.
3. Thomas Dutton, School of Art, Nottingham.—Design for lace.
4. Rose Phillips, School of Art, Northampton.—Design for wall paper.
5. Robert Harris, School of Art, Salisbury.—Design for chintz.
6. W. J. Clulow, School of Art, Macclesfield.

Dealing with Dangerous Structures.—At the meeting of the Metropolitan Board of Works, last week, the Finance Committee presented a report, stating that it appears desirable that further Parliamentary power should be obtained by the Board in connexion with the recovery of the expenses of dangerous structures, and recommending that the subject be referred to a committee for consideration, with a view to obtain an amendment of the law by a clause in a Various Powers Bill, or as soon as a fitting opportunity presents itself. This recommendation was agreed to.

The Gale of Friday, the 14th inst.—The daily papers have informed readers of the very great damage done all over the country by the storm of Friday in last week. Many lives were lost, and several marvellous escapes are recorded. Buildings were unroofed and strong walls blown down. These facts ought to receive the careful attention of all who are engaged in construction. In connexion with this subject, we note that a communication has been addressed to the principal fire-offices suggesting the expediency of establishing a distinct branch of business for insuring houses against damage by wind.

New Dock at Swansea.—Their Royal Highnesses the Prince and Princess of Wales were present on Tuesday at the opening of a new dock at Swansea. The dock, which has been constructed at a cost of nearly 200,000*l.*, was christened the Prince of Wales Dock.

The Wind and the Thames.—*Apropos* of the storm of Friday, the 14th of October of this present year, when for several hours the waters of the Thames were so low that the bed of the river was in many places exposed, and the stream so far withdrawn from the bank on either side that an opportunity was afforded for picking up several curiosities, several of considerable interest and value, it may be interesting to give the following extracts not made use of in any history of Old London:—"March 2nd, 1761.—The flow of the tide was so little that the starlings [the wooden piles driven in outside the foundations of the piers] were not covered at high water,—a thing not known in the memory of man." "July 4th, 1768.—The water of the river Thames was so much driven [by the wind] out of its usual channel above bridge, as is not remembered by the oldest man living; one-half of the bed of the river remaining uncovered with water during two tides." "August 11th, 1772.—The water of the Thames was so remarkably low in the afternoon, that people might have waded across from Pepper-alley-stairs to the opposite side without danger of drowning." A storm of wind was raging at the time. Pepper-alley-stairs will now be sought for in vain. They were above bridge, near Paul's Chain, facing Pepper-alley, on the Borough side.

The Board Room in Spring Gardens.—At the meeting of the Metropolitan Board of Works on the 14th inst., it was resolved, on the motion of Mr. Selway, to refer the question of the warming and ventilation of the Board-room to the Building Act Committee. There is good reason for such a reference, the room, although a large one, being generally very close and "stuffy." If any structural or internal alterations are made in the apartment, the esteemed Superintending Architect of the Board will earn the gratitude of the reporters by bringing forward the front of their gallery by at least a foot. Any reporter who wishes to pass to or from a seat at the end of the gallery nearest from the door cannot do so without disturbing the whole of the fifteen or sixteen other occupants. The gallery is just wide enough for its long row of chairs, but the provision of adequate gangway-room behind the chairs seems to have been forgotten.

Leggott's Patent Window Lift and Fastener.—In this arrangement the window is wound up, or down, by simply turning a handle, which acts on a short endless screw, and in the model we have seen it certainly seems to act very satisfactorily. The apparatus provides an easy and inexpensive method (always at command and under ready control) for ventilating any apartment by the opening of a window, either at top or bottom, or both, by one operation. It affords at the same time security against thieves, as the sashes, whether closed or opened, are perfectly locked. It dispenses with all sash-cords, sash-weights, sash-fasteners, and the consequent annoyance and expense of repairs which always attend the antiquated system of window-hanging hitherto retained. We understand that two of the lifts have been made by order of Mr. John Whichcord, architect, for the new Houses of Parliament, Cape Town.

Alexandra Palace Industrial Exhibition.—The young men of Holloway and neighbourhood are well represented by the exhibits of F. J. Bancroft (a junior in the Highways Department of the Islington Vestry), who, under the head of "Studies in Building Construction," shows a collection of upwards of sixty specimens of woods, as used in carpenter's, joiner's, and cabinet-maker's work, as well as a very fair show of architectural drawings, and specimens of wrought-iron bars twisted and bent in various ways, to show the quality of the metal; also a collection of specimens of granite used in paving roads.

City and Guilds of London Institute.—This Institute for the Advancement of Technical Education has just now issued its Programme of Technological Examinations for 1881-82 (Gresham College, London). It gives a syllabus of subjects of examination, and includes copies of the papers set in the last examination for 1881.

Builders' Benevolent Institution.—An old friend of this important institution, desiring to aid its current funds, has offered to contribute one hundred guineas if twenty other gentlemen will give ten guineas each. A letter on the subject from Mr. Geo. Burt, the President, will be found in our advertising columns.

The Manchester Infirmary.—The Earl of Derby took the chair at a meeting held in the Manchester Town-hall, on Tuesday, in aid of the funds of the Manchester Infirmary, of which institution he is the President. He explained the financial position of the infirmary as follows. It had been found necessary since 1877 to make alterations and improvements in the hospital costing 23,000*l.*, while the hospitals at Cheadle and at Monsall had cost 11,000*l.* more. It was absolutely necessary to put up a building for the use of the nursing staff, and that would involve an additional outlay of 5,000*l.* It is calculated that the cost at which the infirmary could be maintained on its present footing was 27,000*l.* to 28,000*l.* yearly. Unluckily, Lord Derby said, in all cases, more especially in the case of hospitals, and above all in hospitals situated in large towns, nothing was more costly than effective sanitary work. The very first condition of sanitary improvement was fresh air and plenty of it, and fresh air in hospitals meant increased space, and increased space meant a larger outlay in building, and not only that, but a larger outlay to keep up the buildings.

Communication with Lighthouses and Lightships.—A meeting was held at the Mansion House on Tuesday, convened by the Lord Mayor on a requisition signed by 1,200 citizens, for the purpose of representing to her Majesty's Government the urgent necessity of establishing telegraphic communication between lighthouses and lightships and the shore, so as to prevent great loss of life round the coast in vessels shipwrecked or in distress. The Lord Mayor, who presided, observed that most of the vessels in distress and the wrecks happened to be at least ten or twelve miles distant from the mainland; that rockets and guns were now the only available means of communication; and that these entirely failed in fogs, snowstorms, and often atmospheric disturbances. He could hardly imagine any more desirable end to attain than the placing of the lighthouses and the surrounding lightships in instant communication with the shore, by which means a vast amount of property and great numbers of lives might be saved. The lighthouses were admirably managed by the Trinity House, and the lifeboats on shore were ever ready for duty, but lives were lost and goods sacrificed by the absence of communication, and the loss of time that now elapsed in observing the signals of distress. Resolutions urging the Government to carry into effect the desired communication were adopted.

Topographical Society of London.—We understand that Wyngaerde's large view of London, which has been lent on bond to the Society by the Trustees of the Bodleian Library, is now being copied by the Typographic Etching Company's photo-intaglio process. It is hoped sheets of a considerable portion of the view may be delivered to the members with but little further delay. The extracts from the calendars of State papers, &c., are being collected, as announced in the prospectus, and it is expected that the first report of the Society will contain several illustrations of houses of interest which have lately been pulled down.

Exhibition of Paintings on China, Birmingham.—The third annual exhibition of paintings on china was opened on Tuesday at Mr. R. W. Thrupp's Fine Art Gallery in New-street. The majority of the exhibitors are ladies. The exhibition is a thoroughly representative one, for whilst Birmingham figures well with 120 exhibitors out of 467, the others include works of artists from all parts of the country. In consequence of the increase on the number of exhibitors,—from 252 to 467,—it has been necessary to limit each to three exhibits.

Norwood.—A new Baptist chapel is being erected in Gipsy-road, Norwood. A contract has been entered into with Messrs. J. Smith & Sons, builders, of South Norwood, to build the new chapel at the cost of 3,936*l.*, from the designs of Mr. Hampden W. Pratt, of Furnival's-inn, who was the successful architect in the competition which took place in May of this year. The building is intended to seat between 700 and 800 persons.

The Church at Carlton-in-Cleveland, near Stokesby, was entirely destroyed by fire on Wednesday morning. The church was only rebuilt about three years ago, at a cost of 2,000*l.* The whole of the parish registers were consumed. It is supposed that the fire was the work of an incendiary.

TENDERS

For proposed new Parsonage House, at St. Peter's, London Docks, for the Rev. R. A. J. Suckling. Mr. Bowes A. Paice, architect. Quantities by Mr. C. Poland:—

For Foundations and pulling down old buildings.

Dawson	£1,490	0	0
Laing & Son	1,407	0	0
Higgs & Hill	1,140	0	0
Colls	1,075	0	0
Dove Bros.	990	0	0
Brown	945	0	0
Cooper	878	0	0
Manley	790	0	0
Palmer & Son	725	0	0

For Superstructure.

Dawson	£5,900	0	0
Colls	5,873	0	0
Laing & Son	5,229	0	0
Higgs & Hill	5,180	0	0
Dove Bros.	4,925	0	0
Brown	4,900	0	0
Palmer & Son	4,675	0	0
Cooper	4,644	0	0
Manley	4,447	0	0

For alterations and repairs to Nos. 14 and 15, Dorset-street, for Mr. W. T. Botting. Mr. Haynes, architect:—

J. Vear & Co. (accepted)	£395	0	0

For alterations in rear of premises, No. 122, High-street Borough, S.E., for Mr. T. D. Hill. Mr. T. W. Barry architect:—

Thos. Shuff	£489	0	0
Hearle & Sons	435	0	0
Jarvis & Sons	413	0	0
W. B. Downs	395	0	0
H. Bodien	377	0	0
*W. B. Downs	365	0	0
*Thos. Shuff (accepted)	350	0	0
*H. Bodein	327	0	0

* Revised estimates.

For alterations at the Grapes Public-house, Seven Dials, for Mr. W. Wright. Mr. T. W. Barry, architect:—

C. Everard	£980	0	0
W. Pringle	880	0	0
T. Shuff (accepted)	745	0	0

For alterations and additions to Mr. Harrod's Stores, Brompton-road. Mr. Alfred Williams, architect:—

Larter & Son	£1,189	0	0
Martin, Wells, & Co.	1,182	0	0
Langmead & Way	1,126	0	0
Benstead & Sons	994	0	0
Sprake & Foreman	989	0	0
Patman & Fotheringham	943	0	0
Stimpson & Co.	939	0	0

For erecting twelve houses in the Haringay-road, Green-lanes, N., for Mr. J. T. Pickburn. Mr. Smithers, architect:—

Harper	£4,906	0	0
Pawson	4,200	0	0
Henderson	4,200	0	0

For completing certain works at No. 61, Russell-square. Mr. Wm. Paice, architect:—

W. B. Downs & Co. (accepted).

For the erection of studio at Kensington. Mr. Wm. Paice, architect:—

Bodien (accepted).

For new roads and sewers for the London Land Company, on their Estate at Chingford Station, Essex:—

Philbey, Romford	£1,100	10	0
Dunmore, Horney	893	0	0
Bloomfield, Tottenham	890	0	0
Harris, Camberwell	793	0	0
McKenzie, City	782	0	0
Kebble, Regent's Park	765	0	0
Pizzey, Horsey	759	0	0
Killingback, Camden Town	755	0	0
Jackson, Leyton	714	0	0
Peill, Bromley	739	0	0
Wilson, Walthamstow (accepted)	697	0	0

For erecting new stables, &c., at Holly Park, Crouch Hill, for Mr. Marner. Mr. J. Hamilton, architect:—

Goodman	£280	0	0
Merton	257	0	0
Harper	254	0	0
Shurmur	243	0	0

For making new roads, kerbing, &c., at Wallington. Mr. J. Hill, surveyor:—

Hall (accepted)	£5,840	0	0

For alterations and additions to the National Schools Wolston. Mr. Herbert W. Chattaway, architect:—

G. Frith, Coventry	£170	0	0
J. Bushill, Wolston	169	0	0
J. Fitter, Wolston	140	0	0
J. Waywood, jun., Coventry	140	0	0
J. Worwood, Coventry	138	0	0
W. B. Heap, Dunchurch (accepted)	115	0	0

For proposed cottage residence, Hadley-road, New Barnet, for Mr. J. Woolley. Mr. Joseph White, architect:—

Gould & Brand	£587	0	0
Butcher	503	15	0
Pocock (accepted)	500	0	0
Noble (withdrawn).			

For filling in brick pits on the estate of the Right Hon. the Earl of Yarborough, New Clee, Great Grimsby. Messrs. Maughan & Cuxson, surveyors:—

Charles Simons (accepted).

For paving footways to new roads on the estate of the Earl of Yarborough, Great Grimsby. Messrs. Maughan & Cuxson, surveyors:—

James Brown (accepted).

For alterations, additions, and repairs to 54, Colebrooke-row, Islington, for Mr. Leopold Jacobs. Mr. W. P. Griffith, architect. Quantities not supplied:—

Bamford	£2547	10	0
Ebbage	535	0	0
Lidstone (accepted)	525	0	0

For additions to 32, Mildmay-park, Stoke Newington, for Mr. T. Rowlands. Mr. W. P. Griffith, architect:—

Fricker (accepted).

For the construction of new sewers in John-street, Little James-street, and St. John-street, within the Holborn District. Mr. Lewis H. Isaacs, surveyor:—

Wilkes & Co.	£1,794	0	0
Crockett	1,586	0	0
Marshall	1,577	0	0
John Mowlem & Co.	1,450	0	0
Ford & Everett	1,422	0	0
Neave & Son	1,394	0	0
Kilingback (accepted)	1,350	0	0

For alterations and additions to the Royal Oak, North Woolwich, for Mr. James Palmer. Mr. Edward Brown, architect:—

Hawkings	£510	0	0
R. Marr	494	0	0
S. Salt	395	0	0
S. & J. Brightmore	315	0	0

For alterations and additions at No. 143, Hoxton-street, for Mr. R. Hillier. Mr. Edward Brown, architect:—

R. Marr	£419	0	0
G. Skipper	369	0	0
S. Salt	360	0	0

For the erection of a pair of villa residences in Glengall-road, Woodford, for Messrs. C. Bolton & J. Channon. Mr. E. C. Allam, architect:—

North, Bros.	£1,450	0	0
H. Wells	1,379	0	0
A. Philbey (accepted)	1,320	0	0

For the erection of a villa residence on Norbiton Park Estate, New Malden, Surrey, for Mr. F. Sledge. Mr. T. L. Heward, architect. Quantities supplied:—

Geo. Worman	£819	0	0
Hy. Thorn	749	0	0
Jos. Saunders (accepted)	747	0	0

For bridge over Beverley Brook, on Blagdon Estate, New Malden, Surrey, for Messrs. Gusootte, Wadam, & Daw. Mr. T. L. Heward, architect:—

Pollard (accepted)	£187	0	0

For stable and coach-house, at Ripley Villa, New Malden, Surrey, for Mr. F. S. Merryweather. Mr. T. L. Heward, architect. Quantities supplied:—

John Earle	£120	0	0
Geo. Worman	117	0	0
Jos. Saunders (accepted)	91	0	0

For pulling down Old Red Lion, Hammersmith Mall, and erecting house and shop and four-roomed cottage on site, for Messrs. Fuller, Smith, & Turner. Mr. Wm. Nunn, architect:—

Hunt	£1,180	0	0
Lamble	1,165	0	0
Ilss	1,159	0	0
Wescombe	1,142	0	0
Mansell	1,130	0	0
Chamberlain	1,119	0	0
Nye	1,045	0	0

For repairs, &c., to Woodstock, Sutton. Mr. W. Newton Dunn, architect:—

Bowyer & Son, Norwood	£1,320	0	0
Phillips & Son, Baker-street	943	0	0
Peacock, Bros., Brixton	923	0	0
J. Smith & Son, Norwood	879	10	0
Kiddle & Sons, Norton Folgate, E.C.	850	10	0
Maxwell Bros., Brixton	849	0	0
Homann & Sons, Stanhope-street	845	0	0
Kerry, Highgate	817	19	4

For the completion of five residences at South Kensington. Mr. Thomas, architect:—

Oldrey	£6,488	0	0
Manley	5,412	0	0
Barter & Bickley	5,334	0	0
Toten & Sons	5,200	0	0
McManus (withdrawn).			

For roads and sewers at Wimbledon for the Land Development Association, Limited:—

William White, Dartford	£1,334	13	10
W. J. Botterill, Cannon-street	1,270	0	0
W. Stubbs, Lambeth	1,124	0	0
J. Poole, Wimbledon	1,100	0	0
M. W. Rowles, Acton	1,085	0	0
E. & W. Riles, Wimbledon	1,030	0	0
George Impey, Leytonstone	1,012	0	0
George Butler, Camberwell	1,000	0	0
Joseph Jackson, Upton	997	17	6
A. Oliver, Brighton	995	0	0
Wilkes & Co., Westbourne-park	992	15	0
S. Allared, jun., West Kensington	979	0	0
James Puzzey, Hornsey	970	0	0
W. Harris, Camberwell	947	0	0
Ford & Everett, Westminster	895	0	0
A. T. Catley, Pentonville (accepted)	871	0	0
F. Warr, Croydon	678	13	0

For alterations and additions to Edinburgh-road Board Schools, for the London School Board. Mr. E. R. Robson, architect:—

Tongue	£3,218	0	0
Rankin	3,149	0	0
Higgs & Hill	3,099	0	0
Wall Bros.	3,093	0	0
Oldrey	2,937	0	0
Scrivener & Co.	2,905	0	0
Grover	2,888	0	0
Shepherd	2,808	0	0
Stimpson & Co.	2,773	0	0

For two houses in Harrington-road, for Mr. W. Cassels. Messrs. Ernest George & Peto, architects. Quantities supplied by Messrs. Stoner & Sons:—

Simpson & Son	£15,540	0	0
Williams & Son	15,125	0	0
Colls & Son	14,458	0	0
Brass	14,371	0	0
Ashby Bros.	14,147	0	0
McLachlan	13,940	0	0
Mark Manley	13,050	0	0
Stephens & Bastow, Bristol	12,768	0	0

For warming and ventilating, by their new Hydro-Caloric Apparatus, the Grand Saloon, Sandringham, for the Prince of Wales:—

J. Weeks & Co., Chelsea (accepted).

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The Builder.

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The Egypt of the Past.



EGYPT has always been a fertile land to the historian. From the seventeenth century, when the most extravagant and absurd ideas were promulgated and blindly accepted by the reading public of that period, until the present day, which has brought forth the sound and durable works of Wilkinson and Brugsch, and Dr. Birch's numerous monographs and treatises, the bibliography of Egypt flows along in uninterrupted streams. To the list of works which are of profit and entertainment to the reader, Mr. Erasmus Wilson's "Egypt of the Past" must be added.* Though not so large as the histories of the first two writers above mentioned, and not pretending in any way to be exhaustive, this work rightly commands a place in the libraries of all who are desirous of keeping themselves *au courant* with the latest developments of thought and contemplation about the many mysteries which, in spite of all that has been said and written upon Egypt, still cling with undiminished force to the land of the Nile. Mr. Erasmus Wilson devotes his first chapter to the origin and early inhabitants of Caucasian type; Thinis, the capital of Mena; the first Pharaoh; the Osiris myth, which embodies the whole scope of moral philosophy and the eternal condition of the soul in a future world; and a summary of the events of the first dynasty, the date of which may be placed at a distance of about six thousand years from our day. The salient points of the history of this remote dynasty include not only the erection of Thinis, but the Mausoleum of Osiris at Kom-es-Sultan, the diversion of the bed of the Nile, the building of the Pyramid of Sakkarah, and the formulation of two of the principal chapters of the Ritual or the Book of the Dead. Literature at this time was not altogether unknown, for we have written evidence of the progress of research in anatomy and medicine during the reign of the successor of Mena, and the flint flakes which formed the surgeons' knives and lancets are still preserved. The late Prisse d'Avennes, one of the most accurate draughtsmen of Egyptian antiquities,—an art in which no one has excelled him but the lamented Joseph Bonomi,—found at Thebes a small case containing a few very fine flakes of silex, of the size of a fish-scale, neatly mounted on little cedar-wood handles, evidently a set of lancets. But the use of a useful article must not be held to favour, according to the author, a developmental state of man as implied by the term "stone period," when stone was his only resource, since metals must have been in use among the Egyptians at the opening of the first dynasty, and possibly much earlier. A second chapter treats of the second and third dynasties; the language of the Egyptians, once so full of difficulty and doubt, was fairly well read by many, although, strange to say, without a universally accepted system of transliteration; the pyramid and tombs of Meidoum; the worship and cult of the sacred bull; and the building of the Serapeum. Mr. Wilson's remarks on the history and development of the language are apposite and lucid, but the consideration of the matter requires a large and comprehensive treatment, which would interfere with the limits proposed by the author to his work. A good grammar of the language with reference to the Coptic and Semitic philology with which it is involved, is still a desideratum with us. All that have yet been written are crude, tentative, and imperfect. The best and most readily obtained is probably that written by M. Le Page Renouf, for Messrs. Bagster & Son, at the suggestion of the late Mr. W. R. Cooper, an ardent archæologist and lover of Egyptian history, to whom in a very great degree the foundation of the Society of Biblical Archæology, and the formation of the series of "Records of the Past," is admittedly ascribed. There is, however, no doubt that the desire of learning to read Egyptian hieroglyphics is extending among us. Perhaps some day the Universities of Oxford or Cambridge may see the propriety of stimulating this really important branch of scientific knowledge by endowing a scholarship, or even the chair of a professor with the funds necessary for this purpose. Dr. Birch's "Introduction to the Study of Egyptian Hieroglyphics," London, 1857; Chev. Bunsen's "Egypt's Place," London, 1848-1867; M. de Rougé's "Christomathie Égyptienne," Paris, 1867; Brugsch-Bey's "Hieroglyphische Grammatik," Leipzig, 1872; the "Grammaire Démotique," published at Berlin in 1855; and many other works on this language, would enable any competent scholar, with sufficient leisure at command, to master the difficulties of the language in a comparatively short space of time, an acquaintance with the cognate languages not being really so imperative as might be supposed.

Of the builders of the Pyramids, and of the Sphinx, and the obelisk worship of the fourth dynasty, to which Mariette attributes the date of 4235 B.C., and Lepsius 3122 B.C., while Wilkinson is content with the assignment of the less distance of 2,450 years before the Christian era,—the author has much to say. A succeeding chapter relates the principal events from the fifth to the eleventh dynasty, say from 3951 B.C. to 3064 B.C., if we accept the furthest position assigned by Egyptian chronologists, or from 2240 B.C. to 2080 B.C. if we accept the more moderate theories of Sir Gardner Wilkinson. The history of those early dynasties is obscure; of their remains the chief are the pyramid of Unas, the tombs of Thi and Ptah-hotep, the pyramids of Meri-ra-pepi and Meren-ra, the city of Zan or Tanis, the family of Antef, and the expedition to the land of Punt, or "the South," in the reign of Sankhara, the fifty-eighth monarch of the Royal Fasti commemorated in the Tablet of Abydos. The productiveness of the black soil of Egypt, we are told, annually enriched by the inundations of the Nile, has become proverbial. By the expenditure of very little labour, always a cheap commodity in Egypt, the population was supplied with everything necessary for food and raiment, but luxury and refinement clamoured for more. Caravans of Arab traders made regular journeys between the Nile and the South, and returned laden with spices, perfumes, balsams, frankincense, and precious woods. The South was the "Ophir" and the "Punt," or "Pount," of the Egyptians, and its produce was sought after most eagerly. Punt was a generic name for the whole southern region; it lay to the south of Abyssinia, between Bab-el-Mandeb and Cape Guardafum, and at a later period embraced the opposite coast of Arabia. Brugsch, whose authority and statements have been very generally accepted throughout this work, mentions an obscure tradition that Punt was the original home of the gods, the Ta-neter, or "Holy Land," whence the Theban triad of Amen, Maut, and Khons, the father, mother, and son, travelled to the Valley of the Nile, and there laid the foundation of the Egyptian empire. On the coast of the Delta, which, at this remote period, was in all probability a very swampy district, densely overgrown with the low vegetation usually occurring in the warm marshes of tropical latitudes, and which was first brought under cultivation in the vicinity of This or Thinis, and Memphis, the towns of Tanis and Heracleopolis Parva had been founded by Semitic wanderers over the sea. These colonists gradually penetrated into the interior country, and there came into collision with the Egyptians coming from the north, and adopted their culture and their manners. At the same time, however, it is recorded by the talented but anonymous author of Baedeker's "Egypt," they retained their independence under kings of their own, who, during the period of the sixth, seventh, and eighth Egyptian dynasties, form the ninth and tenth contemporaneous dynasties of the Heracleopolites who, from the year 2691 B.C. onwards, ruled over the Delta, and perhaps also the whole of Lower Egypt. The eleventh dynasty, which closed the sway of the Heracleopolites, was not esteemed by the Egyptians as a strictly legitimate line.

The twelfth dynasty finds Egypt still in an unsettled state. Amenemhat I., the founder of the line, builds a wall along the eastern frontier

* "The Egypt of the Past." By Erasmus Wilson, F.R.S., Author of "Cleopatra's Needle, with Brief Notes on Egypt and Egyptian Obelisks." With forty-six illustrations. London: Kegan Paul, Trench, & Co. 1881, 8vo.

of the Delta, to oppose the invasions of the Asiatic races, and founds the temple of Karnak, so well known to us from all illustrated works on Egypt. Subsequent monarchs add to the fortresses, temples, and public buildings, which, as in their magnificent desolation, so, too, in their monumental teaching, still form a prominent feature of the country. One of the principal political events in this age is the regulation of the traffic between Egypt and Central Africa by Usertesen III., or "the Great," to whom, in recognition of his meritorious and memorable reign, Thothmes the Great subsequently erected a memorial temple, that his name might be remembered with as much sanctity in Nubia as that of Snefru or Sennefern, of the third dynasty, was in the valleys of Sinai. The space at command on this occasion does not allow us to say much of the "Hyksos" or shepherd kings, the exponents of the political power of the shepherd colonists, whose power was first felt in Egypt in the fourteenth dynasty, although they had entered the country long before as Semitic immigrants during the twelfth dynasty, upwards of 2,000 years before the Christian era. These newcomers, meeting with kindred spirits among the seaports of the Delta, and allying themselves with these and warlike Arabian tribes, at length became powerful enough to defeat the standing armies of the Pharaohs and obtain possession of the whole of Lower Egypt. Three dynasties belong to the victorious Hyksos: the fifteenth to the seventeenth; but they ruled during the fourteenth also, through the nominal reign of the Xoite kings. They applied the name of the Egyptian god Set to their own gods (Be'alim); and the andro-sphinxes yet preserved at Tanis with the portrait-heads of their monarchs prove that they employed Egyptian artists in their service. Perhaps, too, they themselves acquired a knowledge of Egyptian plastic arts. It is at the close of the Hyksos period that Abraham and Joseph arrive in Egypt, just before the success of the war of independence, the overthrow of the dynasty, and the erection of the new empire by Aahmes, who, succeeded by a long line of Thothmes I.-IV., and Amenhotep I.-IV. gives the crowning point of culmination to the imperial system of "Egypt of the Past." The foreign campaigns, extensive religious changes, numerous architectural erections, and enlargement of the boundaries of government which occur during this period are well described and carefully explained by Mr. Wilson, who has never failed to utilise throughout his book the newest evidences and the latest information which has been brought to light and accepted concerning the ancient history of Egypt. Of the nineteenth dynasty, made famous by the names of Rameses I. and II., and Seti or Sethos I.; of the twentieth, equally illustrious for its third Rameses, and succeeding monarchs of the same name, much is related, but we must refer the reader to the pleasant and instructive pages and careful illustrations of the book under notice if he would acquire a large fund of accurate information which has been herein sifted and condensed in a way which is both creditable to the author and thankfully acceptable to those who cannot spare the time to go through more prolix narratives of those times. Rameses III., the most splendid and wealthiest of the Pharaohs, won most of the treasures that he applied to the immense works of the Memnonium, the temples of Memphis and Heliopolis, and that dedicated to the god Khunsu at Karnac, from the foreign enemies who fell beneath his yoke. Part also he derived from mines, quarries, and commercial enterprises; for his fleets, like those of the Royal Lady Pharaoh Hatasu (the Elizabeth of Egyptian history, if we may compare English with Egyptian dynasties), brought spices and rarities from the rich shores of the Indian Ocean. For thirty-two years he filled the throne of Egypt, and devoted the last part of his life, which was broken by no great wars, to the domestic welfare of the valley of the Nile, which under his orders was planted with shady trees,—a deed which won for him perpetual gratitude. The fame of his wealth has, however, outlasted that of his achievements; and it was the superabundance of his riches which alienated him and his children from the severe simplicity of an earlier time. He lived, says Ebers, surrounded by a harem, in whose pestilent soil conspiracies were constantly fostered, to which he was nearly falling a sacrifice, and he ended his days as the mere tool of the priests, enervated and enfeebled, and scorned by his contemporaries, after sharing sovereignty with his son.

The concluding chapters of Egyptian history, as told by Mr. Wilson, who brings his book down to the close of the thirty-first, or second Persian dynasty, present to us the usual picture of imperial and national decadence. The growing power of Assyria had absorbed the kingdom, which had already fallen a prey to the Ethiopians. Psammetichus, with a league of twelve governors, and aided by Greeks and Carians, threw off the Asiatic yoke. A short period of revival ensued, but finally, under the Roman emperors, Thebes, the ancient capital of the mightiest sovereigns of the world, at length reduced to the condition of a provincial city, witnessed strange and unwonted changes of fortune. Many of the rock-tombs became the cells of recluses, many venerable monuments and noble portrait-statues were reduced to ruin on the ground of being the work of the heathen, and many temple-halls transformed into Christian churches. Much in the same way, the pious abbot of St. Alban's destroyed the Celtic literature which he found in buried chambers on the site of the ancient city of Verulam, and the evangelising pioneers of the Roman Christian church utilised the edifices dedicated to the gods of Rome, which they found ready to suit their purpose in many a city of Britannia. Many of the existing Egyptian architectural and historical remains will soon be hopelessly destroyed; shepherds feed their flocks where palaces once reared their imposing masses, and the inhabitants of the remoter villages, that have sprung up amid the ruined magnificence of bygone centuries, have so little respect for the remains of an antiquity whose teachings they cannot grasp, that they burn the finest fragments in their lime-kilns, cut up statues, pillars, and columns into mill-stones, build wretched huts with the finely-hewn blocks, and even chip the carved stones into small pieces in the vain hope of finding a forgotten or a hidden treasure. To the student, as well as to the ordinary reader, no small gain will accrue from a perusal of Mr. Wilson's work, which partakes of the character of a synoptical view of the history, language, and literature of Egypt, at the same time that it is full of suggestions which may lead some among us to view Egyptian relics in newer lights, and in ways that we have hitherto failed to adopt. The illustrations, both coloured and drawn on wood, are well done; they are fairly representative of the principal remains, and to a work which aims at being popular rather than abstrusely profound, they are indispensable. Its moderate size contrasts well with larger volumes, but for all this, little that is of importance to be said will be found to have been omitted. The lists of dynasties and the explanations of hieroglyphic characters will be found useful for reference and comparison with the detailed records in the body of the work. Mr. Wilson, in his preface, alludes to the newest discovery of twenty royal mummies in a subterranean excavation in the Western Mountain, opposite Thebes, and hints at the possible incorporation of their history into a second edition of his book. We can only trust that he will be enabled to carry this proposition into effect with as little delay as possible.

DIAMONDS AND PRECIOUS STONES.

There are few persons, even among those who are not the possessors of diamonds or others of the higher class of precious stones, who would not be conscious of the interest attaching to the subject. It is not merely that the objects treated of are in themselves very beautiful in texture and colour, but that they are surrounded by such attractive associations. They have formed the adornments of beauty and the appendages of luxury and power and magnificence in all ages. On the title-page of the work *apropos* of which we offer some remarks on the subject,* the very words,—"Diamant et pierres précieuses: bijoux, joyaux, et orfèvreries," seem to glitter on the paper. All the associations with the subject are courtly and sumptuous, so much so that Thackeray's satirical story of the "Great Hoggarty Diamond" seems a debasement of the great gem to the playing of a part quite below its proper associations.

A distinction may be drawn between those precious stones which are found in a more or less regularly-crystallised form, and those which do not crystallise and are found in irregular forms. The list of crystallised stones is, of course, headed by the diamond, which in its natural state is usually found either in cubes or in forms closely related to cubes, and formed, as it were, by the paring off of the angles of the parallelogram. The ruby and topaz belong also to the order of crystalline stones, which take mostly the form of six-sided prisms, either with parallel sides, or diminishing to a point at either extremity like two hexagonal cones placed base to base. The emerald and beryl also crystallise in hexagons, but with small diagonal facets at the angles. The sapphire is a crystal of six sides, two long sides opposite to each other, a long hexagonal prism. The topaz crystallises rather variously, most often in eight faces. The quartz, of which there are several varieties under what may be called specific names, such as amethyst, false topaz, &c., forms hexagon crystals with or without pointed ends. The turquoise, one of the most beautiful in colour of all the precious stones, is never found crystallised, but always in comparatively smooth, rounded forms showing a different type of origin from the crystallised stones. Almost the only other substances of value that do not occur in crystallised forms are pearls and corals, and these, of course, are formed under different circumstances from purely mineral stones, and belong to a different class.

A considerable portion of the first part of the treatise before us is occupied with considerations as to the various prismatic forms which can be artificially produced from the natural prismatic forms assumed by diamonds and other stones, and the theoretical and practical means of defining and proportioning them. There is also a good deal of information in regard to the various tests which may be applied to ascertain the genuine character and the degree of purity of crystallised stones. In regard to the relative hardness of various stones, this is naturally determined by the power of one stone to make scratches on another. If a diamond is scratched with one of the points of a crystallised topaz, the topaz point is blunted, and the mark which will be seen on the face of the diamond is only the dust of the topaz, which can be brushed off with the finger. But if the topaz is scratched with the diamond, the latter is unaltered, and the surface of the former is marked by a striation which can only be removed by further polishing down. It is on the base of this process of comparison that a kind of scale of comparative hardness has been formed represented by ten substances, of which diamond is the highest and graphite the lowest in the scale. It is a curious indication of the immense importance of chemical conditions of combination in determining the outward aspect of a substance, that these two extremes of the scale, the brilliant and hard diamond and the soft black graphite, are both chemically the same substance,—pure carbon.

The most valuable diamonds are those which are entirely colourless. Those with a blue tinge, though still more rare, are not so highly valued, as the actual beauty of the pure ones outweighs the rarity of the blue variety. One of the finest of the blue variety is, we believe, in the collection of Mr. Beresford Hope. Diamonds of a red tinge take still a good place; green diamonds are tolerably numerous, and rank lower; yellow ones are very common, and the least esteemed. The estimation of the value of a diamond is made according to a regular system of appraisement, for an account of which we refer the reader to the book, merely mentioning that it will surprise many of those who are not conversant with the subject to learn what a large proportion of a diamond is often ground away to dust in cutting it so as to make the most of its brilliancy. The greatest diamond in the French Treasury, the Regent, weighed, we are told, 410 carats before cutting, and 136½ after cutting, which seems an immense loss in size; but we presume it really increased the marketable value of the gem. Of course, the diamond dust taken off in cutting is not allowed to be lost, but it is useful chiefly for practical purposes, in forming in its turn the means of grinding down the faces of other diamonds, for this superb stone will yield to no tool but one made from its own substance.

The brief history, with the portraits of some of the great diamonds of the world, makes an interesting chapter in the work, and one cannot but be strangely struck with the extraordinary

* Diamant et Pierres Précieuses: bijoux, joyaux, orfèvreries, au point de vue de leur Histoire et de leur Travail. Par E.J. Jannettaz, E. Fontenay, Em. Vanderheym, et A. Coutance. Deuxième Édition. Paris: J. Rothschild. 1881.

importance attached to these small pieces of crystallised carbon, some of which have been the subject of diplomatic negotiations, and of even worse forms of fighting. According to the authors, the Regent, before mentioned, is admitted to be the most remarkable diamond in the world; but this may be national prejudice. It has had a remarkable history, and was at one time stolen and entirely lost, as was supposed; and on another later occasion was pledged by the French Government to a German banker in respect of a loan. Our own Koh-i-noor is ranked next; and there is a partial history and a drawing given of a mysterious diamond, the Mogul, which was in the treasury of Aurungzebe in the seventeenth century, but which has disappeared, unless, as some persons think, it is identical with the Koh-i-noor.

Those who are interested in learning to what processes the diamond is subjected to bring it to its best form will find some information on these points given, with one or two illustrations of the operators at work, which are, however, rather too small to show the *modus operandi* very clearly. It is, though, sufficiently described. The three principal operations are cleavage: then what our French authors call *brutage*, which is a rough formation of the shape previously to its being finished by the cutter, whose work forms the final stage. The cleavage is done when the diamond is not of a good shape originally, or has faults and imperfections which can advantageously be cut away. The work is carried on with a cutting diamond inserted by means of cement in a copper matrix at the end of a short stick, the diamond to be cut being inserted in a similar stick; thus a sufficient leverage is obtained, and an incision is made in the diamond to be operated upon, in one of its natural lines of cleavage (the direction of which is deduced from the angles of crystallisation), and it can then be split along this line of cleavage with a knife and a hammer. If the diamond is naturally found in a good shape for working upon, and free from blemish, there is no need for cleavage; but the *brutage* or rough-shaping is the only stage before the final cutting and polishing. The rough shaping is carried on by two diamonds worked upon each other, also carried at the ends of sticks as in cleavage, but of shorter and stronger ones, as the diamond has to be shaped by mere force in rubbing and beating one against the other, and requires the exercise of considerable strength. In both cases the operator must be very well acquainted with the habits of crystallisation of the diamond, and the rough-shaper, of course, really decides its ultimate form, the work of the cutter being really rather polishing than cutting. The polishing is done on a wheel served with diamond-powder in very fine olive oil. The powder comes from the cleavers and shapers, the former of whom wear leather aprons, one side fastened round their waists and the other side to the edge of the table at which they work, so that all minute fragments may be collected.

The latter part of the work is occupied with remarks upon jewelry and goldsmiths' work generally, with illustrations; considering the subject from an artistic point of view. In this light, however, this part of the subject is not treated so exhaustively as to call for any special consideration in our columns, where so much has been said on the subject of artistic workmanship; and our language is rich in books on this part of the subject. The special interest of the book we have been speaking of lies in the thorough statement which it gives of the qualities of the diamond and other precious stones, and of the theory and practice of working them. In regard to this, which is its main object, the work displays that logical treatment of the subject *ab initio* which is such a praiseworthy characteristic of French technical publications generally. This is the prosaic side of the subject certainly; and some persons, especially of the sex whose privilege it is to be decked with these beautiful quintessences of colour and light, may think they would rather contemplate the beauty of the finished object than follow its history into the workshop. But they must not forget, in admiring the jewels with which they set off their own beauty, that there is a moral in connexion with them. It is given in a concentrated form by Herrick, in a little poem wherein he cautions some fair "Julia" or other against being proud of her beauty and of her sparkling eyes:—

> "Whenas that ruby which you wear
> Sunk from the tip of your soft ear,
> Will last to be a pre-ious stone
> When all your world of beauty 's gone."

STRAWBERRY LEAVES AND BLACK DIAMONDS.

The coronet of an English Marquess, as many of our readers are aware, is a golden circlet, on which four pearls are interposed between as many golden strawberry leaves. The rank in the peerage is marked by several characteristics. Originally the President of the Marches,—there was a *Marquis de Septimanie* in Carlovingian times,—the distinctions which now attach to the title in England, of "Prince," and "Most Noble," are those of the eldest son of a Duke, to the heir of which, as originally a sovereign title, the above dignities apply. And some English Marquesses, as Lord Londonderry, with 60,000 acres of landed property, and Lord Bute, with 116,000 acres, may well look down on many a German or Italian Duke.

It is of the first of these magnates that we now have to speak, as having added,—shall we say, a new lustre to his coronet?—at all events, as replacing the ancestral pearls by black diamonds. In other words, Lord Londonderry has added to his rank, wealth, and illustrious descent the rare novelty of becoming a retail coal dealer. The expression may raise a smile, but we are by no means sure that it may not be a smile of that agreeable kind which is permitted to those who win. At all events, Lord Londonderry is now doing what many persons who are inconvenienced by the magnitude of their coal bills have long begged and prayed some great coal-owner to do,—selling his own coal retail in London. We have before us a note from the wharf, St. John's Wharf, Millbank, on which what is intended for the coronet of a Marquess, is duly stamped,—*apropos* of which we recommend those whom it may concern to have a correct drawing substituted for what we can only call a diagram. Joking apart, if the Marquess of Londonderry shows that by fair and open dealing he can afford to reduce the price of Wallsend coal to the Londoner by 15½ per cent., there will be many persons of opinion that he has added a new lustre to his coronet by so doing. We observe that on the day on which the price of 22s. a ton for Newcastle coal, delivered within four miles of the Wharf at Millbank, is quoted by the agents of the Marquess, six of the most respectable firms in the London coal trade advertise best Wallsend coal at 26s. In the same paper, however, there is an advertisement of apparently the same quality of coal on sale by a proprietary company at 18s. a ton. We do not affect to be in a position to advise our readers on the subject, further than to hint that it will be well for them to put the question to the test. It has long been matter of doubt and debate how it was that the price of coal at the pit's mouth was quintupled or sextupled by the time the mineral was put on our fires in London. Very much has been said as to a coal "ring." The truth of this will now be put to the test. The quality of coal has to be considered in the first place. We apprehend that there is no better than that which the Marquess of Londonderry can supply; but here we await the opinion of the expert.

There are several kinds of "Wallsend" coal, and the size of the "double-screened" coal, as delivered to the householder, is an element of value. The expenses and risks of delivery are large, and the temptation to the individual dealer to cut in and undersell a ring, if such there be, and if they keep up a fictitious price, is great. Therefore, it will be a metropolitan benefit to have this matter set at rest, as it is likely now to be. If Lord Londonderry can send into our cellars, within four miles of Millbank, the best Newcastle coal at 22s. a ton, there is no doubt that the merchants will have to come down to that price. We speak with due reserve, knowing that there is a difference between the beginning and the end of any new enterprise. But the usual elements of failure seem absent in this case. There is no needy urgency, no want of capital, no want of thorough practical knowledge of the case, no want of command of the mineral to be sold. Under these circumstances, the difference between 26s. and 22s. a ton is worthy of very serious attention. If Lord Londonderry can permanently bring down the price of coal in London by the simple and legitimate mode of dispensing with intermediate agency between the pit in the North and the edge of the wharf on the Thames, he will be better deserving of a statue than some persons who have been or are to be gratified by that mark of the gratitude of their contemporaries.

THE TRANSACTIONS OF THE INSTITUTE OF ARCHITECTS.

If we felt some doubt, during the progress of last session of the Institute, as to the advisability of spending so much in printing for immediate use incomplete abstracts of the papers read, we have no doubt whatever as to the advantage of issuing the whole Transactions of the session in a volume like that now before us. When the papers were issued in their complete form during the progress of the session they were necessarily hurried in regard to revision, and, coming out in this pamphlet form, we should surmise that their natural fate often was to be thrown aside until the volume was complete for binding, and very possibly never looked at again. Coming to the subscribers in the complete form in which the present volume comes, printed on excellent paper, and supplied with admirable and carefully-drawn illustrations, the Transactions certainly assume a more attractive form than they have ever assumed before. The only drawback lies in the absolute necessity of printing a certain amount of the matter twice over, in order to supply the immediate report of the paper necessary as a basis for the discussions. It becomes, however, in this light, simply a question of funds. If the Institute can afford it, the result seems to us quite worth the extra trouble, when we consider it as a means of representing adequately what has been done during the session. In this respect the matter seems to concern not only members of the Institute, but also the manner in which the doings of that body are presented to the outer world. We hope that, notwithstanding the semi-private form of publication to which the Transactions of a society are limited, it will be thought worth while to give to a large section of the public press an opportunity of forming and expressing an opinion upon the merits of this year-book of the central architectural institution of the kingdom, and of the result we should feel no doubt. We say this without partiality, having by no means always supported the action of the Institute, or the manner in which their Transactions were got up; but we feel sure that no cultivated and impartial reader could take up this volume without being struck by the varied interest of its subjects,—artistic, archæological, and practical,—and the very thorough manner in which they have been gone into. So little seems generally known in the ex-architectural world as to the work the Institute of Architects is really doing,—the reports in the daily papers being generally of the most meagre description,—that we imagine many non-professional readers would be considerably surprised to find so important a volume as this issued as the result of one year's deliberations.

As a practical book of reference on several important subjects, this volume has something like a permanent value. We find, first, the very important subject of barrack-planning and construction, treated by Mr. Ingress Bell, both historically and practically, and with typical plans of what has been done in past and in modern days. One of these plans of an old barrack, that in the Savoy neighbourhood, has a value in itself, as it is a hitherto unpublished plan of an old and interesting corner of London in its former state. The plans of the typical modern English barrack are in most respects good model plans, though we are unable to understand why it should be supposed that only with the officials of the War Office could such plans have been matured; and we quite concur in the remarks made in the course of the discussion in regard to the conduct of the Government in selecting a plan out of a competition as the best plan for cavalry barracks, and then taking the planning into their own hands, and leaving the architect with the privilege of putting the outside shell to it. This illustrates only too well the average Government idea about architecture in this country; but in any case the essay, with its illustrations, forms a useful contribution to the literature of the subject. We may point out one defect in the plan given of married soldiers' quarters in connexion with brigade depôt barracks; all these are residences with one small bedroom only. It may be presumed that married soldiers, like other people, will have children; indeed, as there is a schoolroom provided in connexion with the block, it would appear that the War Office has contemplated this contingency. It is not desirable that there should be only one bedroom for parents and

children after the latter have passed infancy, and the going back to this arrangement in Government barracks is to be deprecated. If considerations of space render an extra room impossible, the solution would be found in providing a turn-up bed for the children in the living-room, to be let down at night. But there is no evidence that the authorities have considered the subject at all.

Another practical subject of far more general interest at present, that of electric lighting, is illustrated both with pen and pencil in the paper read by Mr. Slater, and which will be found to be a very clear and useful *resumé* of the state of the matter at present, as affecting the great public question of artificial lighting for everyday use; and the diagrams accompanying it, and illustrating one or two of the leading systems, are very well executed, and add much to the usefulness and interest of the paper. On the matter of Quantities, which formed the subject of another lengthened paper and discussion during the session, we have previously expressed our mind. The subject is chiefly of interest to professional men only; they will find in this volume most of the arguments for and against the undertaking of quantity-surveying by the architect very fully given, and, like the artist whose colours were mixed for him, and who "had nothing to do but shove 'em on," the reader of the Quantities paper and discussion will have nothing to do but read the arguments which are all prepared for him, and then make up his mind which is the best. Last, but by no means least, among the practical papers we have the very full and able one by Mr. E. C. Robins, which in its full form as given here is a much larger and more elaborate essay than either was or could have been actually read at the meeting; and though in general we should not approve of the system of publishing in Transaction volumes what was not really said at the meeting, there is a reasonable excuse for it in this case, in consideration of the very great importance of giving a general summing up of the subject. In this respect we have no hesitation in saying that this volume of the Transactions is worth possessing, if only on account of the paper and discussion on this subject of sanitary science. Those interested in the subject will find there an admirable all-round view of it by an architect who has given much thought to it, and a discussion embodying the views *pro* and *con.* of a number of gentlemen, nearly all of whom had acquired a special right to speak on the subject; for in this respect the discussion was a very well-ordered one, and there was very little indeed of the mere talking for the sake of talking, which it is usually very difficult to keep out of such discussions.

In the archæological department of the Transactions the most important subject is the Roman villa at Brading, of which, we are glad to see, the Institute have been able to publish some very good illustrations, including coloured lithographs of some parts of the mosaic floor designs. The other archæological paper, by Mr. Stevenson, bearing the title, "Historical Documents," has less practical usefulness. The writer of it, in common with others of the party to which he belongs, seems unwilling to see two sides of a question; and because every relic of an old building and record of an old custom is interesting, as it unquestionably is, he puts aside the fact that there are at times still more important considerations bearing on the requirements of the present day, and that the due fulfilment of these may not be compatible with the preservation of every morsel of old brick or stone merely because it is old. The paper was the occasion of a smart and somewhat unkind retort by Sir Edmund Beckett, who, however, certainly had the best of the argument in a common-sense point of view.

The paper which was read upon Persian architecture and construction, written but not read by Mr. Pardon Clarke and Mr. Hayter Lewis, is, we are glad to see, also supplied with illustrations of the general plan of the style of building referred to, and of the diagrams of the typical form of fretted roofing belonging more or less to all styles connected with or influenced by Arabian architecture. The paper would, perhaps, have been better named "Modern Persian Architecture," or "Persian House Architecture," as this is the part of the subject it more especially illustrates. As Mr. Fergusson remarked in the discussion, to propose to treat "Persian Architecture" as a whole in a single evening's paper would be to seem ignorant of the great extent and intricacy of the subject.

In conclusion, we may observe that the result quite bears out the correctness of the views of the present management of the Institute in regard to diminishing by nearly one-half the number of subjects to be treated of during the progress of a session, and setting apart a separate evening for the full discussion of each subject. To obtain fourteen or fifteen good papers in one session, such as shall really show thought and consideration, and be practically suggestive, is next to an impossibility, as every secretary who is in earnest in his business has found to his cost. Hence, in such a case comes the almost absolute necessity of filling up with mere perfunctory papers, which are read to oblige the secretary, or because the reader of them wishes to bring himself into notice. The reduction of the number of papers makes it much more possible to secure really good ones; and we have here a volume of which we may say that nearly all the contents are worth considerate reading. We may assume that some part at least of the successful result is due to the assiduity and intelligence of the secretary, Mr. William H. White, in whom the Institute have found the right man in the right place.

STEAM LOCOMOTION FOR STREET TRAMWAYS.

Under the auspices of the Liverpool Tramways Company and of the Corporation of Liverpool, some trials are about to take place in that city to test the capabilities of tramway locomotives. One of the locomotives that will compete,—that made under Matthews's patent,—we had an opportunity of seeing last week at the works of Mr. F. W. Jackson, Kingsbury-road, Ball's-pond, favourably known to some of our readers as a manufacturer of builders' plant and machinery. Mr. Matthews's engine is in all essential particulars a miniature railway locomotive, weighing about five tons, but combining certain modifications to meet the exigencies of street tramway traffic and the requirements of the Board of Trade. The successful application of steam locomotion to street tramways, under the conditions and restrictions to which we refer, has been an exceedingly difficult problem to solve, if, indeed, a solution has yet been arrived at. Upon this point, the Liverpool trial may afford some evidence. For our own part, we are bound to confess we look rather to electric power than that of steam to remove existing difficulties, but that may not be yet. To conform with a condition imposed by the Board of Trade, all working parts of the engine are encased so as to prevent the frightening of horses. To meet this particular requirement, it would only be necessary to enclose the working parts on the outside, but the mud and dust of street traffic render it desirable that the cylinders, pistons, cranks, &c., should be completely encased, and this is effected in Mr. Matthews's engine, in which the whole of the driving machinery is arranged on the outside of the frame-plates, and enclosed in a close casing. The engine can be driven from either end,—a necessary provision for all tramway engines which do not travel continuously on circular routes, but which need reversing at the end of each journey. It is one of the conditions of the Board of Trade that the driver of the engine must be right in front, so that he may keep a thorough look-out, and have perfect command of the machine. In the engine which we are describing the boiler is of the locomotive type, working, however, with a pressure of 150 lb. of steam to the square inch. The water is carried in side tanks, in which is placed a patent condenser for the exhaust steam, the tanks being connected by a pipe. Smoke is prevented by the use of smokeless fuel. The regulator and reversing levers are placed at each end of the engine, and at each end there is a powerful brake to be operated by the driver's foot. The engine is covered by a roof, and the boiler is enclosed with a casing, the upper part of which is fitted with sliding glass panels or windows. The total height is about the same as that of a passenger tram-car. The firebox is necessarily at one end only of the engine, and as it is not proposed to employ a stoker in addition to a driver, it is obvious that the driver can only be near the stoke-hole when the engine is travelling in one direction, and, indeed, even when he is driving from the firebox end of the engine, he will hardly be able to bestow any attention on the fire. Under these circumstances, arrangements are made whereby the fire, being made up before the commencement of each run of four or five miles, will need no further attention until that run is completed. Other conditions imposed by the Board of Trade, and which Mr. Matthews believes he has satisfactorily complied with, are: that there shall be no steam or smoke given off by the locomotive; that there shall be no noise like that caused by the blast of a railway locomotive or a steam road-roller; that the engine shall be provided with a steam brake capable of bringing it up, when going at full speed, in its own length; that the wheels of the car which is being hauled shall also be fitted with steam brakes, acting, of course, simultaneously with those on the engine; and that where the speed exceeds eight miles an hour the steam brakes are to come into action automatically. Nearly all the working parts, such as cylinders, piston, cranks, wheels, and axles, are of steel, and the workmanship appears to be excellent. In the design of the engine, special attention has been brought to bear on the combination of simplicity and convenience, the working parts being as few and simple as possible, with the view of securing thorough efficiency and economy of maintenance. The cost of this locomotive, we understand, is about 500*l.*

THE SANITARY CONGRESS AT VIENNA.

The meetings of the *Deutscher Verein für öffentliche Gesundheitspflege* and the *Verein für Gesundheitstechnik* have this year been held at Vienna, and were convened for the same time, in order that each might in some measure profit by the deliberations of the other, and that subjects of interest to both associations might be treated in joint discussions. From their titles it will be seen that the first named (and more important) society has for its object the practical application of sanitary measures, while the latter deals with the technicalities of hygienic science.

Associations dealing with sanitary matters abroad would seem to have originated from older societies of a more strictly medical character, the importance which sanitary reform has acquired during late years as a social question having led to the bodies which were at one time branches of the societies to which reference has been made becoming independent associations. The choice of Vienna was not inappropriate as the seat of this year's deliberations, the Austrian capital having lately given much attention to sanitary matters; and the attendance of representatives from all parts of Germany was evidently by no means lessened on account of the Congress meeting in a neighbouring State. The municipal bodies of Munich, Königsberg, Breslau, Halberstadt, Berlin, and Dantzic were represented; the last-named city by Herr von Winter, under whose energetic administration the recent important improvements in drainage were carried out. The Prussian Ministry of Public Works, The Hamburg Medical Board, and the Universities of Leipsic, Königsberg, and Pesth also sent delegates, and amongst the guests were also Herr Lammers and Herr Lorent, the celebrated hygienists from Bremen, and Mr. Lindley, jun., chief engineer of the Frankfürt Sewerage Works.

The preliminary social meeting which is customary on such occasions in Germany, took place at the rooms of the Musical Association, and friendly greetings were exchanged by the various members of the Congress, amongst whom the presence of Herr von Pettenkofer (the founder of the present system of sanitary engineering in Germany), was noticed with special pleasure by his friends.

The President of the Congress was Duke Charles Theodore of Bavaria, himself a medical man, and in his somewhat arduous duties in the three days' meetings, he seems to have been successful in pleasing all parties. His opening address referred to the importance of practical sanitary measures, and to the past activity of the Society in dealing with them, though encountering the opposition of old prejudices and customs.

The central committee was formed of representatives of both societies, and after the municipal and other notable personages present had addressed the assembly, the separate Associations commenced their meetings.

Taking first the proceedings of the Society for Public Sanitary Measures, we find that

a paper on "The Hygienic Requirements of the Situation and Use of Cemeteries" was read by Professor Hofmann, of Leipsic, who expressed his opinion that the injurious effects of burying-grounds when near dwelling-houses had, as a rule, been exaggerated; and that any development of carbonic acid in graves of a certain depth was equally liable to occur in excavations for wells or other purposes. He considered that the custom of burying many in one grave was reprehensible, maintaining that where separate graves of 3½ square yards surface measurement, and of 1¾ yard depth were practicable, no danger could be experienced by adjacent dwelling-houses, provided that the situation were rightly chosen and a due order of interment observed. He referred to chemical analyses and statistics of mortality, as refuting the suggestion of infection arising, or of wells being contaminated, from the proximity of churchyards to habitations. He dwelt on the necessity of choosing a dry soil, and a situation free from chances of inundation, as an excessive quantity of water caused a more rapid decomposition to take the place of the natural slow and equable oxidation of organic substances. As a normal rule he suggested that 11 yards was a sufficient minimum distance for dwelling-houses to be situated from a cemetery. Dr. Siegel, of Leipsic, confirmed the statements of his fellow-townsman, and as to the time which should elapse between interments he suggested ten years for adult graves and five years for children's, provided that the site of the cemetery had been suitably chosen, and that the final decision on such a question rested with competent authorities. After twenty years' cessation of interments, he considered that building over a burying-ground was allowable,—of course, after removal of any coffins or of any human remains. In the discussion which followed, the importance of the subject was fully recognised, but the views of the readers of the papers were in some cases dissented from.

The second day's proceedings dealt with the general subject of drainage, and more particularly with the question whether the system of main channels caused the generation of noxious gases, and the consequent spread of infectious diseases. Reference was made to the discussions which have often taken place in English professional circles on this subject, and to the efforts made by the more exact German school of hygienists to arrive at a solution of the problem. Dr. Soyka recorded the facts at which he had arrived by means of experiments made in the hygienic laboratory of Von Pettenkofer. He made a vigorous attack upon the opponents of the modern system, and remarked that in his report on the outbreak of typhus at Croydon, Dr. Buchanan had neglected certain important factors in forming his opinion, and that certain results were really accidental, instead of being consequent on the system of drainage. He then alluded to the improved health of Hamburg, Frankfürt, and Dantzic, since the modern plan of drainage had been adopted. The city of Munich afforded him elements for some interesting arguments. That city has 321 streets without any drainage, seventy-seven with old *cloacæ*, while only thirty-five have sewers of modern construction. The mortality from diphtheria was highest in the undrained streets. As to typhus (which is known in common with diphtheria to be most prevalent in low-lying situations) the mortality in parts of the city recently drained was less in the epidemic of 1875 than in the previous one; and the reduction of mortality was greater in the low-lying streets than in those at a higher level. Dr. Soyka cited these instances as affording a potent argument against those who blame the modern system of drainage for certain epidemics of infectious diseases.

In his address on the same topic Dr. Von Roszahegyi, of Pesth, confirmed the statements of his colleague, and remarked that his own practical experiments at Munich and Frankfürt had led him to the conclusion that the air in drains is carried forward with the stream, and follows the descent of the sewer, while currents of air in a contrary direction are unfrequent and limited in extent. He considered that no perceptible influence is exercised by wind or by the temperature of the exterior air. After some remarks from Herr Von Pettenkofer and Mr. Lindley, Dr. Lissauer, of Dantsic, fully confirmed the preceding speaker's remarks about the direction in which sewer air is carried. There had been cases, he admitted, of defects in pipes (capable of being easily remedied) having admitted sewer-gas into houses, but he maintained that where cases of illness had occurred they had been caused by a want of resisting power against some prevailing epidemic, and not from direct infection. He, however, quite admitted the necessity of keeping sewer-gas out of houses, and went into some details as to the most suitable preventive appliances. The result of the discussion was highly gratifying to the delegates of such capitals as have seen the sanitary and economic advantages of the modern system of drainage, and have not hesitated to make the pecuniary sacrifices necessary in the interests of the public health.

The other society did not enjoy such a large share of public favour in its first two days' sitting, but the more limited scope of its operations readily accounts for this fact. Amongst the matters treated were "The Principles of Systematic Drainage as applied to Cities," and kindred subjects. Some interesting details were also given as to the progress made so far in the preparations for next year's Hygienic Exhibition at Berlin.

For the concluding day's proceedings both the societies were again united, the subject for discussion being "The Advantages and Disadvantages of Heating by Air," a topic interesting from a theoretical as well as from a practical point of view. The first address was by Dr. Märklin, of Wiesbaden, the president of the larger society, who spoke in favour of the present system of heating by air as being economical, and with proper management, free from any inconvenience in use. Dr. Von Fodór, of Pesth, spoke at some length, remarking that air thus heated loses none of its moisture, and even gains a little when passing through the channels used. He also dwelt on the facility with which the present system gave an agreeable warmth, but pointed out that a want of compliance with the proper rules for using air for heating purposes was sure to produce an unsatisfactory result. He concluded by observing that in a supply of hot air it was preferable, from a sanitary point of view, to have a large quantity at a moderate degree of warmth, rather than a relatively smaller quantity at a higher temperature.

The usual complimentary speeches were delivered at the close of the proceedings. On the previous evening the members of the Congress had been entertained in a hospitable manner by the municipal authorities. Besides the meetings we have recorded, the programme of the Congress included excursions to the Vienna water-reservoir, and to the Semmering.

The *National Zeitung* of Berlin, in commenting upon the meeting, remarks that an attempt was made to get through too much in the short space of time during which the Congress lasted. In addition to the detailed discussions we have referred to, the question of the use of alcohol was also debated at some length. The suggestion is made that when time is so limited, the papers should be printed and distributed, being taken as read. The saving of time would thus give more opportunity for those discussions which form such a valuable feature at scientific congresses.

ART AND THE CONDITION OF THE PEOPLE.

At the annual meeting of the Burslem Schools of Science and Art, a few days ago, Mr. William Morris, of London, delivered an address to the students, in the course of which he said:—Hold fast to distinct form in art. Don't think too much of style, but set yourself to get out of you what you think beautiful, and express it as cautiously as you please, but, I repeat, quite distinctly and without vagueness. Always think your design out in your head before you begin to get it on to paper. Don't begin by slobbering and messing about in the hope that something may come of it. You must see it before you can draw it, whether the design be of your invention or nature's. Remember, always form before colour and outline, silhouette before modelling, not because these latter are of less importance, but because they cannot be right if the first are wrong. Now, upon all these points you may be as severe with yourselves as you will, and are not likely to be too severe. Furthermore, those of you especially who are designing for goods, try to get the most out of your material, but always in such a way as honours it most. Not only should it be obvious what your material is, but something should be done with it which is specially natural to it, something that could not be done with any other. This is the very *raison d'être* of decorative art; to make stone look like ironwork, or wood like silk, or pottery like stone is the last resource for decrepitude of art. Set yourselves as much as possible against all machine work. (This to all men.) But if you have to design for machine-work, at least let your design show clearly what it is. Make it mechanical with a vengeance, at the same time as simple as possible. Don't try, for instance, to make a printed plate look like a hand-painted one. Make it something which no one would try to do if he were painting by hand if your market drives you into printed plates. I don't see the use of them myself. To sum up, don't let yourselves be made machines, or it is all up with you as artists. Much as I hate the iron and brass machines, the flesh and blood ones are more terrible and hopeless to me. No man is so clumsy or base a workman that he is not fit for something better than that. Well, I have said that education is the first remedy for the barbarism which has been bred by the hurry of civilisation and competitive commerce. To know that men have lived and worked mightily before you is an incentive for you to work faithfully now that you may leave something to those who come after you. What next is to be thought of after education? I must here admit that if you accept art and join the ranks of those who are to rise in rebellion against the Philistines, you will have a roughish time of it. "Nothing for nothing and not much for a dollar," says a Yankee somewhere, and I am sorry to say that is the rule of nature also. Those of us who have money will have to give of it to the cause, and all of us will have to give time, and thought, and trouble to it. And I must now consider a matter of the utmost importance to art and to the lives of all of us, which we can, if we please, deal with at once, but which emphatically claims of us time, thought, and money. Of all the things that are likely to give us back Gothic art in England, the cleaning of England is the first and the most necessary. Those who are to make beautiful things must live in a beautiful place. Some people may be inclined to say, and I have heard the argument put forward, that the very opposition between the serenity and purity of art and the turmoil and squalor of a great modern city stimulates the invention of artists, and produces special life in the art of to-day. I cannot believe it. It seems to me it stimulates the feverish and dreamy qualities that throw some artists out of the general sympathy. But apart from that, there are men who are stuffed with memories of more romantic days and pleasanter lands, and it is on these memories they live, as I say, to my mind not altogether happily for their art, and you see it is only a very few men who could have even these doubtful advantages. I abide by my statement that those who are to make beautiful things must live in beautiful places, but you must understand I do not mean to claim for all craftsmasters a space in those gardens of the world, or of those sublime and awe-inspiring mountains and wastes that men make pilgrimages to see; that is to say, not a personal share. Most of us must be content with the tales of the poets and the painters about these places, and learn to love the narrow spot that surrounds our daily life for what of beauty and sympathy there is in it. For surely there is no square mile of earth's inhabitable surface that is not beautiful in its own way, if we men will only abstain from wilfully destroying that beauty; and it is this reasonable share in the beauty of the earth that I claim as the right of every man who will earn it by due labour; a decent house with decent surroundings for every honest and industrious family; that is the claim which I make of you in the name of art. Is it such an exorbitant claim to make of civilisation, of a civilisation that is too apt to boast in after-dinner speeches; too apt to thrust her blessings on far-off peoples at the cannon's mouth before she has improved the quality of those blessings so far that they are worth having at any price, even the smallest? Well, I am afraid that the claim is exorbitant. Both you as representatives of the manufacturing districts, and I as representing the metropolis, seem hitherto to have assumed that, at any rate, there is not one family in a thousand that has established its claim to the right aforesaid. It is a pity though; for if the claim is to be considered inadmissible, then it is most certain that we have been simply filling wind-bags and weaving

sand-ropes by all the trouble we have taken in founding schools of art, National Gallery, South Kensington Museum, and all the rest of it. I have said education is good, is necessary to all people; neither can you if you would withhold it, and yet to educate people with no hope, what do you expect to become of that? Perhaps you might learn what to expect in Russia. Look you, as I sit at my work at home, which is at Hammersmith, close to the river, I often hear some of that ruffianism go past the window of which a good deal has been said in the papers of late and has been said before at recurring periods. As I hear the yells and shrieks and all the degradation cast on the glorious tongue of Shakspeare and Milton, as I see the brutal, reckless faces and figures go past me, it rouses the recklessness and brutality in me also, and fierce wrath takes possession of me till I remember, as I hope I mostly do, that it was my good luck only of being born respectable and rich that has put me on this side of the window among delightful books and lovely works of art, and not on the other side, in the empty street, the drink-steeped liquor-shops, the foul and degraded lodging. What words can say what all that means? Do not think, I beg you, that I am speaking rhetorically in saying that when I think of all this I feel that the one great thing I desire is that this great country should shake off from her all foreign and colonial entanglements, and turn that mighty force of her respectable people, the greatest power the world has ever seen, to giving the children of these poor folk the pleasures and the hopes of men. Is that really impossible,—is there no hope of it? If so, I can only say that civilisation is a delusion and a lie; there is no such thing and no hope of such a thing. But since I wish to live, and even to be happy, I cannot believe it impossible. I know by my own feelings and desires what these men want, what would have saved them from this lowest depth of savagery: employment which would foster their self-respect and win the praise and sympathy of their fellows, and dwellings which they could come to with pleasure, surroundings which would soothe and elevate them; reasonable labour, reasonable rest. There is only one thing that can give them this—art. I have no doubt that you think this statement a ridiculous exaggeration; but it is my firm conviction nevertheless, and I can only ask you to remember that in my mind it means the properly-organised labour of all men who make anything; that must at least be a mighty instrument in the raising of men's self-respect, in the adding of dignity to their lives. Once more, "Nothing for nothing and very little for a dollar." You can no more have art without paying for it than you can have anything else, and if you care about art, as you must when you come to know it, you will not shrink from the necessary sacrifice. After all, we are the descendants and countrymen of those who have well known how to give the lesser for the greater. What you have to sacrifice is chiefly money: that is, force and dirt,—a serious sacrifice, I know; but perhaps, as I have said, we have made greater in England aforetime; nay, I am far from sure that dirt will not in the long run cost us more in hard cash even than art will. So which shall we have, art or dirt? What is to be done, then, if we make the better choice? The land we live in is not very big, either in actual acreage or in scale of fashion; but I think it is not our natural love for it only that makes us think it as fit as any land for the peaceful dwellings of serious men. Our fathers have shown us that, if it could otherwise be doubted. I say, without fear of contradiction, that no dwelling of men has ever been sweeter or pleasanter than an ancient English house; but our fathers treated our lovely land well, and we have treated it ill. Time was when it was beautiful from end to end, and now you have to pick your way carefully to avoid coming across blotches of hideousness which are a disgrace, I will not say to civilisation, but to human nature. I have seen no statistics of the size of these blotches in relation to the unspoiled or partially-spoiled country; but in some places they run together so as to cover a whole county, or even several counties, while they increase at a fearful rate,—fearful in good earnest and literally. Now, while this goes on unchecked,—nay, unlamented,—it is really idle to talk about art. While we are doing this, or letting it be done, we are really covertly rejecting art, and it would be honester and better for us if we did so openly. If we accept art we must atone for what we have done and pay the cost of it. We must turn this land from the grimy backyard of a workshop into a garden. . . . . When you have accepted the maxim that the external aspects of the country belong to the whole public, and that whoever wilfully injures that property is a public enemy, the cause will be on its way to victory.

ARCHITECTURAL EDUCATION.*

UNIVERSITY COLLEGE, LONDON.

I PROPOSE for the present session to select the subject of Greek architecture for treatment in detail. Greek is the architectural style which, within certain narrow limits, approaches nearer to absolute perfection than any other, and it may, with perfect truth, be called the fountain-head alike of modern and of all Classic architecture. Should the result of this attempt seem to warrant it, I shall propose, in another session, to expand, in the same manner, the treatment of some other part of the course.

The Course B deals with the science of architecture, that is to say, with materials, and with construction (as the art of putting materials together in a building is called). We shall take the principal natural building materials, such as timber, stone, and marble, and the principal manufactured ones, such as bricks, cement, and iron, and try to become familiar with their appearance, their properties, their strength, their fitness for use in a building, and the indications of their being of good or bad quality; and when we know something about each material we shall try to follow it out in the building, and consider the parts of a structure in which it may be best employed. Thus, after timber will come floors, roofs, and various framings. After bricks and cements, we shall consider brickwork and such subjects as the bond of bricks, and foundations. The building-stones lead us to walling, masonry, arches, vaults, and the most difficult constructions that the builder has attempted; while, after considering iron, we shall learn something about fireproof floors, iron roofs, and other applications of iron to building.

These lectures on materials and construction are included in the course of study recommended to civil engineers. The materials and methods employed by the builder and the architect are, to a large extent, the same as those with which the engineer has to deal, though they are usually employed in larger masses in his structures than in ours, and under different conditions, requiring, more often, very close calculation of the stresses they have to resist. I trust that the engineering students who may attend the course will give the work of this class a due share of attention. Some of them have carried off the highest prize which it has to offer. Others have failed to obtain a certificate, and have been chagrined at their failure. Yet the lecturer, the professor, the examination papers, and the system of making answers, are the same for all. Success depends solely upon the pupil. It may be impossible for him to be the first in any given year; but, with ordinary abilities, nothing but application is required to secure a certificate of having passed the examination with credit. Want of time has prevented hitherto, and no doubt will still prevent, much attention being given by this class to joinery, plasterers' work, and the other finishings of a building; but some care will be bestowed upon the construction of drains and the sanitary fittings connected therewith, though for the full study of sanitation I must refer you to the lectures of my accomplished colleague, Professor Corfield.

I shall direct attention, also, not only to the properties and use of these materials, but to their defects and failure. It cannot be too strongly impressed upon the mind that from the day the workman leaves a building the tooth of Time begins to attack it. Forces of all kinds tending to produce decay and ultimate destruction are at work, and while structures of colossal strength, like the pyramids of Egypt, may keep them at bay for thousands of years, ordinary buildings are not long before they begin to suffer. The failure of buildings, and the precautions to be taken to avert it and to remedy it when it has become serious, will therefore form one of the subjects of this course.

The collection of diagrams illustrating courses A and B, prepared through many years, as I have already stated, by Professor Donaldson and Professor Hayter Lewis, now reaches to many hundreds of examples, chosen with special reference to the purposes of these classes, and represented in drawings of great excellence. These are, by the kindness of the two past professors, still available for the purposes of the class. The larger portion of them relate to the Art course, but there are a considerable number bearing upon Construction.

Some useful specimens of building materials of various sorts are available for illustration of the lectures on Construction. The series of specimens is, however, not extensive, and I am taking steps to increase it, so as in a short time to make it very serviceable as an aid to instruction. The collection of illustrations is also constantly increasing. I have added, and shall add, diagrams, prints, and photographs, and I hope occasionally to make use of photography in another way,—that is to say, to exhibit once, if not oftener, some illuminated photographs, by way of giving a more vivid representation of ancient buildings than is possible by the aid of drawings or photographs seen in the usual manner.

Course C.—The course of lectures on Practice is not so long a course as either of the others, and is intended chiefly for young men who have become to some extent familiar with the routine of professional work, and especially for those who are about to start in practice, or have recently begun practice on their own account. It is my desire in this course to put the student in possession, to a certain extent, of the results of experience, so that he may know what he is likely to have to do or encounter when acting as an architect on his own account. I need hardly point out that a pupil or assistant, especially in a large office, while probably enjoying ample opportunities of working on plans and specifications, is not always,—in fact, not often,—brought into contact with the negotiations that the architect with whom he is has to carry on, may not see much of the supervision of works, and, in short, looks at the transactions relating to a building from the point of view of an irresponsible *employé*, and not that of a responsible professional man. The aim of these lectures is to teach students some of the things which they would otherwise have to find out for themselves when entering practice, and which they had far better know beforehand.

The course travels over the following subjects, beginning with what is most likely to be familiar, at least in part, and proceeding to questions that are more and more special,—the preparation of plans and specifications, and the ordinary routine of building operations, including planning for special purposes and requirements; the preparation of all the required documents, conditions of contract, &c.; the principles on which estimates are prepared, the supervision of buildings, the usual mode of stating building accounts, and the professional charges which the architect is entitled to make. The next series of subjects in this course deals with those aspects of architectural practice which relate to law. Foremost, and of great importance, the London Building Act, and other Acts regulating buildings which have been founded upon it. Then the law of light and air, of contract, of the tenure of land and houses, and some account of arbitrations and of such questions as are most commonly litigated in connexion with building operations. Lastly, I shall endeavour to give you a brief account of that class of professional work which all architects are liable to be called upon to perform in connexion with existing buildings, such as surveys for dilapidations and various purposes, valuations, and the like.

I am sure that it will be of service to many a young architect to be warned and instructed beforehand about his routine, his charges, his Building Act difficulties, the restrictions he has to cope with when building on leasehold land, or the risk he runs where ancient lights are interfered with, rather than to have to buy his experience in these and similar matters at an expense of money to his client and of vexation to himself.

To this outline of the course of lectures I propose to add some account of the method pursued. The objects to be kept in view are twofold,—first, to convey information; secondly, to make the students think for themselves.

A large portion of the lectures is unavoidably devoted to giving information. It is of great importance to fix in the minds of the students those facts relative to their future profession which are most needful for them to know; so, of necessity, much of the time which the pro-

* Opening lecture of the courses in Architecture and Construction at University College for 1881-82, delivered by Professor T. Roger Smith, on the 10th inst. (see p. 480, *ante*).

fessor and his classes spend together is devoted to telling, or illustrating, or recalling the most important of those facts.

I am very desirous of inducing the students to draw. It is by the pencil that an architect learns as well as designs, and if it is possible to stimulate the use of the pencil to any extent by what passes in this class-room, it will be most satisfactory to me and serviceable to yourselves. I trust that the sketches which I make on the black-board will be always copied in your note-books, and that you will make sketches from the diagrams hung up. I shall continue the practice which Professor Donaldson established of lending the diagrams to students, and I shall be delighted if they are much borrowed and much copied, and I shall have pleasure in offering prizes for the best sets of sketches illustrative of the lectures A and B, and shall hope to find that there is a keen competition.

But the most serious part of my task remains behind. Can I teach the students not merely to know something about buildings or parts of buildings, or to draw them, but to understand them?—feel their value as works of art or as specimens of construction, and penetrate through the outward and tangible aspect of a material thing to that inspiring something,—that reason, or design, or contrivance, or historic import which gives to a congeries of bricks and stones and mortar a value which in some cases is literally beyond all price? Can I make you understand why the choir of Westminster is lovely, or what the secret principles are which hang the fretted roof of its Lady Chapel in mid-air? Can I enable you to study, and to some extent comprehend, ancient designs, and so take the first step towards yourselves becoming designers? I do not know, but it will be my endeavour to do something of this sort, and if I can see that even to a very small extent I have been successful in making you think for yourselves, I shall be far more satisfied than if I find your minds crammed full of facts and dates, and matters which can be learned by rote, and which it is often possible to know without understanding them.

The method of lecturing established by Professor Hayter Lewis will be continued, at least through this session. It is a method more serviceable to the student than agreeable to the Professor; but I believe it affords a very good means of learning what is taught, and reduces to a minimum the risk of mistakes in your notes. The plan is this. The heads of a portion of the lecture will first be dictated slowly, sentence by sentence, and are to be written down by the class as I read them out; and then, after this is done, I shall go over and explain the portion of the subject which the notes cover. This ought to ensure correctness in your notes, and gives an opportunity for revising them to a certain extent; but I value it chiefly because it leaves the students free to listen with their eyes as well as their ears (and, believe me, the eyes help you wonderfully to understand what is said), without being distracted by the effort to follow the lecturer and fill the notebook at the same time. I may perhaps now and then vary this plan for a single lecture. Occasionally, at any rate, it will be desirable for you to hear, and me to give you, a connected discourse not disturbed by the breaks to continuity which such a system entails. I shall be sometimes glad, especially when trying to show you the principles that underlie architectural rules or practice, to be as uninterrupted as possible, and you will probably be the better for having occasionally to give continuous attention. When this is done I will take care that an outline of the heads of the lecture is provided for each of you, so as to leave you free to follow me.

It has been the custom, and one which I hope to follow as an additional means of interesting and instructing the classes, to take the students to one or two of the great buildings of London and to some large builder's yard, when the opportunity will occur of seeing in actual fact some of the matters which form the subject of our lectures, and where, perhaps, the habit of examining buildings and works in progress may be encouraged, and the method of investigating ancient work learned.

A notice of the routine pursued here would be incomplete were I to omit the examination and prizes. The examination, the results of which determine the prizes, takes place at the close of the session; it is entirely in writing or by sketches, the questions being printed, and the prizes are publicly presented at the college. An alteration has been made this session, by which the work of the entire year will be treated as one whole. Formerly it was divided into two portions, and the arrangements were such that only half the work done by a student was the subject of the final examination. An attempt to remedy this last year by holding two examinations was found inconvenient in practice, and this time the examinations at the close will cover the work of the whole session in each class. An examination, properly looked at, is an admirable feature in a course of instruction. It enables a student to recognise the progress that he has made, and compels him to make some use of what he has learned. I shall probably, therefore, introduce one additional examination during the session in each of the classes A and B, not to be counted towards the award of prizes, but solely for the purpose of aiding students. Let me add that it is most desirable that every person attending the class should attend the final examination, and do his best to obtain, if not a prize, at least a certificate. The prizes include two silver medals given by Professor Donaldson, and bearing his name, together with valuable prizes of books. The certificates are given to as many students as obtain a certain proportion of marks out of the total possible; and it is fair here to point out to you that the best way of obtaining a good proportion of marks is not to write long answers, and to bring in irrelevant things which the student knows, but which form no part of the correct answers to the question; but to write accurate and clear replies, which shall, on the one hand, answer every part of the questions, and, on the other, shall not travel beyond the questions, and to illustrate them, wherever possible, by well-drawn sketches. Where an answer is given, wholly or partly, by a sketch, I always, in marking the paper, first allot as many marks to it as would have been due to a correct reply in writing, and then add something more for draughtsmanship if the sketch shows any merit.

Thus far it has been my aim to show to you, gentlemen, what this college has been doing for years past, and what I, as its Professor, propose to endeavour to do in the coming session for such of you as become students. I must not close without some remarks upon what you must do for yourselves, and upon the degree in which our work here may be an aid to you in that which occupies you during the greater part of your time.

I have already said that in an office you learn practice,—in the class-room you learn principles. If this be so, it is not difficult for you to see that as you master principles here, you will find they enable you rapidly to get a firm hold upon practice elsewhere. Take the most important branch of your work, in the office or out of it,—your drawing. The arrangements of these classes do not, it is true, provide for instruction or, except just incidentally, for practice in drawing; but there is hardly a part of either the construction or the architectural treatment of a building which you will not draw far better when you know the reasons for its taking the shape it does. The simplest part of your work,—the working out of plans,—will explain what I mean. The beginner is often in difficulties as to the thicknesses of brick walls. I hope, when he has been through the part of this course which refers to brickwork, that the sizes of bricks and the mode of combining them into walls will be made clear to him for life. Another illustration may be taken from a more advanced sort of work. The elevation of a building ought to have,—I think, will have,—more interest for a student who knows something about the features employed, than if he simply copy them unintelligently. For example, if the Orders occur, he who knows something of how and where they originated, what their earliest forms were, and where they were matured, will draw with more understanding and pleasure, and will, therefore, be sure to draw them better than one who only knows that he has gone through a rather irksome task in drawing them out after some typical example. The man who has some general acquaintance with the forms of architecture and its history will be prepared to deal with whatever period or style he has to work at, as something not quite strange to him. The same thing is true of materials and constructions. When, for example, you understand the reason of the shapes and relative sizes of the timbers in a roof, and why their joints are shaped as they are, and what purpose each part has to serve, you will feel more interest in drawing such roofs as you may have to put into plans, and you will undoubtedly draw them with fewer mistakes. When you have been told what are the main peculiarities of the leading building-stones, or the sorts of timber most used, and when you know what marks indicate good quality, and what the reverse, you will not only find a walk round a building instructive, but may soon become able to make yourselves useful in aiding, to some extent, in the superintendence of buildings. At any rate, after having mastered some of the elementary principles of materials or of construction, you will be able to take in and assimilate the information which the accidents of practice bring within your reach.

As a general rule, I believe that a young man who has already spent some months or a year in an office is more likely to get benefit from these classes,—especially from the Construction class,—than one quite new to the subject. On the other hand, I believe, as I have stated, that to a youth just fresh from school or college, the opportunity of some systematic and scholastic teaching on subjects connected with his profession is of importance,—so much so as to outweigh any disadvantage arising from his being new to the subject. A student so circumstanced should attend the Art class, and that only, in his first year, and should take the Construction class the year after. If, however, a student has been a year in an office (much more if he has been a longer time) it may be advantageous to him to attend both classes in the same year. This is, however, partly a question of the amount of time he can give to the work at home which attendance here involves.

I hope it will be distinctly understood, and always borne in mind, that the student who wishes to get real benefit from these lectures must devote some time to them at home each week, besides attending his hour here. The notes should be carefully written out in ink, from the rough notes made in the room, and the sketches made from the black-board should be carefully and neatly copied into the permanent note-book. The books of reference mentioned should be consulted; but most and chiefly, everything connected with the subject of the lectures of which illustrations can be found should be drawn. The diagrams afford a mine of wealth of this sort, and the generous practice of lending them, under proper restrictions, to copy, affords an opportunity of making the fullest use of them. Much information may be gained by copying, sketching, or reducing these diagrams; but the student who wishes to make the most of his opportunities should also draw or sketch such illustrations in other books, or such photographs, or such pieces of actual work as come under his notice, and are of a nature to elucidate the subjects being treated. I have had the pleasure to receive excellent sets of illustrative sketches in previous sessions, and I repeat that I sincerely hope this may be the case in the present session.

Allow me to express my hope that most, if not all, students will attend the Art class. I believe it to be of the greatest possible importance, and that attendance at the Science class alone is a very incomplete and one-sided mode of education, even for an engineer or a surveyor, much less for an architect. It is hardly possible to convey to you how keenly a critical observer is sometimes made to feel the disgraceful want of knowledge which English architecture too often betrays. Features which are inaccurate are constantly to be met with in designs otherwise so simple that a very small amount of education would have insured correctness. Features that are incongruous are frequently put together, and spoil the effect of many a building which, had its author's cultivation only been such as his talents deserved, might have been a complete success. Of course, attendance in the Art class is no guarantee of correctness; but a very considerable amount of such information as no architect, no draughtsman, no civil engineer, ever ought to be without, is put within the reach of the students of that class, and I can venture so far as to say that no young man of intelligence who has gone through the course and worked at it fairly and thoroughly, ought to be able,—I think I may say would be able,—to design such incongrous elevations and details as would be found, if we went to look for them, within a hundred miles of the centre of this great metropolis.

As to the Professional Practice course, it is not designed for beginners, and probably few students who have been less than three years in an office will be able to reap the full advantage of attending it; while I hope that to many

who are much more advanced these lectures may be serviceable. They have been attended during the short time that they have been given by architects in practice as well as by senior students, and, as already explained, they will be directed specially to the requirements of those who are beginning, or are hoping soon to begin, practice.

In conclusion, perhaps, I may be pardoned if, passing away from the subject which has occupied our attention, I say one or two parting words about work and study outside these walls. In fact, I feel as if I could hardly close without some allusion to your own studies. Many topics might be touched upon; but I will limit myself to a passing remark or so upon each of four,—drawing, practical work, books, and the study of ancient buildings.

Before anything else, it is of importance to you to draw, and to draw well. You ought to be able to represent, fairly well, anything you see. And if you wish to attain this power, nothing is so useful as studying the human figure. The Slade school here is the best school for the purpose that I know; but those who cannot give the time in the day-time may be able to draw at one of the schools of art where the antique is studied in the evening. With your drawing-instruments you ought to be able to work as easily as an ordinary draughtsman using the pencil alone. To handle the tee-square and dividers thus readily requires long practice; but till this facility is completely attained, the instruments will always be a little in your way. Long before that time, however, you ought, so far, to master the use of them that all your ink lines shall be true and even, all your circles really round, and all your right lines really straight; and if this degree of steadiness has been perfectly mastered in a student's first twelve months, it is a not discreditable performance, and perfect command of the instruments will follow in time. Practice sketching things you see, especially portions of buildings; and, in short, strive to become, in every sense of the word, skilful, artistic, and rapid draughtsmen. Above all things, practise yourselves in designing. The power of originating architectural compositions may be latent in many of you; but effort is as much required to bring out that power as to make manifest any other latent capacity or gift. Design is fostered by study; but a man may be studious without a particle of inventive power, or may perhaps neglect invention for the attainment of knowledge, and by so doing impair his ultimate success as an architect. Practise designing, therefore.

Next in importance to drawing comes practical work of any sort. The most useful of all is to go into a workshop and learn to make something belonging to a building. By the time he has become able to make a four-panel door, a youth will gain such an acquaintance with construction as will prevent his making half the mistakes which disfigure most working drawings turned out by young hands. But whatever piece of practice of any sort is within reach, examine it, and get a share in it. The commonest office work done intelligently may impart valuable knowledge. To trace drawings or copy specifications, if only the young clerk determines to understand all that goes under his hand, is a means of gaining all kinds of instruction, and a six-roomed house, if only it be watched closely from day to day, would afford a fund of information as to materials and construction. Do not, therefore, neglect or despise the humblest opportunity of seeing or sharing in any sort of practical work which comes in your way.

The use of books has already been considered at some length. I should like to suggest that the student should not only by degrees form a library of the best books of reference (taking care to get the best), and that what he buys he should read; but that he should make use of the fine public libraries accessible in London, and in not a few of our great towns. There are a few good architectural books in the library of this college, free to students. There are some, I believe, at Sir John Soane's Museum; and the three great art libraries of the Royal Academy, the South Kensington Museum, and the Royal Institute of British Architects, supplemented by the Library of the British Museum and the loan library of the Architectural Association, furnish the London students with the means of consulting every book of reference that exists, and every illustrated treatise on our art, with little inconvenience, in some instances at absolutely no expense, and in other cases for a merely nominal fee. Do not, therefore, neglect the magnificent opportunities for making use of good books which exist within your reach.

Last, but by no means least, comes the study of ancient buildings. This is alone the source of inspiration and of accurate knowledge for the architect. Set it down in your minds that your best opportunities are those which give you time to measure or sketch some good example of English or foreign architecture, and that your training will remain incomplete unless one good long journey, or more than one shorter one, shall have enabled you to study examples on the Continent of Europe as well as English ones. It is not buying prints and photographs which puts knowledge into your minds; it is the process of patiently watching, examining, and, so to speak, absorbing the peculiarities of your subject while you draw it, that enables you really to know it; and, let me add, this is much more thoroughly accomplished by the process of making a set of geometrical drawings from the solid work than by representing it in a perspective, however cleverly and prettily that may be done.

If the variety and extent of study which is here hinted at,—prolonged, as it ought to be, through a series of years, and, in fact, more or less kept up through life,—seem formidable, let me remind you that the profession of an architect is not an easy one, and that it is only by unremitting, careful, and studious work that the student can fit himself for the discharge of its various duties and render himself equal to its responsibilities. But in almost every department of these studies there is much to interest and even to fascinate the mind. There is hardly any amusement undertaken for pure pleasure which is so enjoyable as a sketching tour through a district rich in works of architecture. There are few professions where the anxieties and hard work inseparable from all the real business of life are lightened by so many occupations of a kind which it is a pleasure to engage in, and none, so far as I know, where the advantages of variety of employment are so fully enjoyed. A calling such as you will find architecture to be, if you heartily throw yourselves into it, demands that those who engage in it should fit themselves for it by sufficient training and assiduous study. It will be my part to attempt to offer to my students a portion of this training, and I trust that those of you who join my classes will come prepared to study with such assiduity as to command, as well as deserve, success.

EXHIBITION OF WORKS OF ART APPLIED TO FURNITURE, 1881: AWARDS.

The following is the report of the judges appointed by the Council of the Society of Arts to make the awards of silver and bronze medals offered by the Society to the Designers and Art Workmen whose work was in the Exhibition of Works of Art applied to Furniture, held in 1881, at the Royal Albert Hall.

1. The collection of works of art included many branches of artistic handicraft, such as carving and inlaying in wood, ivory, &c., cabinet work and fine joinery, painting on various materials like wood, glass, and pottery, glass-cutting, the process known as *pâte sur pâte*, beating and chasing metals like silver and brass, wrought-iron work, modelled and glazed stoneware, and decorative needlework. The arrangement of the objects had been undertaken by the various exhibiting firms. A definite space had been assigned to each firm, who decorated it with hangings or with painted and gilt moulded work, or wood panelling, &c., and then disposed within it the various objects of furniture, &c. We were much pleased with the general good taste displayed in the separate divisions and in the aspect of the Exhibition as a whole.

2. In bay No. 1, occupied by Messrs. Crace & Son, the important cabinet of carved walnut wood was distinguished for its excellence. A number of hands, it was stated, had been employed upon the carving, which called forth our admiration. It was, therefore, not possible to single out one art-workman to whom a medal might have been awarded. For the same cause no distinction could be awarded in respect of the admirably-inlaid octagon table of walnut wood, the design for the ornamental border of which has been made by Mr. J. D. Crace. The painting done upon a cabinet of satin wood, by Mr. Herman Scholz, as well as the daintiness of his rendering of the little figures of boys in the medallions, merit the distinction of a bronze medal. In this bay a tray and set of tea-things, in a dark olive-green body, ornamented with applications of well-depicted forms in white paste (*pâte sur pâte*), exhibited by Messrs. Mintons, and designed and executed by M. Solon, we especially commend as worthy of a silver medal.

3. The decoration of the side of a room, exhibited by Messrs. Morant, Boyd, & Blanford, remarkable for the excellence and finish of the work, was based upon a scheme good in its proportions, and the blending of the delicate tones of colour adopted, with those of the damask panels, and the details of the ornamental forms used, redound to the good taste of the designer, Mr. V. Barnard. Messrs. Morant, Boyd, & Blanford also exhibit a satinwood cabinet, and we consider that Mr. H. Reich, who inlaid the frieze of interlacing garlands upon the front of the drawer and the central ornament of the flap, should be rewarded with a bronze medal.

4. Near bay No. 2 hung three red lustre plates, the work of Mr. W. de Morgan, to whom a silver medal should be given for suitability of design to the materials employed, as well as for the fine tones of colour and lustre obtained.

5. In Messrs. Jackson & Graham's cabinet and chimneypiece, of a so-called Oriental Greek character, extraordinarily delicate and perfectly fitting marquetry work, and very finished cabinet-makers' work, attracted attention. A bronze medal is due to Mr. A. Reich, the marquetry-worker, and a bronze medal to Mr. A. Baldwin, cabinet-maker; to Mr. Marchant, who is understood to have assisted in the cabinet work, we award one of the Society's certificates. Beneath the chimneypiece in rosewood, with plaques of inlay of ivory, ebony, and mother-o'-pearl, designed by Mr. Allwright, was a wrought-iron grate, of simple design, in good taste, made by Mr. Sayer, a member of the firm of Messrs. Feetham & Co., who exhibited other grates and fire-irons of good pattern and workmanship. A piece of embroidery, designed by Mrs. Alfred Morrison, who prescribed the colours and selected the materials used, greatly pleased us by the excellent distribution of Oriental motives, as well as the beautiful harmony in colour displayed in it.

6. The walnut seat for a vestibule, understood to be a copy of an old French design, reflects great credit in respect of its workmanship upon the exhibitors, Messrs. Gillow & Co. The carving, by Mr. M. Anderson, of the pendent heads of the canopy, and scrollwork on the arms of the seat, is well done. Carving in satinwood of garlands, on a small scale, but in high relief, and also of medallions, with a layer of satinwood upon a ground of ebony, in imitation of cameo-cutting, executed by Mr. Ross, to decorate the satinwood cabinet, made for the Empress of Russia by Messrs. Gillow, showed much skill in the execution, but in a direction of doubtful taste.

7. The carving of panels of boxwood let into a rosewood cabinet exhibited by Messrs. Holland & Sons was commendable.

8. In bay No. 6, some lightly-constructed furniture, including a stand in dark wood, after a Japanese model, and some chairs after good models of the Chippendale and Sheraton period, shown by Messrs. Howard & Co., was particularly noticeable for its gracefully designed and well-cut ornamental details. A rosewood chimneypiece showed good cabinet-maker's work. The designer of these pieces is Mr. Randal, whom we select for an award of a bronze medal, as well as for his design for a white metal fire-place and fittings. Some extraordinary specimens of glass cutting and engraving, by Mr. Northwood, who has produced a very remarkable *fac-simile* of the "Portland vase," probably unique as a work of glass-cutting of modern times; and a vase, called the "Milton vase," designed by Mr. Pargeter, of the Red House Glass Works, were exhibited by Mr. Pargeter. To the glass-engraver, Mr. Northwood, we award a silver medal.

9. Messrs. Wright & Mansfield contributed several excellent examples of inlaid work of the English eighteenth-century style, in the manner of Chippendale, Adam, and Sheraton, as well as work enamelled and decorated in the style of designs by Pergolesi. Awards of bronze medals were made to Mr. Thomas Hinton, the foreman workman, and to Mr. Victor Reich, the marquetry-worker, and of certificates to Messrs. Samuel Bryne, Charles Humphreys, and Thomas Miller, cabinet-makers, by whom the more important of these works were produced. The

carved and gilt mirror frames and girandoles in the style of the eighteenth-century English, and of Louis XV. French periods, especially three placed over the sideboard, were noted for superior workmanship, the carving being done by Mr. John R. Wingfield.

10. The modelling of the relief ornament carved by many hands, in a deep red mahogany mantelpiece and cabinet exhibited by Messrs. Collinson & Lock, was particularly good, and we award a silver medal to Mr. Webb, the modeller, for this and for many other specimens exhibited. His design for metal sconces was distinguished for richness in arrangement of conventional foliage, well grouped, and modelled with good effect of low relief and harmony in flowing lines. The metal-worker who wrought this design in brass is Mr. Singer, to whom we award a bronze medal. Of a different style, but of much excellence, the design being by Mr. Lock, the modelling by Mr. Webb, and the actual metal-work by Mr. G. Price, was a mirror frame of *repoussé* oxydised silver. We award a bronze medal to Mr. G. Price for his metal-working. The whole of the collection of furniture exhibited by Messrs. Collinson & Lock was noticeable for the completeness of workmanship throughout.

11. Some wrought iron by Mr. Sidney Phelps, of Sidney Sussex College, Cambridge, deserves mention, especially the panel for a balcony, which was of a good style of design, with interlacements of rod iron and beaten leaves of plate iron. The figures in the small panels, of deep modelled relief in terra-cotta, designed and executed by Mr. G. Tinworth, are full of expressive action, and we consider that a certificate should be awarded to this artist. We award a second certificate to Mr. G. Tinworth, the designer of the large flattened, circular bowl, executed in stoneware, and shown by Messrs. Doulton; and a certificate to Mr. Edward Sears, for his careful and clean painting in monochrome on two tiles, called respectively "A Saucy Companion" and "An Odd Chicken." We desire to commend the skill displayed in two delicately-carved birds in lime-wood, the work of Mr. W. Perry. Two panels of painted glass, suitable for the decoration of a house or hall, representing "Art" and "Science," appeared to us to show a right appreciation of the application of coloured design to glass, without detracting from its utility as a window through which light has to pass.

12. In bay No. 9, containing articles exhibited by Messrs. Gregory & Co., the reproduction of an old English arm-chair, enriched with carved and turned rails, and a little tea-table, were highly finished in workmanship, and commendable for the lightness of their construction. We award a bronze medal to Mr. W. P. Collins, the designer of these articles. To the designer, Mr. T. W. Hay, of the woven hanging, for the drawing and arrangement of details, as well as for good harmony of colour, we propose to award a certificate.

13. The well-proportioned framework or walnut panelling, for the dining-room or hall, shown by Messrs. Johnstone, Jeanes, & Co., in bay No. 11, was excellent in design, but, in our opinion, the effect would have been better if simple wood panelling instead of tapestry had been used. As it was, it produced the impression of an open screen which had been filled up, rather than of a wall.

14. The carving of the students of the School of Wood Carving, South Kensington Museum, was meritorious; and the pilaster executed by Miss Eleanor Rowe, of this school, showed good feeling for flow of line and the modelling of surfaces. It may be well to mention here that a principal aim of this school is to cultivate the production of wood-carving in a broad style, and at a cheap rate, similar to that used so largely for decorative purposes in the eighteenth century in this country. The works of this school are not, therefore, intended to compete with more expensive and more highly-finished wood-carvings.

15. We award a silver medal to Mr. R. Gleeson, for the suitable and graceful fan-mounts, which he has designed and executed, especially that of ivory, mounted with Mechlin lace. The inlaid amboyna-wood table, the work of Mr. Thomas Jacob, gained the distinction of a bronze medal, for the beauty of the marquetry work.

16. In concluding our report upon this Exhibition, we are of opinion that annual exhibitions, at which are shown various classes of fine art applied to industry, such as those represented at the present Exhibition, might be usefully supplemented were designers for all sorts of handicrafts and manufactures to be encouraged to submit drawings and sketches of designs which have actually been carried out. A section was allotted for such drawings at the Paris Exhibition of 1878; and, in our opinion, much useful instruction and information might be gained from such an annual display of designs to the benefit of producers and consumers.

George Godwin (F.R.S.).
Montague Guest (M.P.).
Edward J. Poynter (R.A.).
Alan S. Cole, Hon. Secretary.

August 5th, 1881.

The Viscount Hardinge wrote to express his regret at being prevented from attending the meeting.

LIST OF AWARDS.

Silver Medals.

M. Solon, for olive green tea-service, *pâte sur pâte*, (Messrs. Minton); Mr. de Morgan, lustre plates; Mr. Webb, modeller and designer (Messrs. Collinson & Lock); Mr. R. Gleeson, for carved fan mounts; Mr. Northwood, for glass cutting and engraving (Mr. Pargeter).

Bronze Medals.

Mr. H. Scholz, for painted furniture (Messrs. J. G. Crace & Son); Mr. Vernon Barnard, designer of side of room (Messrs. Morant, Boyd, & Blanford); Mr. J. R. Randal, furniture designs and design for fender (Messrs. Howard & Co.); Mr. Albert Reich, marquetry-worker (Messrs. Jackson & Graham); Mr. H. Reich, marquetry-worker of cabinet (Messrs. Morant, Boyd, & Blanford); Mr. William Allwright, designer of rosewood chimney-piece, inlaid with ivory, ebony, mother-of-pearl (Messrs. Jackson & Graham); Mr. Baldwin, cabinet-maker (Messrs. Jackson & Graham); Mr. T. Hinton, foreman cabinet-maker (Messrs. Wright & Mansfield); Mr. Victor Reich, marquetry worker (Messrs. Wright & Mansfield); Mr. Singer, for beaten brass-work (Messrs. Collinson & Lock); Mr. G. Price, for beaten oxydised silver frame (Messrs. Collinson & Lock); Mr. W. P. Collins, designs for furniture (Messrs. Gregory & Co.); Mr. T. Jacob, for marquetry top to table.

Certificates.

Mr. Marchant, cabinet-maker (Messrs. Jackson & Graham); Mr. C. Humphreys, cabinet-maker (Messrs. Wright & Mansfield); Mr. T. Miller, cabinet-maker (Messrs. Wright & Mansfield); Mr. S. Byrne, cabinet-maker (Messrs. Wright & Mansfield); Mr. M. Anderson, carver (Messrs. Gillows); Mr. T. W. Hay, designer of woven silken fabrics for room decoration (Messrs. Gregory & Co.); Mr. G. Tinworth, terra-cotta panels; Mr. G. Tinworth, designer and modeller of flattened round bowl, shown by Messrs. Doulton; Mr. Edward Sears, for painted tiles; Miss Eleanor-Rowe, for carved wood pilaster; Mr. W Perry, for carving in wood; Mr. Sidney Phelps, wrought-iron work; Mr. W. C. Codman, designer of panelling (Messrs. Johnstone & Jeanes).

IMPROVEMENT IN THE FIRING OF KILNS.

In no respect has the art of manufacture, in any of its main branches, made more advance during the present century than in what regards the economy of heat. Let any one glance back to the ancient modes of melting iron, of making steel, of burning lime! How rude and simple were the earliest procedures! To make a bonfire, and throw the ore or the limestone on it, or to bank up charcoal with mud to keep in the heat, were the first attempts at reduction. Small wonder that such was the case, when the very theory of combustion was unknown. It is but comparatively recently that manufacturers have become aware how much invisible fuel, as well as how much unused heat, was allowed to escape from the open mouth of the furnace. In our domestic consumption of coal, indeed, we keep to the good old plan (for the coal merchants) of sending some 70 or 80 per cent. of our heat and unburned carbon up the chimney. But in the processes of metallurgy, and in the production of steam, we have already effected very great economy, and not a year passes without some improvement in that path in which John Ericssen, in the construction of his caloric engine, was the pioneer.

A new application of the theory of the economy of heat has recently been made in one of those industries in which old wastefulness, and we may even say savagedom, have long maintained their ground. By no class of working men have improvements been more steadily and wrathfully resisted than by the brickmakers. The old brick-kiln was a mode of applying heat conspicuous for its simplicity, —not to use a harsher term. Mr. James Dunnachie, of the Glenboig Star Fire Brick Works, near Glasgow, has here been taking a leaf out of the valuable receipt book of Dr. C. W. Siemens, with signal success. His efforts have been directed at the same time to the use of gaseous fuel for burning his fire-bricks, and to the economising the heat produced by combustion. The first requisite was supplied to him by the "Wilson gas-producer," an invention which is closely connected with the Cleveland district. The construction of the new cellular kilns, we suppose, is due to the invention of Mr. Dunnachie himself.

The kiln is described as consisting of a series of ten separate chambers, all of the same size, and each having a capacity to hold 13,000 or 14,000 bricks. The chambers are arranged in two rows of five each, 24 ft. apart; the whole being covered by an iron roof. Gas and air flues are built under the chambers. The object of the arrangement is to draw successive charges of bricks, from chamber after chamber, utilising the heat that passes from one for raising the temperature of the next. Thus when the work of one chamber has been effected, and the bricks which it holds have been thoroughly burned, the current of gas from the gas producer is turned into the next chamber, and the atmospheric air requisite for combustion is made to pass through the first chamber, from which it extracts the heat no longer than required. The calorific power of the mixture of gas and heated air is intense, and the burning of each set of bricks is effected in from eighteen to twenty-four hours. It is expected that when the whole set of apparatus is brought into regular daily work a clamp of bricks will be thoroughly fired in twelve hours. In the best type of coal-fired brick-kiln hitherto constructed a firing takes from four to five twelve-hour shifts; that is to say, from forty-eight to sixty hours.

The economy in heat, if not quite equal to that in time, is said already to reach 50 per cent., as compared with coal firing, and is anticipated to reach fully 75 per cent. We can see no good reason for doubting the promise. A very perfect utilisation of heat is conceivable by means of these several chambers. The air passing from the bricks actually being fired at a very high temperature, raises the walls of the second chamber almost to a red heat, before the actual firing commences. The question of the regulation of blast, and of the serial heating of the chambers, is one of which the detail is susceptible of very great modification, as to which practice will, no doubt, be the best guide. But as it is the aim of the engineer to make the steam produced in the boiler part with all its heat in the form of mechanical power, and issue cool and damp to the external air when its work is done, so is it the object of the kiln-master first to heat the air to the temperature of flame, and then to rob this air of the whole of this imparted caloric, heating, in the rush of the great draught through the flues and chambers, first the walls of each cell, and then the contained charges, to such a degree as to reduce the firing specifically given to each charge to the minimum of the exact dose of heat required for the perfect firing of the bricks.

OUR NEW DOCKS.

We observe that Cardiff, which is a port of much larger trade than Swansea, is also on the alert for improvement. An application was made recently by the town authorities to the Marquis of Bute, the great land and coal owner of the locality, either to sell his dock to the Corporation, or to build a new one, and the Marquis announced his intention of doing the latter.

This great enlargement of our dock accommodation is a feature of no small importance as regards the industrial progress of England. It has a special and direct interest for the building trade. At Leith, at Liverpool, at Folkestone, at Swansea, at Milford, we have had to describe new harbour works. Cardiff, and London herself, are preparing fresh accommodation for their shipping. It may be said that the dock-builders have the courage of their hopes. Of all those great industries by the returns of which the movement of British wealth can be measured, —coal, iron, copper, lead, tin, zinc, textile industries, railway traffic, shipping,—it is the last alone that has maintained an unchecked increase, year by year, for the last ten years. Its vitality seems more independent of the general activity of production than that of any other occupation, which no doubt is due to the fact that shippers have two strings to their bow, and profit alike when the world demands the product of our looms, forges, and factories, and when we have to ask from the foreigners what we cannot produce at home. Since 1851, our gross tonnage has risen from 16,000,000 to 37,000,000 tons. But we can hardly expect so swift a march to be continuously maintained.

ROMAN ANTIQUITIES.

At a meeting of the St. Paul's Ecclesiological Society, held in the Chapter-house, St. Paul's Churchyard, on Tuesday evening, Major Heales in the chair, an interesting lecture upon the Roman antiquities discovered in Warwick-square, Newgate-street, was given by Mr. Alfred Tylor. The principal objects discovered (recently described by Mr. Tylor before the Society of Antiquaries) were exhibited, the most prominent being a leaden ossuarium and a glass cinerary urn found within it, and a very fine vase of serpentine, which, when found, contained a coin which dated from about 54 A.D. Mr. Tylor, in the course of his remarks, touched upon the relation of the Mithraic religion to Christianity, a subject suggested by various emblems found on some of the remains, and adverted to the excellence of the cast lead-work exhibited by the ossuarium. The exact positions in which the various objects were discovered, their depth from the surface, and the nature of the stratum in which they were found, were delineated on some very complete coloured drawings made by Mr. Tylor. In some interesting remarks he traced the principle of heredity in Christian and other symbols as seen in Roman sculptural remains, coins, &c., and subsequently he indicated the course of some of the principal Roman roads in Britain.

In the discussion which followed,

Mr. Milman, director of the Society of Antiquaries, observed that the objects discovered by Mr. Tylor were far superior to any that had yet been found in England. The fine serpentine urn was unique in this country, and almost unknown on the Continent. Mr. Franks, a great authority on such subjects, had expressed the desire that the objects found by Mr. Tylor should become a part of our national collection, and in that desire he heartily shared. The value of Mr. Tylor's discoveries was greatly enhanced by the extreme care with which he had recorded the exact positions of the various objects when found. In conclusion, Mr. Milman referred to the excavations about to be undertaken for the completion of the Inner Circle Railway by carrying it through what was a very interesting portion of Roman London, and said he was glad to learn that the attention of Mr. Price and other antiquaries who had made Roman London their study would be given to the progress of those excavations.

The Rev. Charles L. Acland, Hon. Curator of the Museum at Colchester, gave an epitome of Roman methods of interment, as illustrated by the contents of that museum, and urged that all who were connected with or interested in public or semi-public institutions such as museums should exercise watchfulness in localities where "finds" were likely to be made, in order to secure for public collections the objects found. Somehow or other, workmen who made these finds always knew exactly where to go in order to sell (generally for a mere trifle, such as the price of a pot of beer) objects of priceless value to the antiquary. Unfortunately for the public, there were people who would buy such things, and "ask no questions," and thus, no doubt, many specimens of great interest were kept hidden away in the hands of private persons, until it was forgotten whence they came, and perhaps they were ultimately lost, and so never reached a public museum, where they would be seen by those most competent to form an opinion upon and deduce lessons from them.

The Rev. Mr. Mayhew having offered a few observations, a vote of thanks was, on the motion of the Chairman, tendered to Mr. Tylor for his interesting lecture.

Ironworks and Collieries.—The prospectus is in circulation announcing the registration of Newton, Chambers, & Co., Limited, with a capital of 650,000*l.* in 20*l.* shares. This firm has existed nearly a century, and the reason for sale is that some of the numerous trustees on whom the properties and works have devolved on the successive deaths of the partners, have no power to continue the working beyond the approaching termination of the deed of partnership. The names of well-known and experienced noblemen and gentlemen appear on the board, and the terms of purchase are certified by competent engineers to be fair and reasonable, being based on the low prices at which they stood in the firm's books on the 31st December, 1880.

DOORWAY OF THE CHURCH AT WETZLAR.

We have frequently had occasion to call attention to the remarkably interesting church of Wetzlar on the Lahn, and we have noticed, in a previous number, the proof which the unfinished front of that church presents that Mediæval builders erected their buildings after the English manner, and not in the mode common at present on the Continent; that is to say, the details and ornamentation were worked before the stone was fixed *in situ*, instead of the stone being put up in block, and carved afterwards. It also proves that each separate feature of the building was finished off as it was erected, and not left to receive its finishing touches after the completion of the main edifice.

The doorway which we illustrate in our present number corroborates these facts in a very remarkable manner; for, although the walls of that part of the church are not carried up half their height, the whole of the ornamentation of the doorway is complete, and even the greater part of the statuary is fixed in its place. This consists of a beautiful figure of the Madonna attached to the centre pier, and those of the four Evangelists in the jambs. In the tympanum is a "Majesty," with statues of Mary and John the Baptist, and two angels offering incense. The lower part of the tympanum is ornamented by thirteen niches, probably intended to be occupied by statues. Looking through this doorway, which, by the bye, has never been supplied with doors, the lower portion of the more ancient west front is to be seen, with its very remarkable double portal, adorned with curious imitations of snakes or worms, carved in a black basaltic stone. The date of this front seems to be uncertain, though it is probably a work of the eleventh century.

The later doorway, like all the more modern portions of the church at Wetzlar, is constructed of fine red sandstone, which has resisted the weather excellently, and retained the sharpness of the sculpture in an extraordinary degree. We should like to ask some of our scientific readers how they account for the fact that the red sandstone of Germany retains its surface after many years of exposure to the air, whereas the English red sandstone, which seems to be of a similar formation, appears to have stood less well than any stone used by our Mediæval architects. The dampness of the climate would certainly not account for this, as the cathedral of Freiburg, in Breisgau, is remarkable for the wonderful state of preservation of its stonework, yet Freiburg is notorious as being one of the three places in Europe where the greatest amount of rain falls.

NORMAN DOORWAY, JEDBURGH.

We reproduce in our present number a drawing by Mr. G. H. M. Addison, of a late Norman doorway, from Jedburgh Abbey, a fine example of Transitional work. The ravages of time and weather have made sad havoc of the detail, leaving just enough to make us wish for more. During the revival of Gothic architecture, of which we are still reaping the benefit, all the periods received their due meed of attention except this, which may probably be attributed to the fact that it is essentially opposed to that economy in the stone-work so necessary in modern building. Perhaps no style is more suggestive to the designer in terra-cotta.

CASE FOR ORGAN: ST. MARTIN'S CHURCH, BRIGHTON.

This organ stands at a height of 18 ft. from the floor of the chancel. A recess, 15 ft. wide and 20 ft. high, is prepared to receive the frame, reservoirs, and heavier parts of the instrument, whilst the front shown in the drawing projects 6 ft. beyond the face of the wall. An effort has been made in designing the case to show the actual disposition of the various departments of the organ, and not to construct a mere screen of pipes and woodwork, having no relation to that which lies behind.

The "great organ," the diapason pipes of which show above the key-board to the right and left of the player, is divided into two parts, and projects to the full extent of the 6 ft. already referred to. This department is thus divided in order that the player may not be too much overshadowed by the projection, nor so much boxed in by solid woodwork as to be unable to hear what effect he is producing.

The carved panels which show between the pipes of the "great," and come immediately above the key-board, are kept back, and advance but little over the head of the player. The "swell organ" stands, at a little higher level, immediately behind the "great," and is hidden by the open panels already mentioned.

The "choir" organ projects, and forms the crowning feature of the design.

The "pedal" organ stands at the back of the recess, which is 10 ft. deep.

In building the church, preparation was made for placing the feeders and blower over the sacristy, and not in the recess with the organ itself. By this means the violent pumpings which so frequently occur are scarcely audible, and the danger from fire is lessened. The walls of the organ-chamber are constructed hollow, and a plastered ceiling stands above the instrument, only a portion of which is as yet erected. No part of the case is yet up, but the frame is prepared to receive it when funds permit. Messrs. Hill built the organ. Mr. Geo. Somers Clarke, jun., is the architect.

SCHLOSS BRÜHL, ON THE RHINE.

We present our readers this week with a view of the upper part of the principal staircase of Castle Brühl, a "cabinet piece of the Rococo style," that of Louis XIV. The ceiling especially is noticeable. Acting upon the impression that the slender Rococo ornamentation is not effective enough to divide the large horizontal space of the ceiling, and that a repetition of the frescoes in the three stories would be tedious under the treatment of that kind of painting, a gallery is formed at the summit of the walls, above which are introduced the final paintings at a height of about 14 ft. Powerful shades were thus produced. The castle was erected at the beginning of the last century, from the designs of French architects, for the Elector of Cologne. It is now the property of the German Emperor.

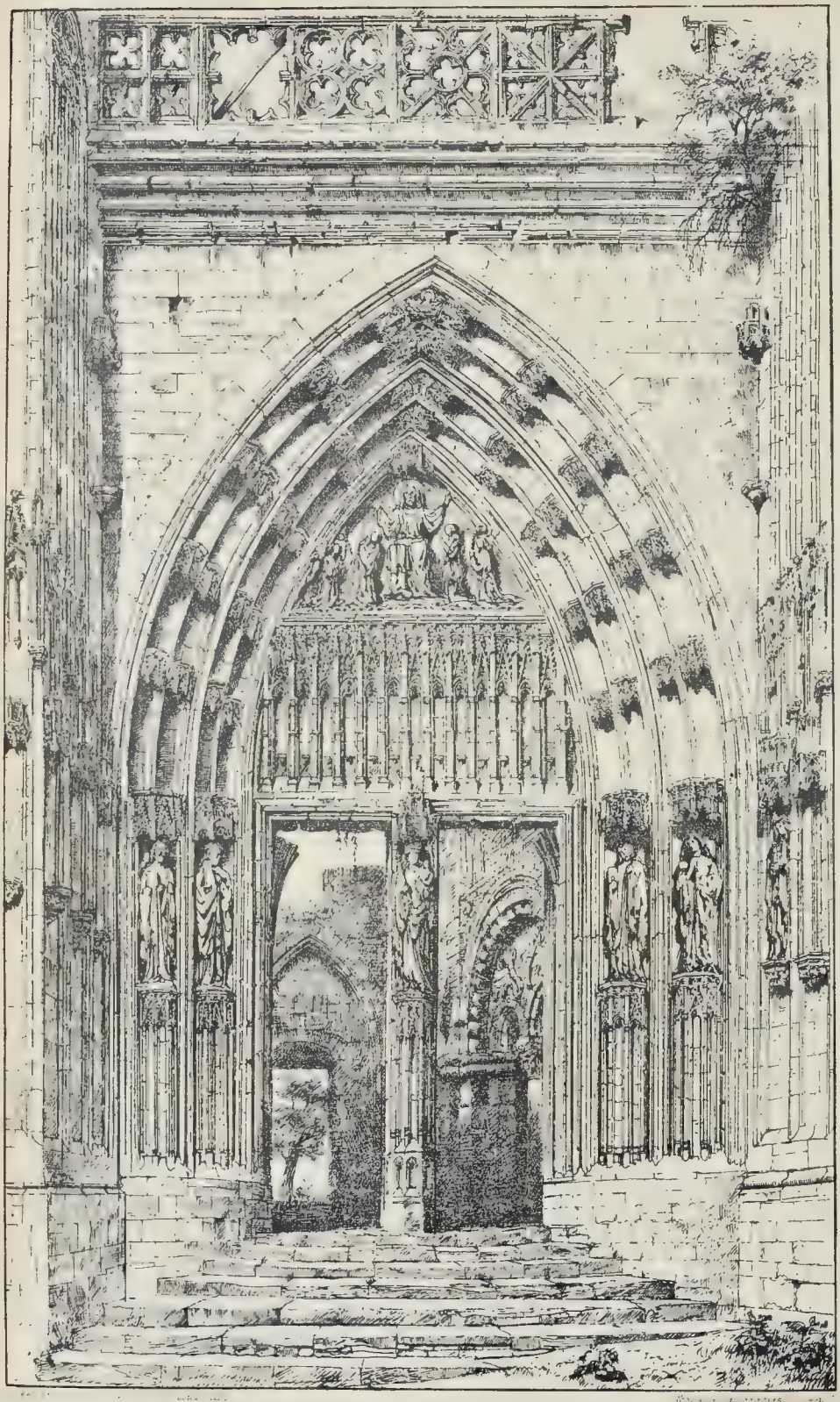
THE MANCHESTER AND LIVERPOOL DISTRICT BANK, SANDBACH.

This bank has been designed for an increasing population. The banking-room is entered by a commodious vestibule at the junction of High-town and Hope-street. A substantial angle-turret, the upper part of which is half-timbered, is the most prominent feature over the main entrance, the half-timber work being balanced by a pair of dormer gables on the front elevation. The main roof is hipped at each end, and covered with tiles. The architects were Messrs. Barker & Ellis, of Manchester, and the contractor was Mr. John Stringer, of Sandbach.

OFFICIAL INSPECTION OF HOUSES.

The Croydon Medical Officer of Health, Dr. Philpot, says in his last Report to the Local Board of Health:—"This arrangement of special inspections, which was instituted by your committee some few years ago, has worked very well. The number of householders who have applied for inspection of their houses shows how much the privilege is appreciated, and how many householders, alive to the dangers of defective houses, are glad to avail themselves of the assistance of the inspectors. Perhaps if it were more generally known that any occupier, by applying at the Sanitary Office, 8, Katherine-street, can have the sanitary arrangements of his house examined, without charge, by one of the Board's House Inspectors (who have now a very large experience), there would be still more applications. I have noticed that public companies have been formed for the purpose of inspecting houses, charging a fee for the examination. But it seems to me that the duty of house-inspection comes fairly within the duties of the public sanitary officers. One defective house may be a source of danger to the whole neighbourhood.

Station Roofs.—We understand that the walls of the Society of Engineers' meeting-hall in Westminster-chambers are covered with drawings of various recently-erected iron roofs in illustration of Mr. Arthur T. Walmisley's paper, which is to be discussed at their next meeting on November 7.



DOORWAY OF THE CHURCH AT WETZLAR ON THE LAHN.

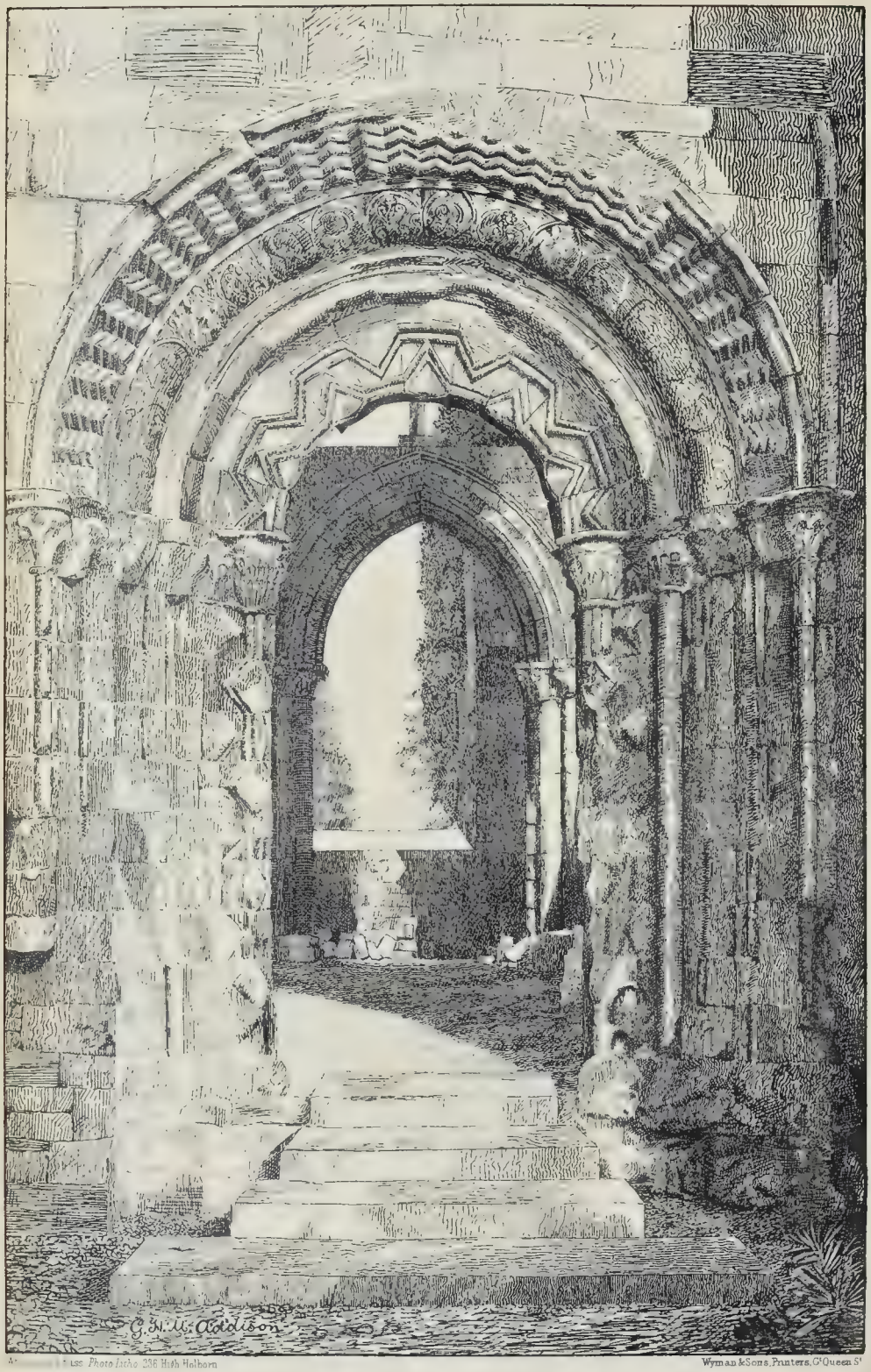


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NORMAN DOORWAY, JEDBURGH ABBEY.



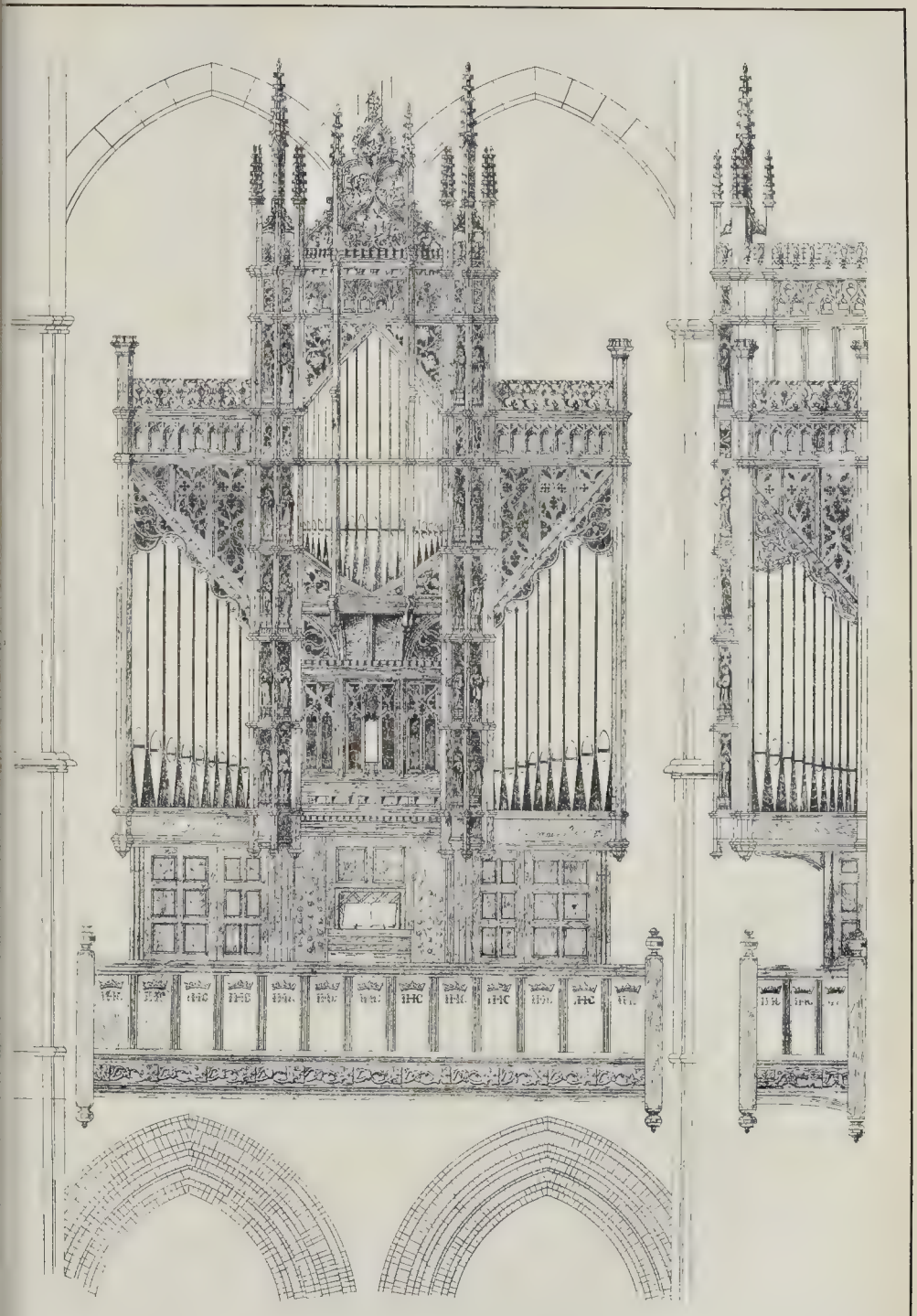


UPPER PART OF PRINCIPAL STAIRCASE, CASTLE OF BRÜHL, ON THE RHINE.



THE MANCHESTER AND LIVERPOOL DISTRICT BANK.—Messrs. Barker & Ellis, Architects.

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CASE FOR ORGAN, ST. MARTIN'S CHURCH, BRIGHTON.—Mr. George Somers Clarke, Jun., Architect.

INTERFERENCE WITH THE USE OF THE ELECTRIC LIGHT.

GLASGOW INSTITUTE OF ARCHITECTS.

At the fourteenth annual meeting of the Glasgow Institute, the President,

Mr. John Honeyman, F.R.I.B.A., in the course of his observations in moving the adoption of the report, said year by year new topics required their consideration. That which seemed to be more immediately pressing was the question brought formally before them by the Master Masons' Association regarding the measurement of mason-work, and there were other questions connected with contracting demanding attention. Moreover, there were questions of more general interest to the community on which they as a profession might be expected to express an opinion. At the present moment there was at least one subject of the kind which, he thought, should be taken into their most serious consideration without loss of time. He referred to the proposal of the Corporation to secure a monopoly of electric lighting in the city and suburbs. Unfortunately, at first sight this seemed a sensible proposal, and the great majority of men did not take the trouble to look at anything of the kind a second time unless almost forced to do so. In reality such a monopoly—like everything else bad in principle—would be found pregnant with most pernicious consequences. It should not be necessary to point out to a constituency which boasts of its Liberal principles, and its abhorrence of Protection in any shape, that the principle of a monopoly is bad; and yet it would seem that the citizens of Glasgow were prepared quietly to acquiesce, without one word of remonstrance, in the creation of a monopoly of the very worst description—obstructing the practical application of scientific discovery, and prohibiting the use—for that was really what it would amount to—of an invention of the greatest utility; the general introduction of which would benefit the public health more than the most costly sanitary scheme which had been suggested. The excuse, of course, was that the gas monopoly must be protected. But where was this new departure of their Town Council to end? If they made the gas bad enough they might find it as necessary to secure a monopoly of paraffin oil and put a shilling or two on the gallon. The thing was almost too absurd for serious argument. If we made a bad bargain of the gasworks we must bear the consequences, and our experience in connexion therewith should at least teach this, that science was not like a distinguished living statesman—she gives no rash pledges of finality. The electric light was the light of the immediate future, but who could tell what might be next, and next? and it would indeed need a very strong case to be made out,—a very urgent necessity, in short,—to justify the creation of an obstructive monopoly, in defiance of every sound principle of political economy. It would be out of place to say more on the subject now. With the view of quickening their interest in it, he would venture to give one illustration of how injuriously the proposal might affect their clients,—in other words, their fellow citizens. In a large block of buildings containing shops and counting-houses he purposed having a continuous elevator, worked by a small steam-engine, which should have sufficient surplus power to supply all the tenants with electric light. It was quite evident that the cost of the daily supply of light would be a mere trifle,—the engine and attendant being required, at any rate; and if it were supplied to the tenants gratis, much more than an equivalent would be obtained by increased rents and constantly occupied premises. Now, the question really came to be,—Is such an arrangement to be prohibited, because, forsooth, the Gas Committee must get 50*l.* of profit out of that property? Let them, he said, get their 50*l.* by all means; no one wished to repudiate their responsibility, but what he wished to point out was that the man who improved the annual value of his property by the free use of electric lighting, to the extent of say 300*l.* a year, even if he paid that 50*l.*, was a gainer by his freedom to the extent of 250*l.* Now, what the committee wished to do in order to secure this 50*l.* was to prohibit the intended economical production of electricity, and so, in effect, confiscate the 250*l.*; not to supply electric light at all for years,—as even the words of our progressive Lord Provost seemed to indicate; and when they did vouchsafe to allow it, the tenants would be left to the tender mercies of the Gas Committee, and most of them knew something of these. The supply would be connected with the house, not as the proprietor or the tenant wanted, but when, where, and how the officials of the Gas Office thought proper, who, after probably making a thorough mess of good walls and ceilings, would charge whatever they thought proper for their trouble. And lastly, they would charge whatever they chose for the supply of electricity, and interfere with the use of apparatus which the user might prefer, allowing no choice of accumulators, lamps, or anything else. Knowing, as they did, how such things affected property, he felt strongly that a certain responsibility rested upon them in the matter, and that it deserved their most earnest and immediate attention.

A meeting of the newly-elected Council (Glasgow Institute), took place immediately after the general meeting, Mr. John Honeyman was re-elected president; Mr. James Sellars, jun., vice-president; Mr. John Burnet, 167, St. Vincent-street, auditor; Mr. William Landless, treasurer; Mr. William M'Lean (of William & C. J. M'Lean), writer, 196, St. Vincent-street, secretary.

A NEW COUNCIL CHAMBER AT GUILDHALL.

At the meeting of the Court of Common Council, on the 20th inst., Mr. Fricker (chairman of the Special Guildhall Improvement Committee) brought up the report of that committee on the reference of March 31st, 1881, to consider the whole question of a scheme for the complete arrangement and improvement of the courts and offices in and around Guildhall. He said that the present chamber was utterly inadequate. There was accommodation for something like 130 or 140 members, whereas the number on the list was something over 200, and they were often inconveniently crowded, and had to breathe a very impure atmosphere. On March the 31st a reference was made to his committee to consider a scheme for the complete re-arrangement and improvement of the courts and offices around Guildhall. The committee did not at the present moment desire to recommend the Court to carry out any very extensive improvements; indeed, they refrained from expressing an opinion as to what sum of money might be afterwards required for carrying out that which was foreshadowed on the skeleton plan, and turned their attention to the construction of a new Council-chamber. What they recommended was simply the erection of a new Council-chamber on the north side of Guildhall, to occupy the position now occupied by the Court of Exchequer, the Chamberlain's office, the Town Clerk's office, and the Architect's office. The diameter of the chamber would be 54 ft., surrounded by a corridor 9 ft. wide, by means of which ready access would be obtained to every part of the chamber, and great facilities afforded for warming and ventilating the interior. The Lord Mayor and aldermen would, according to this design, enter the court from the dais at the eastern end of the Guildhall through an anteroom, the commoners' entrance being from the existing corridor. Sitting accommodation for all the commoners (206 in number) would be provided, the seats being arranged concentrically to the Lord Mayor's chair, and on a rising stage. Each member would have his own definite seat, as is now the case in the aldermen's court-room. Seats for twenty-five aldermen and the Recorder would be provided on a raised bench on either side of the Lord Mayor's chair; and for the principal officers, below and in front of the Lord Mayor. There would be a gallery round this chamber to accommodate about 300 of the public, and over the Lord Mayor's chair there would be a reporters' gallery. In the centre of the chamber would be a table for the exhibition of plans, papers, models, &c., and immediately opposite the Lord Mayor would be the City Seal and the Bar, as at present, with considerable additional space for petitioners. Adequate provision would also be made for taking divisions, the respective tellers being situated at a distinct point in either corridor, the members passing out right and left into the corridor, returning by the bar of the Court. As regarded the dimensions of the building, the external diameter would be 78 ft.; internal diameter, within screen, 54 ft.; the corridor, 9 ft. wide; internal height from floor to dome, 61 ft. 6 in.; internal height to top of lantern, 81 ft. 6 in.; and the external height to the vane would be 100 ft. The replies of the Architect as to the question of ventilation, which had had their serious attention, were entirely satisfactory. The Architect told them that the building, without the fittings, but including the permanent offices for the Town Clerk, which would be beneath the floor of the chamber, but level with the pavement in Basinghall-street, would be about 35,000*l.* If they fitted up the chamber with furniture and fittings of the same quality and description as in the library, the cost would be something under 2,000*l.* In order to carry out this plan they must remove some of the present offices, and provide temporary accommodation for the officers while the building was being constructed. The Architect estimated the cost of such temporary accommodation at about 1,200*l.* He moved that the Court agree with the committee in their report, and that it be referred back for execution.

The motion was carried amidst loud applause, and it was referred to the Coal, Corn, and Finance Committee to provide the necessary means for carrying out the work.

THE NEW DOCK AT SWANSEA.

The new east, or "Prince of Wales," dock at Swansea, opened by H.R.H. last week, is constructed in what was formerly known as Fabian's Bay, a large expanse of soft mud and shingle inside the harbour mouth, through which ran a channel, communicating with the ancient shipping place called Port Tennant. There was at first a good deal of controversy as to the advisability of doing away with so good a refuge for ships running into harbour before the wind as the soft bottom of Fabian's Bay, but that was overruled, and, by the Swansea Harbour Act, 1874, the construction of the present dock was sanctioned. The estimated cost was then 300,000*l.*, but that has since been reduced by leaving parts of the work, such as the walling and locking of the half-tide basin, temporarily incomplete. The area of water enclosed in the East Dock is 23 acres, which gives a length of 2,320 ft., a breadth varying from 500 ft. to 340 ft. and a depth of 36 ft. There is a slight difference of 2 ft. between the depth, from coping to bottom, on the north and south sides, because of the requirements of the coal drops. The outer cill of the lock will have on it 32 ft. of water in ordinary spring tides. This is one yard deeper than was originally contemplated, but the Harbour Trustees thought it necessary in order to provide for the ever-increasing size and draught of water of the class of steamers which now almost monopolise the carrying trade, and also in view of the further deepening of the entrance-channel by dredging. The inner sill of the lock will have a water depth of 27 ft. at ordinary spring tides. The length of the quay walls round the dock is about a mile. It was first intended to make a half-tide basin with entrance-gates in the usual way, but with a view of saving present outlay, and as the engineer (Mr. Abernethy) reported it would be no less efficient, it was decided that the basin should be for the present a tidal one. Its water area is 4½ acres, length 400 ft., breadth 400 ft., length of quay walls 1,000 ft. The lock is no less than 500 ft. long by 60 ft. wide, and has all the latest appliances. In this respect Mr. Abernethy has planned several modifications since he constructed the Alexandra Dock at Newport. The length of the lock quay wall from the dock to the tidal basin is 622 ft. Near the south-eastern corner of the new dock, or rather nearer to the lock than to the corner, has been prepared the entrance to a large graving-dock, 500 ft. long, which will be hereafter excavated.

By way of securing tranquil water just outside the tidal habour, and with a special view to prevent the prognosticated difficulties of entering when south-west gales are blowing, a fine horn or pier has been constructed of solid concrete, which projects 500 ft. into the sea, and will presently be backed and supported by a triangular stretch of earth-work, running backwards from the outer point to the adjacent copper works.

The total amount of excavation effected at the new dock is no less than 1,200,000 cubic yards. The work of excavation has been mainly done, and of course vastly accelerated, by the employment of powerful machinery and appliances. No less than fifty engines have been in use at one and the same time,—namely, five steam navvies or "devils," fourteen locomotives, twenty steam cranes, and eleven portable engines for

various other purposes, such as working winding gear, mortar-mills, &c. The masonry is chiefly of local Pennant sandstone, worked at the contractors' own quarries at Red Jacket; at Messrs. Thomas, Watkins, & Jenkins's Townhill Quarries, or elsewhere in the immediate district. No less than 40,000 cubic feet of granite blocks have been brought from the Penryn Quarries to form the coping stones, quoins, &c., and some portion of the lock. The bottom of the lock is lined with bricks, of which the round number of 500,000 has been supplied by the Mill Lands Brick and Tile Company, Neath.

The works have been kept dry by a pair of Cornish pumps, erected near the seaward entrance, and capable of lifting 1,600 gallons per minute. There are six lock-gates, each leaf of which weighs 70 tons. They have been built on the spot, of greenheart timber from Demerara, and pitch pine from America.

The new harbour railways, including seven miles of siding accommodation, with junctions with the adjacent Great Western Railway and Midland Railway lines, are progressing towards completion. The rails, which are wholly new and of steel, are supplied by the Dowlais Steel Company, and all the sleepers are well pickled. The whole of the coal-drops, capstans, gates, sluices, and other machinery in connexion with the dock will be worked by hydraulic power, the central point of which lies near the south-eastern corner, where a fine engine-house is constructed. This is being fitted with six great boilers and two engines, from the Elswick works of Sir Wm. G. Armstrong & Co.

None of the coal-drops are yet completed. There is space for the erection of five drops or tips on the Great Western Railway Company's wharfs, and three on the Midland Company's wharfs. All the foundations, &c., are ready, and most of the metal-work and other machinery is on the spot, but time has not allowed of their erection before the royal visit. The distinctive difference between the drops at the new and previous docks will be this, that at the New Dock the loaded trucks of coal will come down along the level railway to the tip, whence they will be lifted on the hydraulic platform to the height of the shoot, and, after being emptied, they will pass away over the high level. This exactly reverses the operation now in vogue at other docks in Swansea, where the full trucks occupy the high and the empties the low level lines. Under the new system, when the empty truck is discharged from the hydraulic lift on to the high level line, it will pass away by its own gravitation down a gentle incline, and thus save a great deal of labour.

The channel embankment, extending from the new cut to the east pier, is not walled, but sloped to the extent of 3 in 1, and faced with "slag" from the copper works. Around the dock, especially to the north and west, there is ample room for high and low level railways, drops, warehouses, sidings, &c.

As a backwater, the new dock has the waters of the Tennant Canal, which connects Swansea and Neath and other places by a thoroughly efficient system of water carriage. To the eastward of the dock, and extending for miles as far as the river Neath, there is a great deal of level uncultivated land, known as "the Bog," which affords ample space for the deposit of ballast and the erection of works, &c.

The consulting engineer of the Harbour Trust in the creation of this, as of the previous docks of Swansea, is Mr. Jas. Abernethy, President of the Institution of Civil Engineers. The work of carrying out his plans has been performed by Mr. A. J. Schenk, the resident engineer, Harbour Office. The contractor is Mr. Thomas Andrew Walker, of Cannon-street, London, whose resident general manager has been Mr. W. R. Parker, who has had for assistants Mr. Clifford and Mr. Conolly.

For the docks pure and simple, the contract price was originally 197,000*l.*, but was subsequently increased by 8,000*l.*

The *Cambrian* of the 21st inst. (to which journal we have been indebted in giving the foregoing account) contains some interesting details of the other docks of the port, of which Messrs. George & James Abernethy were the engineers. Telford reported upon the improvement of the harbour in 1827.

Beverley Waterworks.—These works are now fairly commenced. The first sod of the reservoir was lately turned by Mr. J. R. Pease, the Company's chairman. Mr. J. F. Fairbank, of Westminster, is the Company's engineer.

THE FISH-MARKET QUESTION.

Since our article of the 8th inst. on this subject was written, several other proposals besides those enumerated by us have been made. The three principal ones are the suggested acquisition of a large site in the Blackfriars-road (referred to in Mr. Leeuw's letter in our last, p. 530); the scheme propounded by Mr. W. J. Glenny, of King's College, in conjunction with Mr. A. T. Walmisley, C.E., for the extension of Billingsgate Market; and the scheme for a central market put forward by Messrs. Cayley and Boyes, in conjunction with Mr. H. H. Bridgman, architect.

The scheme propounded by Messrs. Glenny and Walmisley suggests the provision of a retail fish and fruit market, extending from London Bridge to the existing market at Billingsgate. It is proposed to widen Thames-street and to re-construct the whole of the existing warehouses and wharfs on the south side between London Bridge and Billingsgate, and to increase the height of them until the present rental is not only attained, but exceeded. The existing market covers about 31,350 square feet. The proposed re-construction, according to this scheme, would provide (its propounders say) an additional market of 72,710 square feet area, besides an increase of 1,000 square feet to the existing market, 7,200 square feet to the landing-stage, and 4,455 square feet to Thames-street. The retail and public entrance would be on the level of London Bridge. There would be continuous steam lifts for passengers, and hydraulic lifts and steam cranes for fish. In the additional width to Thames-street space would be gained to provide for sufficient cranes and lifts with convenient tramways to unload as many wagons as could occupy the space and convey the fish to auction stations on both levels if necessary. The expense of new approaches would thus, it is claimed, be saved, while ten times the quantity of fish could be unloaded in a given time.

The scheme with which Mr. Bridgman's name is associated is a bold one. It proposes the erection of a large market of two floors, 225 ft. wide and 940 ft. long, on the mud bank which covers the foreshore of the Thames on the Surrey side between Waterloo and Charing-cross Railway bridges. The superstructure would be supported on iron girders carried by three rows (running longitudinally) of iron columns resting on caisson foundations, the columns in the front row being 100 ft. apart. The whole of the columns would pass up through and support the sub-floor, and would, of course, also carry the girders of the principal floor, which latter would be covered in by an iron roof of one span, somewhat similar to that over the St. Pancras terminus of the Midland Railway. The principal floor of the market would be on the level of the roadway of Waterloo Bridge, and would have an area of 191,250 square feet, or 4⅜ acres. The east end of this floor would be approached from Waterloo Bridge. There would be a sub-floor at a level of about 25 ft. below this principal floor, and about 25 ft. above high-water mark,—thus permitting barges, &c., to pass underneath,—and this sub-floor would afford more than four acres of space available as standing room for fishmongers' carts and other vehicles. The proposed structure would project from the Surrey shore as far as the second pier of Waterloo Bridge, the frontage following the curve of the river. On the river frontage, on the level of the principal floor, would be a terrace walk, 25 ft. wide, supported by cantilevers, on to which terrace a long row of retail shops would open. The back elevation of the proposed market would be distant from the wharfs and business premises at present existing on the Surrey shore 60 ft. at one end and 100 ft. at the other end. With respect to the intervening space, which is now mud during about ten hours of the day, it is proposed to convert it into a deep-water dock or channel so as to allow barges to pass to or from the wharfs at any state of the tide. The immediate proximity of the proposed market to the Charing Cross branch of the South-Eastern Railway, which is on a level with the principal floor of the market, would allow of one or two short junction lines being made to run right into the market; and as the South-Eastern line is readily accessible from all the fish-carrying lines, fish by the train-load could be run into the proposed market, the plan of the principal floor showing four lines of rails running its whole length, with standing room for three lines of carts and vehicles between (in addition to a larger standing space in the centre of the market), so that the fish could be sold direct from the railway trucks and carted away at once by the purchasers. Provision could also be made for the landing of water-borne fish. At the west end, the proposed market could be approached by foot-passengers direct from the footway (which would be widened) of the Charing Cross Railway Bridge. Access for vehicles passing to and from the principal floor and sub-floor of the market is provided by an inclined roadway (with gradients of 1 in 18 and 1 in 20) from Belvedere-road. The chief access for vehicles to the principal floor of the market will be by two gateways opening on to a space between the east end of the market and Waterloo Bridge. These are the leading points of the scheme, which, as it appears to meet many requirements desiderated by those who have given evidence on the subject before a Committee of the Corporation, will no doubt receive due consideration. However pressing may be the necessities of the case, and whatever action may be taken by the Thames Conservators and other bodies with regard to the scheme, we must confess that the prospect of another enormous roof planted broadside on to, and some distance into, the river, is not likely to be agreeable to those who would not sacrifice everything to utility.

THE BISHOP'S DOWN GROVE SPA, TUNBRIDGE WELLS.

A number of gentlemen visited the picturesque and historicallly interesting locality, Tunbridge Wells, on Tuesday last, with the view of inspecting the additions and improvements that have been made at the Bishops' Down Hydropathic Sanatorium, and which render it a very complete establishment of its kind.

The first additions consisted of a handsome Turkish bath, comprising a spacious cooling-room, three hot-rooms, shampooing-room, all heated and ventilated on approved principles; a steam-laundry, engine-room, and boiler-house. These completed, the old mansion was stripped of its high-pitched tile roof, the walls were strengthened, and two stories of bedrooms raised thereon, and a large block of buildings was erected to the east of the old house. These latter contain a spacious dining-hall, 60 ft. by 35 ft., and 13 ft. high; a drawing-room 65 ft. by 33 ft., and of a similar height; and a recreation-room 48 ft. by 27 ft., having a well-arranged permanent theatre therein for amateur performances. There are two stories of bedrooms over the two large rooms, and the new kitchen is situated over one end, the dining-hall occupying the height of the two lower stories.

A wide and handsome corridor paved with encaustic tiles forms the old mansion or central block, as also leading from the grounds. All the corridors and passages are warmed by hot water at low pressure, as also the large rooms, the latter having, in addition, the ordinary open fireplaces. The kitchen offices have been fitted up with every modern appliance, so that the preparation and service of a dinner for 150 or 200 persons is a work of comparative ease. The additions have been carried out from the designs and under the superintendence of Mr. Benjamin Tabberer, architect, of Coleman-street, London. Messrs. Willicombe & Oakley, of Tunbridge, are the general contractors. Messrs. Benham & Sons, Wigmore-street, have executed the kitchen fittings; and Messrs. Weeks & Co., of Chelsea, the heating apparatus, introducing their Patent Caloric Batteries in the large rooms. The lifts are by Messrs. Waygood & Co., and the encaustic tile paving is by Messrs. England & Sons. The furniture has been provided by Messrs. Gillows, of Oxford-street, London, and both in design and solidity well sustains the reputation of that eminent firm.

The system of baths connected with the establishment is of a very complete character, and embraces all the latest appliances in hydro-therapeutics, including the electric baths, &c.

The proprietary have adopted the albo-carbon light for the illumination of the new *salle-à-manger*, the drawing-room, and the theatre or recreation-hall. In this system of lighting (which is at least remarkable for its simplicity) ordinary gas is employed, but prior to ignition is passed through ornamental vessels containing the albo-carbon material, the vapour from which so copiously reinforces the gas with carbon as to treble, if not quadruple, its illuminating power, and also renders the flames (which would

otherwise be yellowish and wavering) intensely bright and steady. One great advantage of this process is that the jets of gas in use are considerably reduced in number, with a proportionate decrease of heat.

The Albo-Carbon Light Company may be congratulated on having secured, through the enterprise of Mr. Dick and Mr. Young, and the taste of the architect (who supplied the designs), an excellent opportunity for illustrating the effects of their system.

The amount expended is said to be about 15,000*l.*

As a winter residence, the Bishops' Down Grove Spa offers many attractions to the invalid and to those who are desirous of breathing a purer air than is afforded by London and its immediate neighbourhood during the prevalence of the smoky fogs which envelope the metropolis for so large a portion of the year.

QUESTIONABLE ROAD-MAKING IN HACKNEY.

Some grave statements were made at a meeting of the Hackney Vestry last week, relating to the construction of Cazenove-road, Stamford-hill, which is at present in progress. Mr. W. J. Walker, one of the members, drawing attention to the subject, said that the manner in which the road was being constructed was a disgrace to the locality. He condemned the material which the contractor was using, stating that it consisted of the most offensive and deleterious stuff that could be conceived, and that the ratepayers' money was being wasted. He moved that in the opinion of the Vestry the present condition of the road, after having been six months in the hands of the contractor, and presumably under the superintendence of the surveyor, called for a searching inquiry into the present system of road-making in the parish. Mr. Butler, in seconding the motion, said the materials included pieces of old iron, old shoes, meat-tins, and other similar objectionable refuse, which had worked themselves up to the surface through the pressure of the traffic displacing the large boulders. The motion was ultimately adopted.

OPENING OF THE JOHNSON HOSPITAL, SPALDING.

Many of our readers will remember that in March, 1879, over sixty sets of competitive designs were received by the trustees, when the one selected was that of Mr. G. G. Hoskins, F.R.I.B.A., of Darlington (who has been successful in other hospital works already mentioned in our columns), shortly after which the work was placed in the hands of Mr. James Bulling, of Ollerton, near Newark, and has been carried out under the supervision of Mr. Wallis, clerk of the works.

On the 12th inst. the hospital was formally opened by the Bishop of Lincoln.

The aim of the architect has been, so far as externals are concerned, to present a building which, whilst in material construction corresponding with St. Peter's Church, to which it is adjacent, should at the same time bear upon the face of it evidence of its own all-important purpose; and, as to the interior, airiness, thorough ventilation, convenient ingress and egress, good lighting, and a favourable arrangement of aspects, have all been carefully studied and effected with the greatest possible success. The bricks used are of the same character and quality as those employed in St. Peter's Church; the eaves cornice, and other work of a like description, are formed of purpose-made bricks; the sills, copings, and other dressings are of Ancaster stone, and the entrance steps of Park Spring stone. All the external walls are hollow. The front of the building faces to the eastward, and on passing into the main entrance the first room that presents itself to one's right on the ground-floor is the operating-room, which is a one-story building, measuring 20 ft. by 16 ft. 9 in., and provided with ceiling-light and all the necessary convenience for surgical operations. Next in order in the front of the building is the surgeon's sitting-room (17 ft. 6 in. by 15 ft. 9 in.), from which only the main corridor has to be crossed in order to reach the consulting-room (16 ft. by 15 ft. 9 in.), and adjoining which is the surgery (16 ft. by 14 ft. 6 in.). Next in order come the dispensary and its attendant offices, all of which are so arranged as to afford the greatest possible comfort and the least possible inconvenience to those who may need the benefits of this department. The dispensary waiting-room is at the extreme north of the building, measures 24 ft. 6 in. by 19 ft. 6 in., and is fitted up with all the offices essential to a well-constructed dwelling, whilst to reach the dispensing-room (16 ft. by 13 ft. 6 in.), procure the requisite medicines, and pass out, the patients need but to pass along the main corridor, delay a moment at a hatchway provided for the purpose, and then make their exit by a door in the east wall. Ascending the main staircase, we find that all the wards are arranged on the first floor, occupying the extreme north and south respectively. Provision is made for twenty patients,—ten males and ten females,—the former being destined to occupy the north and the latter the south wards. The larger wards, which will accommodate eight patients each, are within convenient reach of two smaller wards, which will accommodate two patients each. Adjoining all the wards are the nurses' rooms. They are furnished with windows looking into both the larger and smaller wards, as also are the nurses' sculleries. The internal face of the walls of all the wards is finished in Parian cement; whilst the carpenters' and joiners' work throughout the building is of pitch pine, selected and varnished. Speaking-tubes are conveniently arranged to connect the various departments.

BATHS AND WASH-HOUSES FOR BETHNAL GREEN.

There is every prospect of Bethnal Green being shortly supplied with public baths and wash-houses. A special meeting of the Vestry was held last week to take into consideration the propriety of putting into force the Public Baths and Wash-houses Act. Mr. Jones, in moving a resolution in favour of establishing the baths, observed that the Act had been adopted in several parts of the metropolis, and in the majority of instances its effects had been of the most satisfactory character. In Whitechapel large numbers of the residents did their laundry work on the premises, the conveniences afforded being much appreciated. The Paddington baths cost 50,000*l.*, and notwithstanding this large outlay they had proved to be a paying concern. Bethnal Green had a toiling population, to whom a bath would be an appreciable luxury, but it was denied the people because there were none to be had, or otherwise they were in the hands of private persons who imposed almost prohibitory charges. The motion was referred to the consideration of a special committee.

A NEW STATION ON THE CRYSTAL PALACE RAILWAY.

For some time past building has been going forward on a large scale in the neighbourhood of Busby-hill and Grove-park, Camberwell, some hundreds of houses having been erected in the locality within the last year or two. The residents in the district having represented to the London, Chatham, and Dover Railway Company that the two nearest stations,—Denmark-hill and Peckham-rye,—are both at a considerable distance and equally inconvenient, we understand that the company have determined upon the erection of a new station which will shortly be proceeded with. It is said that the new station will be placed about midway between the Denmark-hill and Peckham-rye stations, which will accommodate the large population which has recently sprung up in the locality.

PROPOSED NEW BUILDING ACT FOR THE METROPOLIS.

At the meeting of the Metropolitan Board of Works on the 21st inst., the Building Act Committee reported that, in their opinion, it is desirable that fresh legislation should be sought with relation to various matters appertaining to buildings and streets in the metropolis, and they recommended that the matter be referred back to them, to settle the details of the proposed measure, and that a reference be made to the Parliamentary Committee to give such notices and to take such steps as may be necessary to obtain legislation during the ensuing session of Parliament.

The recommendation was agreed to without discussion.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,367. S. E. Simpson, Birmingham. Dwelling-houses, &c. Oct. 7, 1881.

4,376. J. Carter, Uxbridge. Constructing and glazing roofs, &c. Oct. 8, 1881.

4,391. B. W. Spittle, Wednesbury. Attaching door-knobs to their spindles. Oct. 10, 1881.

4,423. W. A. Barlow, London. Slates. (Com by T. Finger, Coblenz, Germany.) Oct. 11 1881.

4,425. T. Stokoe, Headingley. Apparatus for heating rooms, greenhouses, &c. Oct. 11, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

October 11, 1881.

2,539. M. Delmard, Plumstead. Chimney-top or cowl and ventilator. June 10, 1881.

2,686. A. Damman & A. Cassard, Brussels. Parquet flooring. June 20, 1881.

3,708. A. C. MacLeod, Shrewsbury. Floors or surfaces for skating upon. Aug. 25, 1881.

4,297. B. D. Healey, Brighouse. Asphalte apparatus. Oct. 4, 1881.

October 14, 1881.

2,561. C. H. Pennycook, Glasgow, Bars for holding glass for window and roof lights, &c. June 13, 1881.

2,629. G. A. Wright, Portsmouth. Materials for forming blocks for buildings, &c. June 16, 1881.

2,786. T. Carder, Chudleigh. Kilns. June 25, 1881.

3,839. C. D. Abel, London. Firegrates for burning dense fuel. (Com. by A. Godillot, Paris.) Sept. 3, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending October 15, 1881.

954. J. Taylor, Clapham. Paving-blocks for roadways, &c.

A piece of metal is driven into the upper part of the end of the wooden block, and may either be level with the upper surface of the block or raised a little above it, to give a foothold for horses, &c. March 5th, 1881. Price 6d.

1,025. J. Peer, Salford. Furnaces, fire-grates, &c.

Bars of an I shape are used, which, when placed together, form passages for air, which is afterwards admitted into the fire through the fire-clay back, and thereby the smoke is consumed. (*Pro. Pro.*) March 10, 1881. Price 2d.

1,026. S. Rideall, Manchester. Construction of buildings, &c.

In the construction of wooden buildings, planks are used for the covering thereof with grooves a short distance from each edge and on one side of the plank. These planks are laid a distance apart, grooves uppermost, and other planks are laid over them, grooves downwards, with the outer edges of the grooves resting in the grooves of the lower planks. (*Pro. Pro.*) March 10, 1881. Price 2d.

1,038. W. R. Lake, London. Water-closet apparatus, &c.

This is an improvement on Patent No. 4,037 of 1879, in preventing the escape of noxious gases and effluvia, and effects to this object by a variety of improvements in details, which are stated in fourteen claims. (Com. by A. Edwards, Philadelphia, U.S.A.) March 10, 1881. Price 8d.

1,044. R. Douglass and J. Douglass, Coventry. Apparatus for the cure of smoking chimneys.

A box is fitted to the fireplace, the front of which is a sliding plate, in which plate are whirligig ventilators. The box is placed a little above the fire, and as the current of air enters the chimney it is whirled round by the vanes of the wheels, and meets and overcomes any down-draught. March 11, 1881. Price 6d.

1,047. C. S. Rolfe, Westminster. Appliances for preventing the efflux of gases from drains, &c.

This consists of various forms of traps. (*Pro. Pro.*) March 11, 1881. Price 4d.

1,051. F. Arnold, Birmingham. Hydro-carbon cooking and heating stoves.

In place of a single wick case, two or more are used, so far separated as to allow an adequate supply of air to reach the flames. A cone is arranged above the flames and an air-passage is slotted of sufficient width for both the flames, but so arranged that the combustion is perfected when placed under the draught of the chimney. March 11, 1881. Price 4d.

The Gale of the 14th inst.—Nearly 100 cases of dangerous structures were reported to the Building Act Office of the Metropolitan Board of Works, in consequence of the gale on the 14th inst., in connexion with which buildings, excepting in one instance, no loss of life occurred.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

INTERNATIONAL COMPETITION FOR THE VICTOR EMMANUEL MONUMENT.

M. Otto Schulze, an architect resident in Rome who was present at the Museo Geologic Agrario, in the Viâ Santa Susanna, on the 22nd ult., when the last models were arriving in connexion with the above competition, states that 220 competitors had sent their works in by the afternoon of that day, and there were still a few more to be received. The city of Rome itself furnishes naturally a considerable number of the designs, viz., not less than forty. The exhibition of the entire collection will be opened in the middle of November. The maximum of 10,000,000 lire laid down in the conditions has been largely exceeded by not a few of the competitors, one of whom has sent in a design which would cost 100 millions to carry out. Most of the competitors, however, are within the sum allowed.

SEWER WORK AT BROMLEY.

Sewerage works are being carried out in Bromley by Mr. Potter, contractor, under the direction of Mr. Alfred Williams, C.E.; Mr. Garton, in the service of the Board at 3*l.* 3*s.* per week (appointed by the engineer), being the inspector. Serious charges are made against the latter to the effect that certificates have been given and moneys paid for work not done to a large amount,—the local *Telegraph* says to the extent of 1,000*l.* in concrete alone. A committee of the Board is investigating the matter, which has caused much excitement in the district.

SANITARY CONDITION OF THE YEOVIL PEASANTRY.

Sir,—Within the last few years the Yeovil Corporation has spent 30,000*l.* for a water-supply to the town. When the gentlemen composing that body decided to take that course, they had to deprive the river Yeo of part of that stream,—which, by the bye, had so often assisted in causing the floods on King's Sedgmoor. A certain noble landowner claimed the sum of 3,000*l.*, with costs, which the Corporation refused to pay. Consequently, a meeting was held before certain commissioners, at the Westminster Palace Hotel, where it is said the swearing and the rate-book widely differed. After all this hard swearing and enormous outlay of public money for the town, let us see the sanitary state of some of the houses. On the 15th of October I had occasion to pass by a place called Gore Knap, and the first thing that attracted my attention was a row of fifty-two houses, or rather hovels, with rooms about 10 ft. square, paved with broken bricks and stones, and filled in with dirt, from 6 in. to 10 in. below the level; some of the floors being 3 ft. 6 in. under the level of the path. In a rain-storm the water rushes in on these floors. Until three months ago there were only three water-closets; now there are two or three new ones put up, about 14 ft. from the front doors, which are public for any one. The only water-supply to these houses is that of a well 60 ft. deep, and yet they are not a quarter of a mile from the water-works, while the main pipe passes by them in suggestive proximity. There being but one w.c. to eight or nine houses, these poor people take it in turns to draw water out of the well in order to clear away the soil. This being by no means an easy or a pleasant task, it is often neglected, and then all sorts of disagreeable expedients have to be resorted to, such as ramming with broomsticks or pokers, clearing out with fire-shovels, &c. I saw two or three in a state quite unworthy of a corporate town like Yeovil, with its courts and boards and public officials. They were literally running over.

These houses have no gardens on which they can grow 5*s.* worth of vegetables. They are scarcely large enough to hang out the people's clothes,—those who have any. To see poor little children sitting about on the damp stone, brick, and mud floors looking as pale as death, their parents without money, fire, or food, is heart-rending. These houses are neither water nor wind tight. Many have as substitutes for beds a bag of straw, with scarcely any bed-clothing. Their food consists of potatoes and dry bread, and not half enough of that. The wages of these men are from 9*s.* to 12*s.* per week, and no work half their time. The poor women add a little to the miserable income by gloving,—say 1*s.* 3*d.* to 1*s.* 6*d.* per week. The best men are only offered 10*s.* per week for farm-labour when they are wanted.

I wonder whether there is any inspection of nuisances in this fashionable country town. I should like to know for whom between 30,000*l.* and 40,000*l.* were spent. I went into one house, where two families sleep in one of these small rooms. One poor woman, with seven children, was crying because she had no food to give them.

Sir, I cannot conceive any persons worse off in any part of Ireland; and yet in this very town there are charities which ought to bring in to the poor no less than 10,000*l.* per annum. The people of Gore Knap, Yeovil, told me that when they were fortunate enough to get a bit of land some had to give at the rate of 12*l.* per acre per annum for it. What will become of the poor of Yeovil during this coming winter is a puzzle to

G. Mitchell,
"One from the Plough."

P.S.—These houses are let on the average at 2*s.* per week. Many of the people never taste butcher's meat unless they chance to be in a club. The visits of the clergy are like angels' visits,—few and far between. Schooling is from 2*d.* to 4*d.* per week.

"THE VICTORY OVER SEWER GAS."

Sir,—I see by your foot-note to Mr. Mineard's letter that you are afraid of being inundated with letters on this unsavoury subject,—and with some reason, I think,—but I shall keep this as short as I can, and hope you will be able to allow it a corner, just to show that Mr. Mineard's system and the supposed necessity for ventilating *down* the soil-pipes rests upon a fallacy. Mr. Mineard writes of "the air current tending upwards, but always checked by the sewer-gas generated in the soil-pipe, which, *being heavier*, was trying to go down."

Is the sewer-gas generated in the soil-pipe heavier than air, and if so, why? It consists of a complex mixture of gases, none of which, except the carbonic acid, which is only present in small quantity, is heavier than air, and the sulphuretted hydrogen is very much lighter. Even if the gases were heavier than air at the same temperature, yet being generated by the fermentation of sewage they are heated by that same fermentation, and so are rendered lighter than they would be if cold. This is a point which is often overlooked with relation to carbonic acid. In many books on ventilation it is stated that, as the air expired by men and all animals consists chiefly of carbonic acid, and as carbonic acid is heavier than air, it will fall to the floor of a room and should be withdrawn there. Truly, carbonic acid is heavier than air *at the same temperature*, but the carbonic acid breathed from a man's lungs is at a temperature of nearly 100 degrees, and is therefore vastly lighter than the ordinary cold air of a room, and therefore rises to the ceiling. We all know the case of the monkey-house at the Zoological Gardens, which it was desired to ventilate on correct scientific principles, and without draughts. The question was, where should the outlets for the foul air be? The scientific (?) men said that as the foul air it was desired to get rid of consisted chiefly of carbonic acid, and as carbonic acid was heavier than air, the outlets should be at the bottom of the house. Accordingly, the builder made a row of outlets just above the floor, and none at all in the upper part of the house. It is not known whether any foul air ever did come out at these outlets,—probably it did when it had had time to get thoroughly cold, but the monkeys were all dead long before that.

I wonder that Mr. Mineard, who seems to be a practical man, has not detected the fallacy of his theory that the gas generated in a soil-pipe has a tendency to fall in that soil-pipe. The Engineer to our Association has, in the course of the last year, inspected hundreds of houses fitted with open soil-pipes and a proper intercepting trap with air inlet, and has always found that the air current was in at the inlet and up the soil-pipe. The engineer to the Edinburgh Association has found the same, and Dr. Alfred Carpenter, of Croydon has found the same. How could this be if the gas generated in the soil-pipe were heavier than the air?

I quite admit that in the majority of cases the current is a feeble one, because if the pipes are in a tolerably good state, no great amount of fermentation of sewage is taking place in them, and no great amount of sewer-gas is being generated. In some cases our engineer has reported that the current of air in at the trap was enough to "tear the hair off his head," but that has generally been when the soil-pipe was inside the house and in a warm position, or where it was outside and heated by the sun. I also admit that in such soil-pipes the air current is momentarily reversed when a flush of water is sent down the pipe, but this does no harm. A puff of air from the pipe is sent out at the air-inlet of the trap; but, in the first place, it does not often happen that anybody is standing over it just at the moment; and, in the second place, if the pipes have been well kept, and frequently and thoroughly flushed, he does not perceive any smell even if he is. After the momentary reversal the air resumes its usual course, in at the inlet and up the soil-pipe. I do not mean to dispute Mr. Mineard's "Victory over sewer-gas" at all. It is like using a steam-hammer to crack nuts. Nobody ever doubted that if he liked to connect an upcast-pipe with the foot of a soil-pipe, and burn a gas-jet in the upcast-pipe (or, still better, take it up a warm chimney), he would get a current of air down the soil-pipe, and it did not need Mr. Mineard to go "on a visit to the North" to find that out. I merely maintain that such an elaborate and expensive system is quite unnecessary; that the desired current of air can be maintained through drains and soil-pipes by much simpler and less expensive means; and that so long as there is a free current, the occasional reversal of the direction of it is not of the smallest consequence.

Cosmo Innes, M. Inst. C.E.,
Secretary London Sanitary Protection Association.

Sir,—The above title is scarcely warranted either by the facts as set out in Sir Henry Cole's letter of the 1st or by Mr. Mineard's explanations.

I am glad to find that the untrapped wastes from bath, lavatories, &c., existed only on paper, and these errors admitted there is much in the sanitary arrangements of the building I admire.

I take exception to the distance the sewer, or drainage, gas has to be fetched. Its success depends upon:—1. Gas constantly alight; 2. Tight joints; 3. Air inlets to servants' water-closet, or others close to, must be carefully proportioned to those which are remote from the heating chamber.

Mr. Mineard ridicules the idea of defective joints occurring, and also the cost of the gas consumed. The *Sanitary Engineer* of New York, October 1st, page 499, describes a defective soil pipe joint, which is not unknown this side the Atlantic; nor can the annual cost, representing a capital outlay of 50*l.*, be disregarded; the suggested ¾-in. pipe to servants' water-closet does not provide an adequate air inlet.

I agree with Mr. Buchan that "the forces employed are costly," and, if victory is obtained, a strong garrison must be left in charge of the fortress to watch the enemy.

A system which will give reasonable security, economically, and especially in a self-acting form, is, to my mind, much preferable.

I have since 1875 be'd on to the principle I have used at the Post-office here, which simply provides an air inlet inside the sewer trap, and the soil-pipe carried above the roof, surmounted by an exhaust cowl,—the method being now compulsory in these towns where the model by-laws, issued in 1877 by the Local Government Board, have been adopted. Some of the expensive traps and cowls afford additional security, but these details depend upon the length of the proprietor's pocket

John Parker,
Borough Surveyor, Bridgwater.

The Birkenhead Borough Hospital.—Last week the Mayor (Mr. W. Laird) met the executive committee of this institution, at the hospital, for the purpose of formally handing over the extensions which have recently been made to the building. These additions were rendered necessary by the taking into use of another ward, not hitherto required. A second story has been added to the centre building, which contains four bedrooms for the use of nurses and servants. On the north side an annexe has been erected, containing a new operating-room, 18 ft. by 18 ft., lighted by three large windows and skylights, and approached from the principal staircase, between the ground and first floors. Below is a waiting-room for visitors, lavatories, and cloak-room, and in the basement large store-rooms. It will be remembered that the hospital was originally built by the late Mr. John Laird, and it is to the generosity of his son (the present mayor) that the town is indebted for the recent work, by which it has been considerably enlarged and completed. The contractor was Mr. Alexander Bleakley, of Birkenhead, and the whole of the work was carried out from the plans and under the superintendence of Messrs. Aldridge & Deacon, architects, of Liverpool. The cost of these alterations is about 1,000*l.*, the whole of which has been defrayed by the liberality of the mayor.

THE ARCHITECTURAL ASSOCIATION.

The opening *conversazione* of Session 1881–82 takes place this Friday evening, the 28th.

The syllabus of papers for the Session is as follows :—

Nov. 11.—Address from the President, Mr. Aston Webb.
Nov. 25.—"The New Examination, and what it involves." By Prof. T. Roger Smith.
Dec. 9.—"Barnacles." By Mr. Cole A. Adams.
Jan. 6, 1882.—"A Chat with the Younger Members on the Writing of Specifications." By Mr. Ewan Christian.
Jan. 20.—"Architectural Inconsistencies." By Mr. Philip E. Masey.
Feb. 3.—"The Treatment of Sculpture with Architecture." By Mr. Hugh Stannus.
Feb. 17.—"Physical Science in Relation to Architecture." By Mr. J. Slater.
March 3.—"Ideal Dwelling-Houses." By Mr. E. Ingress Bell.
March 17.—Members' *Soirée*.
March 31.—"Sundry Working Drawings." By Mr. J. P. Seddon.
April 21.—"Some Thoughts on the Principles of Design and Style in Church Architecture." By Mr. B. E. Ferrey.
May 5.—"Coloured Decorations." By Mr. G. Aitchison, A.R.A.
May 19.—"Markets." By Mr. John Hebb.
June 2.—"The Influence of Ritual on Church Architecture." By Mr. E. Eldon Deane.

COMPETITIONS.

Birkenhead.—Designs are invited in competition for a New Town-hall in Hamilton-square. A preliminary competition of sketch designs is open to all, and the authors of five of them will be selected to compete finally. Mr. Chas. Barry has been appointed to act as referee in both cases. The style of architecture is to be such as will harmonise with the adjoining buildings. Each of the five competitors will be paid 75*l.* towards his expenses, and the author of the design placed first will be employed to act as architect, and be paid the usual commission, 5 per cent. The cost is not to exceed 42,000*l.*

Oldham Free Library, Museum, and Art Gallery.—The first premium (100*l.*) has been awarded, we understand, to Mr. Thos. Mitchell, architect, of Manchester, for design marked "F.S.A." The style adopted is Domestic Gothic, and the arrangement appears to meet all the requirements of the Town Council. The second premium (50*l.*) has been awarded to the authors of of the design marked "Practical,"—Messrs. Wright & Rawcliffe, of Burnley. There were twenty-six competitors.

East Looe Church.—The Committee for the re-building of the East Looe Church have received thirty-three designs. Almost from John o'Groat's to Land's End do the competitors hail. The 29.h ult. was the last receiving day, the Committee meeting about a week later to view, and, if possible, select. Four designs were put aside, as being most suitable, to be sent to London for an architect to report on their respective merits, and to ascertain how far the condition as to cost had been adhered to by their authors.

Buenos Ayres Government Buildings.—The number of plans received by the Argentine Consulate in Hamburg for the competition of the new Government buildings at Buenos Ayres within the time allowed for sending in from German architects is no more than five.

SURVEYORSHIP ITEMS.

West Ham.—Mr. Lewis Angell, engineer and surveyor to the West Ham Local Board, has been awarded a honorarium of 200 guineas, with salary increased to 800*l.* per annum, without any interference with his private practice. Mr. Angell declined 1,000*l.* per annum with limitation to consulting practice.

Hereford.—For the appointment of City Surveyor, at 250*l.* per annum, one hundred and forty-nine applications were received, and the committee selected the following five gentlemen to attend a special meeting of the Council, viz., Messrs. J. Parker, Bridgwater, borough surveyor; T. Tylecote, Halifax, assistant surveyor; A. Holt, Beverley, borough surveyor; E. Kenworthy, Handsworth, surveyor to Local Board; W. L. Franklin, Reading, assistant surveyor. Ultimately Mr. J. Parker was elected.

West Sussex.—At the meeting of the West Sussex magistrates in connexion with the Michaelmas Quarter Sessions on the 20th inst., Mr. Thomas Skinner, of Horsham, was, on the recommendation of the County Highways Committee, elected County Roads Surveyor, at a salary of 100*l.* per annum.

OBITUARY.

Mr. Thomas Fraser, C.E.—The death is announced of this gentleman, who for some years has filled the post of Burgh Engineer for the city of Edinburgh. Mr. Fraser in 1855 entered the Burgh Engineer's office as principal assistant to the late Mr. Charles M'Pherson, whom he succeeded in 1872, after serving about six months as *interim* chief of the department. He was actively employed in carrying out the new paving and drainage arrangements provided for under the recently-passed Municipal and Police Act. About two years ago he was disabled by a complication of ailments, which eventually developed into consumption, under which he has succumbed. Mr. Fraser, who was about fifty years of age, died a bachelor.

THE NEW COMEDY THEATRE, PANTON-STREET.

Sir,—I am fully aware of your disinclination to publish complaints, but when the public safety is involved it is your duty to depart from such practice. The following words concern the new theatre (Royal Comedy), built under new laws and special superintendence for the protection of the public. Listen to my experience. Declining to add to the already high prices by paying an extra shilling (our theatrical extras are far too many) for booking a place, I resolved to go into the pit. Arriving some fifteen or twenty minutes before the doors were advertised to be opened, I found a crowd of about 100 persons had already assembled. I leave it to your imagination as to how many arrived during the succeeding fifteen minutes. At last a crack was seen between the double doors, which resulted in an immense and disagreeable compression of one's body. But no one appeared to advance towards the interior of the building. During that time I felt for those who were quietly, but not willingly, squeezed against the angles of the reveals of the doorway; but as no doubt they felt more than I fortunately did on that point, I turned my thoughts to my own protection. After some time, having undergone as nearly as possible breakage of my wrist, I reached the aforesaid crack, which turned out to be the partial opening of the doors, forming a kind of narrow funnel, just room enough for one person to get through sideways. Close to the edge of the door was the money-taker, at the top of some eight or nine stone steps behind the payer, who, had he stepped back 18 in. must have found himself falling down, and down which I nearly did fall, having found my poor feet, not recovered from being trampled upon, entangled in part of a lady's costume, how got there is easily guessed at. I may say here that the gallery-door appeared to me to be only a few inches from that of the pit; and no doubt the delighted "gods" were undergoing the same process of crushing, and, consequently, the two crowds must have been mixed up in the centre. Had the pressure burst open the pit-doors I should not have liked to have been among the first fifty, who would have been pushed down the stone steps.

Is this the result of the new laws for the protection of life and limb? If so, away with the laws and let the public seek to protect themselves. Is it possible that legal sanction has been given to such an arrangement? If not, how came the house to be opened? I suppose the laws impose a penalty for opening without a certificate; and unless the certificate is refused—which I saw was applied for last week—until the means of entrance be altered there must be an accident. I also perceived that a report was presented at the meeting of the Board of Works last week saying that two doorways at the Opera Comique had been widened and altered satisfactorily. Have those who have to report upon such cases inspected the doorways at the Comedy Theatre? The arrangement of the pit is bad. One gangway only down the centre; the seats (every alternate one with a back) running from this to the side walls, holding about thirteen or fourteen persons. Should the end person wish to go out, he has to squeeze past twelve or thirteen others before accomplishing the feat. I had to sit all the time with my toes only resting upon the floor, and even then the seat before me pressed most miserably against my shins. It was an impossibility to place my feet down flat. I also found that the spectators at the back of the pit could only see as high as the heads of those on the stage—my prospect was half way up the scenery, the ceiling under the dress circle being so low and oppressive. The ancestral shades of the ancient foot-lights are here in use. Some houses have improved on that ridiculous arrangement by having the lights below the stage floor. Of the other parts of the house I am not able to speak, not having yet visited them. The curtain is quite below criticism: a discredit to Messrs. Howell & James. This, Sir, is our improved London Theatre, built, as I have said, under new laws and special superintendence.

Y.

THE INSPECTION OF THEATRES, &c., IN THE METROPOLIS.

The Building Act Committee of the Metropolitan Board of Works, reporting to the Board at its meeting on the 21st inst. with reference to the question of the inspection of theatres and other places of public amusement in the metropolis, stated that the architect is authorised by the 21st section of the Metropolis Management and Building Acts Amendment Act, 1878, to enter and inspect such places, and they now recommended that the Assistant Architect be also authorised by the Board in writing, under their seal, to enter and inspect the same. This recommendation was agreed to.

THE DRAINS OF ANCIENT ROME.

Sir,—In your issue of the 8th inst., under the heading of "Sanitation in Ancient Rome," appears the statement that the Cloaca Maxima, constructed under Tarquinius Superbus, was a common sewer, and that it ranks with the best sewers of our times, as regards excellence of construction. This is a mistake. The Romans did not pour fæces into underground sewers: these were used exclusively for carrying off the storm water to its natural destination,—the river. It is a well-known fact that about fifty years ago corporate bodies seized upon and used water-drains for carrying sewage, and to this arbitrary and senseless act we are indebted for that great nuisance of our degenerate age, —gigantic sewers on the pernicious *combined system*,—the very worst extant.

Chas. Kroll Laporte.

UNPROTECTED CHURCHES IN EAST ANGLIA.

Sir,—I have read with interest the paragraph in your paper on this subject, in as far as lightning-conductors are concerned. There is another precaution which, however, is neglected, and that is the fire protection generally of the sacred edifices of this country. Most of the cathedrals have, certainly, hydrants, fire-engines, and at Canterbury Cathedral there is a "Merryweather" steam fire-engine, which will throw a jet of water over the pinnacles of the Bell Harry tower; but I think I am correct in stating that there are not a dozen churches that po sess any means whatever of putting out a fire. Fires in churches increased during the last and severe winter to an alarming extent. Now a church is just the building where fire apparatus can be fixed with excellent effect and at small cost. Most churches have high towers or spires; in these should be fixed a tank with a main from tank to basement; two hydrants would suffice, one to command the organ-loft, and the other the vestry and body of the building. Water could be readily pumped up by means of a hand crank-pump in order to keep the tank full, and this need only be done four times a year in order to keep the tank free from foul water. Two hundred pounds on the architect's estimate would in most cases suffice to carry out the fire-extinguishing machinery in an effectual and workmanlike manner. There is more money-value damage done by fire to our churches than by lightning, and invariably the cause is the heating apparatus. There has been a law passed in Sweden to the effect that every church shall be provided with at least a London Brigade hand-pump, and my firm has already sent some hundreds to the churches in that country. In many of our old and valued churches there should be at least two hand-pumps,—one for the organ-loft and the other for the vestry, and a dozen fire-buckets,—the whole lot of which would not cost beyond 15*l.* to 20*l.* per building.

J. C. Merryweather, M.I.M.E.

DEFECTS IN HOUSE BUILDING.

Sir,—I took a house about a year ago, and have ever since been annoyed by a most unpleasant smoky smell. Sometimes smoke comes through the floor of my basement passage in volumes, but usually there is nothing visible, merely an unpleasant smoky smell pervading the whole house more or less. The house is very badly built, and the party walls are quite hollow. There are, I fancy, cracks both in my own and my neighbour's chimneys through which the smoke finds its way into the party walls, and from thence gets into the rooms. My landlord sent some men who pulled up the flooring and plastered the walls between the joists and the ceilings, with the result of making matters rather worse on the whole.

What I am anxious to know is whether any architect or builder among your readers has had a similar case to deal with, and has dealt with it successfully. If so, I should like to be put into communication with him.

E. K. Heavey.

HYDRAULIC DIFFICULTIES.

Sir,—In your issue of the 8th inst. "Greenhorn" desires some information on the subject of "Hydraulic Difficulties." I think a good way of getting over his trouble will be to sink an iron cylinder in the well with a solid bottom. It would be somewhat expensive, but most effective. J. C. M.

EXPERIMENTS ON TRAPS.

Sir,—I was somewhat surprised on reading a letter in your issue of to-day signed "P. J. Davis," in which he states that the action of the "Eclipse" trap is the same as that of the "O." Now, in the face of the experiments made at the lectures to which P. J. D. refers, and at which I know he was present (as I saw him there), by Mr. J. Stevens Hellyer, in which it was shown clearly enough that the "Eclipse" trap was not siphoned, either by the momentum of the water or by the siphonage set up by the action of the same, whereas the O trap was completely emptied, I marvel that he should risk his reputation as a practical man by making such an assertion, and I must say I am extremely sceptical as to the alleged result of the experiments conducted by Mr. Fullen, and as to the originality of the improved trap mentioned. P. J. D. appears to be eating his own words, as it was only the other week that I read a letter of his in a trade contemporary on the "Eclipse" trap extolling its virtues in every way. James Rankin.

* * Since the above was in type, we have received notes from Mr. John Smeaton, Mr. Daniel Emptage, and others, challenging the statement made by Mr. Davies, but we cannot find room for them.

Books.

Modern Architectural Designs and Details. New York: W. T. Comstock. London: Trübner & Co. 1881.

This book, which, like a good many architectural publications which reach us from America, has no author's name on the title-page, is a collection of what would be called, we presume, model plans and designs in domestic architecture, chiefly for country-houses. The production of a book of this class in England is usually the work of an architect who brings it out on his own responsibility; in the United States it seems to be generally a speculation of a publishing firm, and apparently intended to provide designs for those who wish to be their own architects, or, at all events, to have a certain "say" to their architect in regard to the design and construction of their house. This book differs from some other American publications of the same class in that the designs are the work of architects whose names are given in each case, and comprise, we are told, "original drawings made by a number of prominent architects of different localities, prepared expressly for this work." We are not sufficiently acquainted with the prominent names in the profession in the localities referred to to know what their status in their own neighbourhood is; but the plans, views, and details are evidently the work of practised hands, and the whole are very well and carefully drawn, the book in general showing a much superior stamp of workmanship to that of many American architectural works that have been sent to us.

The general style of the houses shown exhibits more or less the influence of the new English taste in domestic architecture, though with a larger admixture of woodwork in the exterior design, and but little of the cut brickwork which is so much the fashion among us at present. The method of execution of the drawings does not, however, distinguish material very well. From the marking of the elevations it is evident that some of the houses are finished externally, for a part of their height, with tiles or shingle, with generally the ground-story of either brick or stone. The system of dividing the upper portion of the windows into very small panes, leaving the lower portion nearly clear, has evidently established itself on the other side of the water, and is introduced in almost every design.

It is difficult to say exactly what it is which prevents these designs from appearing inviting to the English architect's eye. The style of drawing, though most commendably neat and finished, is not such as to make either elevations or views effective, and it is possible that some of these houses may look a good deal more interesting in execution than they appear on paper as here drawn. But making allowance for that, there is a deficiency which we feel at once in turning over the book; a want of feeling for the picturesque side of architecture, whether considered in mass or in detail. This is the more apparent, because the intention obviously is to be picturesque, and some of the buildings, *e.g.*, that on Plate 45, "House at Short Hills, N.J.," are prettily grouped in regard to disposition and skyline. But there is a kind of prim character about the whole which results, perhaps, from the deliberate attempt to imitate the manner and style of houses of the Old Country without any innate sympathy with it. If the architects who made these designs are trying to give the old English house over again, they have not succeeded, and they would, perhaps, have done something a good deal better if they had looked less to precedents which they have not the genuine instinct for. The interior wooden details are all very carefully drawn, and with a desire to do what is in good taste, nor is there much in them that can be said not to be so, but there seems a very great sameness and want of invention in them. The best treatment in detail is in the drawings of the house at Fairmouth, N.J., by Messrs. Rossiter & Wright, Plates 65, 66, 67. The architecture of the house is exceedingly simple, but there is a distinct character about it, and the treatment of the woodwork is in very good taste. Throughout the volume the wooden details are usually what is suitable to wood, and so far are in good taste, but they seldom get beyond deserving just that praise and no more. The constructive details of the woodwork are carefully and minutely given, and generally the woodwork is well put together, though in some of the external woodwork there seems a deficiency in throating and other such precautions against weather. The specimens of perforated ornamental brass panels for ventilating openings, given at the end of the book, seem far too naturalistic for design in this kind of work: they should be more flat and conventional in type.

We looked over the plans with some interest to see if there were any points in house-planning that could be noted as suggestive or differing in any important points from general practice here. We observe that in nearly all the plans a "china-closet" contiguous to, and in most cases opening directly out of, the dining-room, seems to be considered an essential; in one case it is called "butler's pantry," and as, in another case, there is a sink shown in it, we presume it answers to what we shall call the butler's pantry here; but it is much too close on the family dining-room for our notions. A merit which may be noticed in the plans generally is a considerable variety and picturesqueness in the shape and proportions of the sitting-rooms,—more, on the average, than we generally find in English houses, where we run so much into respectable parallelograms in our sitting-rooms. In one house designed for the sea-side, instead of a dining-room there is a "dining piazza," a large extended verandah, in fact, for open-air dining; a good feature in a hot climate, but one which English sea-side weather would leave us little chance for here. We observe that in nearly all the plans the w.c. and bath-room are in the same apartment, a most objectionable arrangement, long since discarded in all well-planned English houses, and quite unworthy of the refinement of civilisation to which in matters of domestic life the Americans have attained. We can scarcely imagine that this represents the usual arrangement in good American houses, even on a moderate scale; but if it does, it should be altered.

To country-builders and proprietors who are unable to obtain the assistance of an architect, the book will be useful.

Miscellanea.

Church's Joint-maker.—We are not disposed to think that the method of joining leaden pipes patented by Mr. Church, and illustrated n our advertising columns, is likely to supersede the ordinary mode of "wiping" by hand, but under certain circumstances we have no doubt that it may be advantageously used. As our readers may have noticed, it consists in the provision of boxes, or moulds, of various sizes, so arranged that a joint may be cast, and any intelligent workman, duly reading the instructions, can, in the absence of a plumber, do this. In some cases, moreover, pipes are so shamefully ill-placed that it is not possible to make a fresh joint in the ordinary way, and then, as it seems to us, Church's method might be adopted with advantage.

The New Town-Hall at Huddersfield, which has cost nearly 40,000*l.*, was formally opened on the 18th inst.

A Technical School for Huddersfield.—The memorial stone of a building which is being erected in Huddersfield for the purpose of a Technical School, was laid on the 19th inst. by the Master of the London Clothworkers' Company. For some time the demand for technical instruction in Huddersfield has been continually increasing. So far as was possible this demand has been met by the Mechanics' Institute, with which the new school is to be associated, but the means at disposal were found to fall short of what was required, and steps were accordingly taken to extend the range of operations, which up to the present have met with great success. Subscriptions to the new building, which will cost about 12,000*l.*, have been given liberally. It is worthy of note that the funds have been chiefly contributed by the residents of the town and surrounding districts, aided by a grant of 2,000*l.* from the Clothworkers' Company. The subjects intended to be taught comprise pure and applied mechanics, machine and building construction, chemistry, especially as applied to dyeing, scouring, and bleaching; experimental physics, embracing light, sound, heat, magnetism, and electricity; mechanical drawing, and its application to machine and building construction; pattern designing, and its practical application to the loom, and other branches of the textile trades; and such other subjects in primary, technical, and industrial education as the council may from time to time think necessary. Mr. Edward Hughes is the architect of the new building.

The Forthcoming Health Congress at Brighton.—Brighton is looking forward with much expectation to the Health Congress and Sanitary Exhibition, which is to be held in the Royal Pavilion in December next (from the 12th to the 21st). The Mayor-elect (Mr. Alderman W. H. Hallett, F.L.S.) is taking an active interest in the affair. He is supported by an influential committee, and the arrangements are being made upon a very extended scale, with good promise of success. Dr. B. W. Richardson will deliver the inaugural address at the Congress, and we believe that a special feature in connexion with the exhibition will be the erection of a number of artisans' model dwellings in the grounds of the Royal Pavilion. There will be eight sections or classes, of which Class III. will include house sanitation and hospital construction and appliances; Class IV. will be devoted to industrial dwellings; and Class VI. to house decoration and fittings. The exhibition will include a loan collection of works of art from South Kensington. Mr. William Hamilton is the honorary secretary. Intending exhibitors should apply early for space.

Party Walls.—An application for an injunction to restrain Messrs. Cow, Hill, & Co., of Bread-street, Cheapside, from pulling down a party-wall was heard before a Divisional Court of the Chancery Division, consisting of Mr. Justice Cave and Mr. Justice Kay. The Union Assurance Society, who are now in possession of the next house, which was partly damaged by the late fire in Cheapside, are reinstating the buildings, and have received notice from the Commissioners of Sewers to repair the party-wall. This they have done. The defendants have received a similar notice, but instead of repairing they commenced to pull down, and, according to the affidavit on which the motion for an injunction was made, this was being done for the purpose, not of repairing the wall, but in order to put up larger buildings. The Court granted an interim injunction over the 2nd of November to restrain the further pulling down, on the managing director of the Union Assurance Society giving an undertaking to be liable in damages.

Conder's Bible Hand-Book.—We understand that a third edition of this work, reviewed in our columns on its first appearance in September, 1879, is in the press. It is, perhaps, without precedent in the case of any work dealing with Biblical subjects, for the authors to have received, as has been done in the present case, high tributes to the value of their work from an English Primate, a Roman cardinal, and a Jewish Chief Rabbi.

Value of Land at Fulham.—On Tuesday last Messrs. Driver & Co., of Whitehall, sold by auction, at the Mart, Tokenhouse-yard, some small detached plots of land in Crown-road, Munster-road, and Margravine-road, containing together 2 acres 3 roods and 10 perches, which realised a total sum of 4,840*l.*, or at the rate of about 1,720*l.* an acre.

The Camberwell and Peckham Improvement.—At the meeting of the Metropolitan Board of Works on the 21st inst., the Works and General Purposes Committee submitted plans of additional widenings in the main thoroughfares of the Camberwell and Peckham improvement, at an estimated total cost of 8,600*l.*; and recommended that the same be approved and adopted, and that the said thoroughfares be widened to the extent shown upon such plans,—*i.e.*, from 50 ft. to 60 ft. in certain parts. Mr. Dresser Rogers, in moving the adoption of the report, pointed out that the thoroughfares affected formed a main artery of traffic to an exceedingly crowded and rapidly-increasing district of the metropolis, for whereas by the census of 1871 the population of Camberwell parish (which includes Peckham) was 111,000, and the number of houses 17,000, the census of this year showed the population of the district to be 187,000, and the number of houses to have increased to 27,000. Mr. Rogers incidentally stated that some of the building frontages already let by the Board on the line of the widened thoroughfare had realised four times the rental anticipated, and it was the opinion of the Superintending Architect of the Board that the proposed extra widening of the thoroughfare would still further enhance the value of the building frontages, and that the Board would be recouped to a far larger extent, *pro rata*, by the letting of building frontages than had been the case in any other improvement. The recommendation of the committee was agreed to by a large majority.

A Year's Building in Edinburgh.—At a meeting of the Guildry of Edinburgh, on the 21st inst., Mr. R. Hutchison was re-elected Dean of Guild. He subsequently submitted a statement as to the business of the Dean of Guild Court for the past year. It appeared that the number of applications for warrant to erect buildings, and to execute additions to, and alterations on, property within the jurisdiction of the Edinburgh Municipal and Police Act, 1879, was 466. This included applications by the Procurator-Fiscal against parties proceeding with work requiring warrant of the Court without such, and against proprietors of property in danger requiring immediate steps for their safety to be taken. Of these applications, 440 warrants had been granted, including thirteen for fines and costs against wrong-doers. The warrants granted were for two churches, 202 villas, 113 tenements of shops and dwelling-houses, and 334 alterations and additions, with stall, conservatories, &c.

Edinburgh Health Society.—This is the title of a society of which the inaugural public meeting was held on the 21st inst. Its object is the promotion of the laws of health in Edinburgh and the vicinity. Treasurer Harrison, in moving a resolution, said he regarded the Town Council in a great measure as a Health Society; and related what had been done by the operations of the Improvement Trust in improving the health of the city, the death-rate having been reduced from 26 per 1,000, at which it stood in 1863, to 20 per 1,000. Typhus fever, he was glad to say, was now no longer epidemic among them. Dr. Walter C. Smith, in seconding another resolution, referring to the work of the Improvement Trust, remarked that they had still too many dark, airless closes in Edinburgh, and many houses which were not fit for human habitation. There was still a heavy burden of shame upon the city that there were so many of such houses, and that they were occupied by their fellow-citizens.

Typhoid Fever, with a fatal result, having been generated by the unsanitary condition and overcrowded state of the Exeter Post-office, the Sanitary Authority desired to inspect the establishment, in order that they might direct the necessary steps to be taken to improve the condition of the building. The Postmaster declined to permit the entry of the authorities, but yielded when a magisterial order was presented. The state of affairs in the telegraph department was so bad that the Town Council pronounced the building to be dangerous to the health of the city.

The Royal Albert Hall Choral Society.—The Season will commence on Wednesday, 2nd November, with a performance of Handel's "Judas Maccabæus," when the Orchestra will again be increased by the band of the Coldstream Guards. Mendelssohn's "Elijah" will be given on the 23rd November. Sullivan's "Martyr of Antioch" and Berlioz's "Faust" are to be performed.

Civic Banquet to the Royal Academy.—On Wednesday evening the Lord Mayor and the Lady Mayoress, in accordance with the annual custom, entertained at dinner in the Egyptian Hall, Mansion House, the members of the Royal Academy of Arts. The Lord Mayor, in proposing "The Members of the Royal Academy," expressed his regret at the absence of Sir Frederick Leighton, the President, and associated with the toast the name of Mr. Street, who, after dwelling upon the great value of the exhibitions of works of old masters at Burlington House, alluded to the difficulty the Academy still found in prevailing upon the owners of such valuable works to part with them, even for a time. Turning then to the unseen work done by the Royal Academy, of which little was known by the public, he briefly described the schools of the Academy, in which masters, models, and casts were provided, and some 400 students were at present receiving instruction. They were taught by competent masters, and were visited by twenty-three visitors elected by ballot from among the members of the Academy. Thus the students were brought into intercourse with some of the most distinguished artists of the day. Referring to Blackfriars Bridge, and certain works contemplated at the Guildhall, he expressed a hope that when the architect had done his part, the sculptor and the painter would be called in to complete the decoration of the structure. He hoped that the arts of architecture, sculpture, and painting would be so cultivated in this City that in future years people might think of London as they now thought of the old centres of civilisation and art elsewhere in Europe. The toast of the Royal Scotch Academy was responded to by Sir Daniel Macnee, and other toasts followed.

A Cathedral for Liverpool.—In his primary visitation charge, delivered on the 19th inst., the Bishop of Liverpool said,—The third chief want of the diocese of Liverpool is one which I feel great difficulty in handling. I refer, of course, to the want of a cathedral suited to the size and wealth of our diocese, and to the importance of the second city in Great Britain. I approach the subject with delicacy. It is a far wider and deeper one than most people suppose. I am often asked, "When are you going to begin your cathedral?" But few seem to realise what the idea involves. Let us consider well what we are talking about. Let us count the cost. We must remember at the outset that in this matter the new diocese of Liverpool starts at an immense disadvantage compared to every new diocese of modern times. We have everything to do from the very beginning. We have not a church in our city which is fit to be converted into a cathedral. We have no site for a new cathedral, except one behind the Gymnasium, in a disused cemetery, which many, perhaps, would dislike; and any other site would cost an enormous sum. The cathedral itself, to be worthy of Liverpool, would cost a quarter of a million before it was finished. If any one comes forward with a princely offer like that of the ladies who have built Edinburgh Cathedral,—or if any one will do in Liverpool what has been lately done at St. Patrick's and Christ Church Cathedrals in Dublin, or at St. Finbar's in Cork,—I shall be deeply grateful. For anything I know, it may be in the heart of some one even now to do this.

Building in the United States.—Judging from an announcement recently issued by the Bricklayers' Union in New York, it would appear that the demand for labour in the United States is unusually keen. The Union gives notice that its members are to cease work henceforth at all establishments which are not paying a minimum of four dollars a day. In some cases, it is said, as much as five dollars a day, or over six pounds a week English currency, has been paid to workmen. The rise in the rate of wages, it appears, has proved a serious misfortune to the great building firms who have large outstanding contracts to perform.—*Daily News.*

Solomon's Temple.—It is reported, says the *Times* correspondent, that the Sultan has given orders for the remains of Solomon's Temple to be restored, and the surrounding place to be cleared of all rubbish. On that place stands the Mosque of Omar, the revenue of which is said to amount to 150,000*l.* a year. Hitherto this sum has always been forwarded to Constantinople, but for the future it is to be appropriated for the above-mentioned purpose. This act of the Sultan is believed to be a result of the visit of the Crown Prince of Austria to Jerusalem.

The Rhind Lectures in Archæology.—Mr. Joseph Anderson, Rhind Lecturer in connexion with the Society of Antiquaries of Scotland, delivered the opening lecture of this year's course in the Freemasons' Hall, Edinburgh, on the 17th inst., taking as his subject "Scotland in Pagan Times." The second lecture, delivered on the 20th inst., was on "Viking Burials." The third lecture, given on Monday last, treated of "Celtic Art of the Pagan Times."

TENDERS

For schools, Higham, for the Walthamstow School Board:—

Hawkins	£6,091 0 0
Bentley	6,035 0 0
Fuller	5,898 0 0
Angard	5,790 0 0
Read	5,700 0 0
Scott	5,549 0 0
Higgs	5,355 0 0
Goode	5,309 0 0
Palmer	5,290 0 0
F. Higgs	5,148 0 0
Beale (accepted)	4,777 0 0
Vernon & Ewens	4,490 0 0

For additions to Blood Hills Farm-house, Somerton, near Great Yarmouth, for Mr. F. Charsley. Messrs. Bottle & Olley, architects:—

R. Davey, Yarmouth	£452 0 0
J. Harbord, Caister	423 0 0
W. Wilson, North Walsham	392 10 0
R. Bartram, Aylsham	383 10 0
J. Bachelor, Stalham	364 0 0
J. H. Want, Yarmouth	356 0 0
T. S. Cooper, Yarmouth (accepted)	328 0 0

For deep well, pump, &c., to the above:—

Norman & Son Yarmouth (accepted)	£16 0 0

For new lodge, &c., at Flixton, near Lowestoft, for Sir Savile B. Crossley, bart. Messrs. Bottle & Olley, architects:—

J. & B. Swatman, Lowestoft	£330 0 0
A. Bedwell, Lowestoft	445 0 0
J. Rounce, Blundeston (accepted)	411 1 0

For house and premises in the Bulmershe-road, Reading, for Mr. Thos. Wilson. Mr. William Simmons, architect. Quantities by the architect:—

Pollley, Queen's-road	£1,295 0 0
Wernham, Princes-street	923 18 0
Bottrill, King's-road (accepted)	898 0 0

For fitting up Balham Institute, Balham New-road, as a mission-hall, for the Rev. Thomas Bates, vicar of Balham:—

T. Potterton (accepted).

For converting stable and coach-house in Pickett-street, Balham, into a mission-hall, and fitting up same, for Mr. S. Cawston. Mr. A. Cawston, architect:—

T. Potterton (accepted).

For additions to Seamen's Infirmary, Ramsgate. Messrs. Hinds & Son, architects:—

Smith & Son	£348 0 0
Forwalk	247 0 0
Elgar	155 0 0
Home	155 0 0
Martin	143 0 0
Duckett	134 0 0
Miller (accepted)	123 0 0

For the erection of two semi-detached villas at Heme Hempstead. Mr. Walter T. Feldon, architect:—

J. Sear	£862 10 0
C. Monk	750 0 0
T. Flint	700 0 0
E. Horn	660 0 0
G. Capper	653 0 0
W. Carlin	630 0 0
G. Philbey	600 0 0

For the erection of a pair of semi-detached villas at Hemel Hempstead, Herts. Mr. Walter T. Feldon, architect:—

J. Sear	£1,235 0 0
C. Monk	1,068 12 0
E. Horn	990 0 0
G. Capper	912 0 0
W. Carlin, St. Alban's (accepted)	785 0 0
G. Philbey	655 0 0

For the erection of shop-front at Hemel Hempstead. Mr. Walter T. Feldon, architect:—

J. Sear	£350 0 0
W. Carlin, St. Alban's (accepted)	335 10 0

For road and sewer works, on the United Land Company's Elstree Estate:—

Marriott Bros.	£939 0 0
G. Felton	849 0 0
J. Clarke	825 0 0
J. Stockwell	795 0 0
Rowland Bros.	650 0 0
Wilkes & Co. (accepted)	646 0 0

For road and sewer works on the United Land Company's Church-road Estates, No. 2:—

J. Stockwell	£1,055 0 0
J. Pizzey	999 0 0
W. Crockett	995 0 0
W. Harris	929 0 0
Tomes & Wimpey	914 0 0
Rowland Bros.	890 0 0
Neave & Son	888 0 0
Dyer & Huntley	851 15 0
Wilkes & Co.	811 0 0
G. Felton (accepted)	783 0 0

For rebuilding No. 38, Duke-street, Aldgate, for the Trustees of the United Synagogue. Messrs. N. S. Joseph & Pearson, architects:—

Roberts	£775 0 0
Partridge & Henderson	690 0 0
J. Lidstone & Son (accepted)	638 0 0

For the erection of a school to provide accommodation for 1,400 children, in Mansford-street, Bethnal Green, for the School Board for London. Mr. E. R. Robson, architect:—

W. Brass	£15,493 0 0
J. T. Chappell	15,439 0 0
J. F. Sargeant	15,186 0 0
Kirk & Randall	14,996 0 0
Peto Bros.	14,964 0 0
G. S. S. Williams & Son	14,790 0 0
E. Lawrance	14,778 0 0
W. Tongue	14,664 0 0
Wall Bros.	14,523 0 0
J. Grover	14,487 0 0
S. J. Jerrard	14,449 0 0
Higgs & Hill*	14,344 0 0

* Recommended by Works Committee for acceptance.

For the erection of a school to provide accommodation for 1,200 children, in Wood-street, Woolwich, for the School Board for London. Mr. E. R. Robson, architect:—

Peto Bros.	£15,403 0 0
E. Lawrance	14,916 0 0
F. & F. J. Wood	14,884 0 0
J. Grover	14,705 0 0
J. T. Chappell	14,493 0 0
Kirk & Randall	13,668 0 0
W. Tongue*	13,546 0 0

* Recommended by Works Committee for acceptance.

For the enlargement of the Thames-street School, Limehouse, by 480 places, for the School Board for London. Mr. E. R. Robson, architect:—

F. & F. J. Wood	£5,436 0 0
G. S. Pritchard	5,299 0 0
E. Lawrance	5,284 0 0
B. E. Nightingale	5,181 0 0
C. Cox	4,921 0 0
Harris & Wardrop	4,920 0 0
S. J. Jerrard	4,850 0 0
Atherton & Latta*	4,800 0 0

* Recommended by Works Committee for acceptance.

For the enlargement of the Park-walk School, Chelsea, by 400 places, for the School Board for London. Mr. E. R. Robson, architect:—

W. Tongue	£3,581 0 0
W. Brass	3,366 0 0
W. Downs	3,247 0 0
Higgs & Hill	3,187 0 0
J. T. Chappell	3,156 0 0
W. Oldrey	3,098 0 0
J. Grover	2,988 0 0
Kirk & Randall	2,810 0 0
C. Wall*	2,720 0 0

* Recommended by Works Committee for acceptance.

For the enlargement of the Gipsy-hill-road School, Lower Norwood, by 400 places, for the School Board for London. Mr. E. R. Robson, architect:—

J. Marsland	£5,186 0 0
S. J. Jerrard	5,118 0 0
Kirk & Randall	5,113 0 0
J. D. Hobson	5,100 0 0
Stimpson & Co.	5,076 0 0
E. Lawrance	5,069 0 0
B. E. Nightingale	5,033 0 0
W. Tongue	5,027 0 0
C. Wall	5,000 0 0
Higgs & Hill*	4,958 0 0
W. Shepherd (withdrawn)	4,065 0 0

* Recommended by Works Committee for acceptance.

For the enlargement of the School in Edinburgh-road, Ladbroke-grove-road, by 400 places, for the School Board for London. Mr. E. R. Robson, architect:—

W. Tongue	£3,218 0 0
J. Rankin	3,119 0 0
Higgs & Hill	3,099 0 0
Wall Bros.	3,090 0 0
W. Oldrey	2,937 0 0
W. Scrivener & Co.	2,905 0 0
J. Grover	2,888 0 0
W. Shepherd	2,808 19 0
Stimpson & Co.*	2,773 0 0

* Recommended by Works Committee for acceptance.

For the Piccadilly Art Galleries, &c. Mr. E. R. Robson, architect. Quantities by Mr. R. Roberts:—

	Additional if Mosaic Pavement.
Manley	£37,341 0 0 ... £1,000 0 0
Webster	36,060 0 0 ... 880 0 0
Brass	35,523 0 0 ... 900 0 0
Trollope & Sons	35,240 0 0 ... 920 0 0
McGregor	34,627 0 0 ... 1,210 0 0
Wall Bros.	34,610 0 0 ... 1,180 0 0
Bywaters	34,339 0 0 ... 1,024 0 0
Holland & Hannen	34,262 0 0 ... 870 0 0
Kirk & Randall	34,211 0 0 ... 1,030 0 0
Higgs & Hill	33,840 0 0 ... 1,100 0 0
Chappell	32,500 0 0 ... 1,000 0 0
Peto Bros.	31,539 0 0 ... 1,009 0 0

For sewers and roads on land near the Midland Station, Wellingborough, for Mr. C. J. K. Woolston. Mr. E. Sharman, surveyor:—

	Contract No. 1.	Contract No. 3.
Maycock, Wellingborough	£743 0 0	... £177 0 0
Henson, Kettering	669 0 0	... 155 0 0
Henson, Wellingborough	636 0 0	... 145 0 0
Willmot, Rushden	636 0 0	... 140 0 0
Underwood, Wellingborough*	615 0 0	... 144 0 0

* Accepted.

For the erection of Congregational Church, with vestries, schoolroom, &c., in Seven Sisters-road, Finsbury-park. Mr. Chas. H. Searle, architect. Quantities supplied:—

Scurrah	£13,119 0 0
Brass	12,000 0 0
Manley	11,939 0 0
Macey & Sons	11,946 0 0
Little	11,693 0 0
Williams & Son	11,580 0 0
Nightingale	11,423 0 0
Patman & Fotheringham	11,283 0 0
Dove Bros.	11,176 0 0
Harris & Wardrop	10,992 0 0
L. H. & R. Roberts	10,284 0 0

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ONE 8-H.P. PORTABLE STEAM ENGINE, in use a few months only. In capital condition. To be Sold at a great reduction.

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ONE 8-H.P. VERTICAL BOILER.
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ONE COMBINED MORTAR-MILL and ENGINE (Portable). Very strong. (See illustration on p. vi.)

ONE MORTAR-MILL, with 6 ft. 6 in. Revolving Pan. Reynolds's "Spécialité," with Timber Bed complete. Second-hand.

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ONE HAND-POWER CROSS-CUT SAW-BENCH (Second-hand), with 18 in. Saw.

ONE PANEL PLANER, to Plane Wood up to 16 in. wide, 30/.

SIX BAND-SAWING MACHINES, for foot or steam power, with 18-in. pulleys, price 10/. 10s. each.

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SIX do. do. do. on strong pillar stand, 7/. 7s. each.

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The Builder.

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A Burning Social and Industrial Question.

IT is now some weeks since our attention was pointedly called, from a source very intimately connected with the direction of the scientific industry of Great Britain, to the problem, which was then felt to be about to become urgent, of the application of convict labour. The great works at Chatham and at Portsmouth, on which a large portion of such labour has of late been occupied, are at or about their close, so that the question, which is admittedly a very difficult one, calls for immediate attention.

The difficulties which beset this question may be classed as mechanical, moral, and economical. Of these the last are the most perplexing. It may be conceivable,—and we hope to show that it is very practicable,—to organise, under military guard, a system of convict labour which, to say the worst of it, cannot be more heavy on the operatives, or more difficult to guide within exact limits, than was the toil that erected the pyramids of Egypt. The moral objections apply chiefly not so much to an organisation of this kind, as to the employment of convict labour on the highways, or in any public situation, where the humiliation of the prison dress, the loaded rifles of the sentinels, or even the physical restraints upon the captives, may be thought to add appreciably to the sufferings, and, moreover, to harden both their hearts and those of the spectators of the toil. Of this we have ample evidence in Italy, where the spectacle of men in sulphur-coloured or red clothes, and even at times in irons, at work on the roads under the muzzles of the rifles of the sentinels, was not an unusual sight,—at all events, a few years ago. This difficulty, however, may be called a local one, and hardly arises except in case of such a wide distribution of convict labour as in itself is in many other respects unadvisable.

There remains the economical question: to wit, how far is it just to the ordinary labourer to affect the market demand for labour, and thus to lower, it may be, the ruling rate of wages, by the competition of labour which is in a certain sense gratuitous,—that is to say, of the labour of hands that must be fed and supported by the State, whether they work or not? And this objection applies with equal force to pauper labour. That it must be a serious difficulty is evident from the fact that, while the numbers of criminal offenders convicted, in 1880, in England, Scotland, and Ireland, amounted to 15,643, and while the able-bodied paupers, in the same year amounted in England to 111,169, and in Ireland to 9,278 (in Scotland the able-bodied paupers are not distinguished), such appeals as those which have been heretofore made in our columns as to the employment of wasted labour on "Lands that want Hands" have as yet failed to lead to practical results.

It is a natural suggestion that the employment of prison labour in supporting prison establishments, is a proceeding which is not liable to insuperable objections on either moral or economic grounds. But here come in what we call the mechanical difficulties, that is to say, within the precincts of the prisons there is only room for an employment of a limited number of prisoners, on such trades as they may be able to work in. There still remains a large bulk of convict population,—the whole number has been estimated at about 20,000,—for whom there is no indoor work. Are we, then, to regard these men as subjects for vengeance, or for reformatory treatment? That is the first question. They are sentenced to hard work. Well and good. But is that work to be of a brutalising or of an improving character? There is, we apprehend, little doubt that evidently useless work, such as the treadmill, or the shot drill, is the first. And we hold, believing in the nobility of work, that all distinctly useful work has in it something, however little it may be, elevating to the character of the workman. The most uninstructed agricultural labourer may rank very low in the scale of civilisation, but he stands on a step appreciably higher than that occupied by either the idle pauper or the convict on the treadmill.

If these views be true,—and we do not hold that they are either novel or debateable,—the question as to the proper mode of dealing with the large amount of convict and pauper labour which is likely to be absolutely wasted and lost to the country assumes the form of the least difficult of the three cases of dilemma. It becomes a mechanical difficulty where and how are these numerous strong men to be set to useful work, without either ousting the honest labourer, lowering his wages in the market, or presenting the demoralising aspect of men on whom our common burden,—that of working in some way for our bread,—is imposed under conditions that not only humiliate the worker, but degrade the dignity of work.

We venture to suggest a solution of this problem. The total area of bog in Ireland is estimated at 2,830,000 acres, nearly one-seventh of the entire surface of the island. Of these bogs there are 1,576,000 acres of flat bog, the remaining 1,254,000 acres are mountain bog. Without entering into chemical details,—which however, we are fully prepared to do,—we may state as an uncontradicted fact that nothing but well-directed labour is required to convert the greater portion, if not all, of that land, now waste, into the richest pasture or corn land. Drainage is the first, and in many cases the only, requisite, to effect this change. Burning the surface of the bog, after draining, has in some places had an admirable result. Claying the bog, by extracting the clay which lies below and forms an impervious bed, and placing it as a top dressing, is the method which has been followed in other cases, as in our own Bridgwater levels, with the result of turning waste swamps into the richest pasture or hay-growing lands in the kingdom. Whichever of these methods be adopted, there is the remarkable characteristic that only labour is required. No more capital is wanted than will suffice to feed the workpeople. In some cases, probably, steam-power would aid in the work of drainage. But even that would be fed from the spot, as the turf possesses very great advantages as a steam fuel if the flues of the boiler be designed properly for the consumption of turf. It is only last week than an "Ulster Landowner" writes to an English daily journal to say, "The great flat bogs, such as the bog of Allen, can no doubt be converted into most valuable land, but the expense would be great, and the work could only be undertaken as a whole, involving the execution of very great works. No owner of a few hundred or thousand acres on the fringe of the bog can drain this portion while tens of thousands of acres behind him remain undrained."

Here, then, are present all the elements for the solution of more questions than one. There is a great work to be done,—a work so large that it is beyond the reach of any private enterprise. Nor does it, for reasons into which it is unnecessary now to enter, present any temptation for joint-stock enterprise. On the other hand, it is a work involving immense national benefit. All neighbouring landowners would be enriched by the reclamation of this enormous bog. The island would have almost a new county added to its productive area. No money need be sunk in the bog. It is only requisite to apply to it that muscular force which is fretting itself into deeper poverty and misery by enforced idleness. Of course, proper engineering direction is required. But that is at the command of the Government. It is not necessary here to enter into any detail on that point. That the proper mode of attacking the bog is a matter for ready scientific determination every Woolwich cadet is aware. What is required is simply, enough labour under scientific direction As before said, it may be a question whether steam power may not be called in with advantage. No doubt, all pumping, if pumping be requisite, could be effected by convict or pauper labour, and would be self-supporting, or remunerative, if so effected. But when we consider that even the most clumsy and extravagant form of boiler will supply the power to effect this pumping at one per cent. of the cost of human manual power (taking that at the cost of wagon-filling on an English railway), and when we reflect that we want the work to be done, as

well as the men to be employed, we think no unnecessary strain should be put even on convict labour.

Local accommodation, such as our railway navvies are in the habit of providing for themselves, would, of course, be requisite. Proper military surveillance of the district and of the labourers would be essential. The mark system might be introduced, for the encouragement of the men; a certain number of marks having a definite time value for the shortening of their term of punishment, and even providing them with something with which to begin the world again when free. Not a single labourer in the three kingdoms could have a word to say, justly, against such a plan. The work is altogether unlikely, in our time at least, to be attempted in any other way. The result of it would be to provide an extended field for the labour of the Irish agriculturist. In most cases of any new industrial suggestion the *pros* and *cons.* are many, and it may be difficult to foresee which scale of the balance will descend. As to the reclamation of the Bog of Allen,—or, for that matter, of any other bog to be selected by the expert,—by labour that is now wasted or worse, we can see a great many *pros*; but we have to wait for an exposure of the *cons.* that cannot be met.

THE EDUCATIONAL AND TECHNICAL VALUE OF PUBLIC COLLECTIONS.

The practical value of public collections in the service of education is evidently taking a foremost place in matters of general public interest. From Classic times at least, the fashion of collecting has existed. Roman consuls furnished their houses with Greek works; Cicero condemns Verres, a governor of Sicily, for his wholesale seizure of precious objects made by workmen of Corinth and Delos. As Roman splendour declined so did early collections become dispersed in the misfortunes of wars and plunderings carried on by Huns, Goths, and Lombards. Until the Renaissance the practice of collecting lay in abeyance. Cola di Rienzi is considered to have revived it; but he is not credited with having had more than a desire to possess antiquities. His friend and admirer, Petrarca, was, it appears, more of an antiquary, having a keener insight into the virtues of works of art. Still there was scarcely a genuine amateur collector until the great Lorenzo di Medici arose. His times are marked by the establishment of the Florentine Accademia which he furnished with statues, busts, and other pieces of ancient workmanship. His school for sculptors stands high as having been the training ground of Michelangelo. Under Lorenzo's patronage a love for the fine arts seems to have spread with rapidity, and Italian artists and art-workmen soon abounded in great numbers, to supply the wants of their art-loving patrons.

In the antiquaries of the seventeenth and eighteenth centuries a sense of spreading some sort of useful and serious instruction was certainly alive. But even when Winckelmann produced his "History of Art," the value of technical teaching to artists and manufacturers in respect of materials and modes of workmanship does not appear to have been realised in this country. Prolix discourses by a Martinus Scriblerus, and anecdotes by a Horace Walpole sometimes still serve as models of style for the utterances of a few of our *virtuosi* and *cognoscenti*. The idea of giving to great numbers of persons some "technical instruction" by means of collections is virtually modern.

Much as individual curators and keepers of public collections have endeavoured to lay clearly-defined lessons before the public, Select Committees of the House of Commons and Royal Commissions will probably be the framers of schemes or *curricula* of instruction of which public collections are to be the exponents in this country. The British Museum was commenced as an emporium of things esteemed for being "rare and curious." It has in due course slowly developed branches which have some special knowledge in view, such as ethnology, archæology, natural history, &c. The National Gallery propounds a history of painting, the National Portrait Gallery tells us about portraiture, and the South Kensington Museum had for its mission at starting the culture of consumer's and producer's taste in the many ramifications of artistic handicrafts.

From the period of the Italian Renaissance to the present, the learned Müller has assigned three phases of people's appreciation of works of art. The first he considers is artistic, when "ancient works of art were taken up with joy and love, and collected with zeal,"—"there was little interest felt in them as historical monuments; enjoyment was the object." This period of sentiment, within the present century, finds many votaries. It is present in Shelley's apostrophe to a Greek vase. It is perpetuated by Mr. Ruskin, following whose lead is an army of disciples to whom "a thing of beauty is a joy for ever," and nothing more. The second period is the "antiquarian," when nomenclature of antique statues was much attended to. The basis of knowledge then put forth was antiquity rather than perception of artistic principles. The antiquarian period still survives. Müller's third period is the "scientific"; and this is marked by numerous attempts, philosophically and historically, to investigate art, "and to supply circumspect explanations of art." At the British Museum and the National Gallery there are evidences of this scientific period. At South Kensington the manifestations of its influence are just now various.

For some years the collections at the Kensington Museum had for their aim what appeared to be the technical explanation of the industrial arts. The museum was started on grounds totally distinct from those of any existing public collection. It did not concern itself with either ethnology or archæology. The backwardness of our artistic manufactures was a cause of its creation. The country seemed to have awakened to its want of instruction as to how materials had been used and the different processes which had from time to time been employed in the production of works of art. And so South Kensington Museum came into being, to tell artisans and designers, their employers and customers, what had been done, and was being done, in artistic handicraft. "Technical instruction" was an officially used term in 1852. When Marlborough House contained the nucleus of the present inestimable collections belonging to the South Kensington Museum, a system had been devised for acquiring objects which, in the first place, were to be of "technical (manufacturing) or scientific interest." The generic divisions of the collections so formed were to be ruled as far as possible by character of materials,—like wood, stone, glass, metal, &c.; whilst the *species* of these generic divisions would be "the technical embodiment," or processes, "as, for instance, cast, hammered, moulded, carved, blown, &c." Date, local origin, &c., were of subsidiary importance. Besides this carefully-considered scheme or policy for the formation and arrangement of the Museum, classes existed for giving "technical instruction" in various branches of art. These classes were the offspring of the older schools of design, the reports upon which, dating from 1841, are devoted to the establishment of a system of practical and technical instruction in the fine arts. At Marlborough House, Professor Semper taught practical construction, architecture, and plastic decoration. He and his students had an opportunity of showing their skill when they were charged to execute the ornamental metal work for the funeral car of the Duke of Wellington, which is now shown in the crypt of St. Paul's. Then there were other classes for teaching the principles and practice of ornamental art applied to surface decoration, including woven fabrics, paperstaining, embroidery and lace-making, porcelain, &c. These were conducted by the late Mr. Octavius Hudson, whose name as a nineteenth-century purist in Gothic decoration is associated with restorations at Lichfield, Ely, and the Lady Chapel of Chester Cathedral. But these classes for "technical instruction in art" have fallen into comparative desuetude. Perhaps the City Guilds' new Technical Institute may revive them. In any case, however, they are beside the immediate question of the technically instructive value of the collections at South Kensington.

This question may possibly attract a lion's share of attention next session from the Select Committees who propose to formulate the educational and technical functions of public collections generally. This possibility is all the more likely if a glance be taken over the numerous sections of which the South Kensington Museum is now composed. Its main buildings contain all sorts of works of fine art, paintings, sculptures, pottery, furniture, glass, textile fabrics, metal works, ivories, &c. In annexes are materials for building construction, models of machinery and of ships, a piscicultural collection, scientific instruments, educational apparatus, to say nothing of an immense department devoted to Indian art. This apparent complexity of collections is astonishing when disconnected from antecedent causes of its development. As a step towards elucidating its meaning, the collection of modern small arms and ordnance has recently been dispersed, a portion going to Birmingham and another to Sheffield. The collections of building construction, an intelligible evolution of the technical classes held under Professor Semper, are, it is reported, to be broken up. Besides these clearances, changes and developments are going forward in other parts of the Museum. The collections of works of art are undergoing re-arrangement. The old classification by materials and processes is being undone, and heterogeneous gatherings of works assumed to have been produced in various countries are taking its place. A museum of casts, for some years a dream of the Duke of Westminster and Lord Cowper, has been announced by Mr. Mundella to be in progress of formation. Special loan exhibitions of objects to show national phases of art are being organised; and throughout the country, and even abroad, all sorts of valuable, and perhaps unique, works of art are constantly peregrinating.

The functions of the Kensington Museum in circulating works of art have often been commented upon. They would appear sometimes to derange the normal collections which probably deserve a grant of fixity of tenure not to be impaired by perils of travel by land and by water. Hundreds of localities in the United Kingdom, awakening to the cry for artistic technical instruction, cannot be eager for the disintegration of a central normal collection. To a small extent, localities could supply themselves and be supplied with original works of art, and the hiatus in their collections could, no doubt, be filled with reproductions of typical famous works. From 1842 Government has acknowledged the value of making reproductions of works of art. It was felt to be as necessary in responding to the wants of provincial centres as to those of a normal central collection. National monuments in foreign countries were not purchasable. Even victorious conquerors could not transport Trajan's column, the Bayeux tapestry, Michelangelo's "David," or the Bhuddist gateways from Sanchi, without being reprobated for their acts of Vandalism in defying the spirit of modern right. Study of such works was none the less necessary for students. Copies were accordingly obtained of them and many others; and the system was ratified by a convention or agreement for assisting the making of copies, which was entered into by the Prince of Wales and the princes of the reigning houses of Europe in 1867. The copies, as obtained, took their places amongst original objects, and representative series of works in various materials were thus formed. This aspect of the utility of reproductions is now undergoing modification. The copies are no longer in the ranks of the general series of works. They are brought together by themselves and are destined to become the nucleus of a "Museum of Casts." The project of a museum of casts is adopted from cognate collections at Berlin and Munich. Its achievement will be advantageous to students of historical art, and will result in forming an adjunct to a museum of industrial fine art. It will, however, be independent of artistic technical collections for the instruction of producer and consumer. Points like these seem to fall within the scope of the inquiries of the Royal Commission now engaged upon furthering technical education.

Up to about 1876 the administration of the Kensington Museum had endeavoured to classify sections of objects in accordance with the principles enunciated in 1852. An unexampled collection of works of the potter's art was arranged: goldsmiths' and jewellers' works were placed together, carvings in wood and cabinetmakers' work formed another section, metal works another, textile fabrics another, and so on. The handicraftsman pursuing his industry in one or another of such divisions, could come to South Kensington and consult the works which belonged to his craft. From time to time there had been special exhibitions of works of various crafts. There had been one for cabinetmakers, a later one for embroiderers, another for jewellers, another for enamellers. During this year, a different series of exhibitions has been commenced. Spanish and Portuguese works were collected; and probably Scandinavian,

Italian, French, German, Russian, Chinese, and American collections may follow. The aim of these national exhibitions is apart from that of the preceding "craft" exhibitions. Their importance lies, in enabling connoisseurs and amateurs, as distinct from artisans and manufacturers, to discuss the nationality of art works. An ethnical interest is thus appealed to. For instance, in the Spanish and Portuguese exhibitions, there were splendid embroideries which Oriental travellers pronounced to be from Persia and Goa. Ornate plate was by some held to be Flemish. Finely-chased salvers, marked even with the Medicean "palle," were declared not to be Italian, ivory carvings were known to be French Gothic, and many delicate enamels, usually considered to be "Cellini" work, were placed in the Spanish collection, although labelled as being of French or Italian origin. Hence many inducements were offered for interesting controversy upon what could be the appreciable characteristics of "Iberian" art.

The theory that art is to be nationalised is gaining ground, and the arrangement of objects at South Kensington is being attempted in this direction. Its logical basis may be questioned by those who recall the dissemination of styles of art throughout Europe, which followed from the journeys of artists like San Gallo, Torrigiano, Cellini, Holbein, and many others. Into a large court have lately been brought sculptures in marble and stone, modelling in terra cotta, enamelled earthenware, furniture, plasterwork, metalwork, glass, &c., all considered to be of Italian work. As in the case of the reproductions and casts, technical arrangement showing crafts becomes superseded by "national" or "ethnical" arrangement. From this point of view the instructive purposes of the South Kensington Museum might be deemed to be entering a new phase. This new phase may be strange to foreign countries, who, struck with admiration of the original intention of the Kensington Museum, have been devising the establishment of "Industrial" museums for the artistic technical instruction of their artisans and manufacturers. As we write, the final arrangements are reported to be in progress for inaugurating at Berlin a German copy of our South Kensington Museum. This Berlin Museum is to be an Industrial Museum based upon what were the ruling principles of the South Kensington Museum before the present idea of converting it into a Museum of Ethnical Arts had taken root.

Our national collections, regarded as accumulations of materials for educational purposes, may be likened to the storage of facts possessed by a teacher. How they are to serve in special branches of instruction depends upon the teacher's treatment and presentation of them to the public. Study of archæology, ethnology, mineralogy, palæontology, ornithology, animal physiology, and technology, may each be advanced if the facts concerning them are kept in orderly and immutable arrangement, subservient to the particular branch of knowledge concerned. To aid the popular perception of such principle will, no doubt, be a chief object with the Select Committees next year. Museums should not, chameleon-like, be allowed to change their colours. The "circumspect explanation" of objects in public collections, and the definition of the precise *educational* purpose of each collection, are of public importance, and may be advantageously taken in hand.

THE SOIL AND ITS INFLUENCE ON HUMAN HEALTH.

At the recent meeting of the German Society of Natural Philosophers and Physicians at Saltzburg, the eminent Dr. Pettenkofer read a valuable paper on the subject of the influence of the soil upon human health. The subject, he said, was one of the oldest in sanitary science, but it possessed of necessity a permanent interest, as it was constantly presenting itself under new aspects. The soil, the air, and the water had been from time immemorial regarded as the principal factors in the problem of the salubrity of localities. It was these which made a place healthy or the reverse. In recent times there had, in Dr. Pettenkofer's opinion, been a tendency to look too exclusively to the air and water, and to neglect the influence of the soil in sanitary questions. But the ground on which men built their houses, and on which they passed their lives, must always take a pre-eminent place in the determination of all sanitary problems. Dr. Pettenkofer pointed out that air is almost invariably in motion. The average speed at which it moves over the ground at the earth's surface is about 10 ft. per second. Even in a so-called calm, the air is not still; it is still moving at the rate of about 1 ft. 6 in. per second. Hence, even in abysses, and the most secluded valleys of the country, or the narrowest lanes of cities, the air is never really stagnant. Nearly the same may be said with regard to water. All water as it falls from the clouds is of nearly homogeneous composition. It is but very slightly impure. From the soil, however, water, like air, takes up certain impurities. These are generally removed from the air much more quickly than from the water. The circulation of water and its purification from foreign elements are more complicated and less expeditious matters than in the case of air. Nevertheless the process of purifying water goes on even in the drains and sewers of cities, but more especially in the great natural drains, the rivers,—like the Isar, at Munich; the Elbe, at Dresden and Hamburg; the Thames, at Oxford and London; or the Seine, at Paris or Rouen. It was in the soil that impurities were most obstinately and longest retained. The influence of the soil showed itself most clearly in the case of epidemic diseases. Malaria has always been recognised as dependent on the soil of the localities where it is found. But it was not less true that cholera, typhus fever, yellow fever, perhaps even the plague itself, likewise depended on, or were connected with, the condition of the soil. What we have still to settle is the question, "How?" It has been attempted to explain the epidemic appearance of such diseases by assuming that they were propagated through the air or water, or both. But it is incorrect to regard either air or water as the true cause of epidemics. This is generally to be found in the soil. One proof of this Dr. Pettenkofer found in the fact that ships at sea were inaccessible to cholera. It had been observed that when persons were attacked by cholera on the high seas, only those who came from the same localities caught the disease, while the other passengers escaped. It was only exceptionally that the epidemic broke out on board a vessel, and then only when the passengers and crew were in frequent contact with an infected locality on shore. But even on land there were places safe against epidemics. Thus, Lyons, in the south of France, in spite of its large traffic with Paris and Marseilles, where cholera was raging, remained free from the disease. The only explanation that could be found was the condition of the soil or ground at the former city. Still more surprising was the immunity of Versailles from cholera, when Paris, with which it was in constant and immediate communication, was the scene of an outbreak of that epidemic. The investigations of the German Commission on Cholera have clearly shown that epidemics are localised, and that they are caused by the condition of the soil.

What is that, asked Dr. Pettenkofer, in the condition of the soil which is able to produce such an effect upon the health? He answered that probably it would be found in a vast number of minute infinitesimal organisms,—so minute that millions of them might, if collected, lie on the head of a pin. Dr. Nägeli has distinguished such organisms, and presented a faithful and vivid picture of them as they rise from time to time out of the ground. He makes a distinction between soil that is pestilential or unhealthy, and soil that is healthy or free from pestilence. This distinction does not coincide with the presence or absence of a certain kind of fungus, as this is found growing everywhere. However, if the disease is attributable to the same species of fungus generally found growing in every place, then the same forms of these little organisms must produce different effects under different circumstances. It is the task of hygienic science to examine the conditions of the soil favourable to the development of these organisms and their entrance into the human system. It has long been known that by means of drainage and cultivation or tillage an injurious unhealthy soil, like that of the malaria districts, may be deprived of its dangerous character. Even in ancient times canals were cut by the Romans in order, by drainage, to reduce the evil effects of the malaria, though these works had subsequently been destroyed and forgotten. Certain diseases have their favourite haunts in alluvial soil on account of the porous nature of that soil. The spaces and interstices of this soil favour the circulation of air and water. But the same may, to a certain extent, be said of some kinds of porous rock, as is proved by the appearance of cholera in rocky places like Malta. Exact investigations respecting the air in soils have shown its importance from a sanitary point of view. On thoroughly dry soils the ground-air does not absorb any more carbonic acid or organic matter than the air above the ground. This has been shown by experiments with the air brought by Dr. Zittel from the Libyan Desert. The subterraneous or underground air circulates in the soil, although but slowly. During the greater part of the year it penetrates into badly-built dwellings, and conveys into them the fungous germs of disease. In this manner the soil influences human health, and there are only too many dwellings subject to this influence, which is the more baneful the worse they are ventilated. Our houses, in fact, draw or suck the air out of the ground like so many cupping glasses. From a hygienic point of view they are, indeed, less rational than the old pile dwellings of primeval humanity, or than even the village cottages of the present day, whose floors are covered with mud plaster. This was illustrated in the case of an outbreak of cholera at Dantzic, where out of a group of nine cottages, seven modern-built ones, with cellars and plank floors, were visited by the epidemic, while the only two with mud plaster escaped. Accordingly, it appears that in our houses we must pay more attention to the soil on which they are built. Such arrangements should be made in their construction that we should no longer be compelled to take to flight when an epidemic breaks out. A proper method of sanitary construction would enable us to withstand successfully a siege, so to speak, by the cholera, in which case it could be said with greater truth than ever that "a man's house is his castle." Dr. Pettenkofer regards it as the duty of Governments to take the initiative in this matter. Not less important than the air is the water. All organisms require moisture. There are two degrees of moisture to be distinguished: first, that in which the pores of the soil are occupied by air and water in common; and, secondly, that in which the water has entirely driven out the air. In the first case, we have a damp soil; in the second, we have underground water. The intimate connexion between typhoidal diseases and the underground water has been long recognised. When underground water rises higher than the average, typhus disappears, but when again the water in question sinks below its average level, typhus increases. This had been shown clearly by observations made in Berlin. Any apparent exceptions such as places visited by typhus, though without underground water, yet having a porous soil, or again the unimportance of the level of underground water near rivers, did not invalidate the argument. As, amongst us in Europe, the abdominal typhus fever depends on the rainfall and the level of the underground water, so in India does the cholera depend precisely upon the like causes.

With regard to the theory attributing cholera, typhus, and all zymotic diseases mainly to the water we drink, Dr. Pettenkofer advanced some arguments against its unconditional acceptance. The malaria poison, for instance, does not enter the water. The *baccillus malariæ* has been proved to be an organism living in the air, not in the water, of the infected districts, and it was from the air that they penetrated into the human system, and ultimately into the blood. The real cholera germ has not yet been accurately ascertained or identified. It is still doubtful whether it is disseminated more by water than by air. The drinking-water of places visited by cholera has often been entirely given up without preventing the re-appearance or continuance of the epidemic. The city of Basle, for instance, possesses the purest drinking-water which is brought down from the Jura, but has not been protected by it from the disease. Dr. Pettenkofer, however, would not question the importance of the water we drink, in regard to this question. Far from denying the value of good waterworks, the speaker dwelt on the importance of pure drinking-water. The *bacteria* question, too, was one of the highest importance, but the theoretical deductions on that subject required to be practically employed and confirmed by practical experiments. To the observations of a Pasteur there needed to be added the practical applications of a Lister, in order to make them of value in sanitary or surgical science, and in the same way mykological investigations would require to be completed by

hygienic researches. It had been observed that in the case of very concentrated and very diluted fluids used as nutriment, the very small organisms usually found in those fluids in their normal condition are destroyed. An inference drawn from this, that dirt is no danger to health provided it be only thoroughly concentrated dirt, could not be admitted. In villages the dirt is not stronger or more genuine dirt than in towns. In the latter it is only covered up more, and, therefore, the more dangerous. In villages, too, the more cleanly dwellings were the healthier. But granting that concentrated dirt may hinder fungous vegetation, there still remains for hygienic science the task of ascertaining what must be the proper degree of this concentration, and to consider the conditions favourable to the injurious vegetation in question. Sanitary science was, in fact, one unceasing battle against dirt. As the growth of these minute fungi is increased by moisture, it might be thought that all would be right if everything were kept from the damp. However, we are not able to prevent everything from becoming damp or to prevent the dissemination of germs in a thousand different ways. It is in any case good to avoid or to draw off moisture. Dr. Pettenkofer strongly condemned the use of ground reservoirs for rain-water and other such pits, as they contribute to keep the soil thoroughly moist, and are thus very injurious in the neighbourhood of dwelling-houses. They serve, in fact, precisely like a sort of artificial inundation.

The doing away with the moisture or dampness of soils, or at least the diminution of damp, is the main advantage of the various systems of drainage. The value of drains might be exaggerated, but we must beware of underestimating them. Statistics prove that every city which has laid down a system of drainage has greatly benefited thereby. Further, Dr. Pettenkofer referred to the self-cleansing process going on in the soil through the agency of certain very low organisms. The formation of saltpetre through certain fungous growths, shows that these minutiæ are capable of acting not only injuriously, but also beneficially. Hygienic science, at the present moment, stands in view of a practically boundless world of possibilities. But this must not discourage us from action. Hitherto hygienic science has been guided chiefly by feeling, instinct, and so-called commonsense; it is only recently that it has been established on a scientific basis. Cleanliness plays in public life an important part. Cleanly persons live longer and more healthily than the dirty. We ought to respect the sanitary system in common use, even though it still lacks a scientific foundation. But scientific criticism is necessary to refute false ideas, and to get rid of what is superfluous and hurtful. In conclusion, the speaker said that the advancement of sanitary and hygienic science, both in theory and practice, was one of the most important duties of the State.

SOME ASPECTS OF HERTFORDSHIRE.

THE very fact that Hertfordshire is so close to London helps to make it different from other counties, for it is the immense contrast between a very rural county, such as this, and an enormous metropolis within half an hour by rail, that furnishes it with a noticeable characteristic, that is to say, its metropolitan but thoroughly rural nature. For there are few counties in England in which, as a whole, there is a larger proportion of woodland, or which are more thickly wooded. From Hatfield to Hertford, for example, the eye is struck with the continual woods, and with roads and lanes overshadowed by innumerable well-grown oaks. Equally also the picturesqueness of the villages, the many cosy red-brick old-fashioned houses, half hidden by clematis and roses, which are to be found throughout the county, help to make the contrast more marked in the mind of any one who, a short time before, has left the metropolis, between this rural county and the great town which is so near. But whilst this is one of the general aspects of this county, it is one which, while it will strike an intelligent man who may or may not be an architect, yet is not that aspect of it which principally makes Hertfordshire, as a county, of very considerable interest to the architect, and especially the young architect. For Hertfordshire is, if we may coin a phrase, essentially a "residential county." It is quite astonishing to see the number of gentlemen's residences which are passed mile after mile,—not lordly palaces, such as Hatfield, which, we need not point out, is a unique and an historical palace, but fair-sized "mansions," standing in well-kept and bright gardens, in small parks, or in park-like land. If a young architect were to start from Tring in the west, and go directly pretty nearly through the middle of the county to Sawbridgeworth in the east, he would see more examples of what may fairly be described as averaged-sized gentlemen's houses than in any other county in England. As we have already said, we exclude from this the great and noticeable house of Hatfield, which all young architects should visit, and even great but lesser houses, such as Panshanger, looking down from its trees over the green slopes and shining Maran as it sweeps beneath the dark green oaks or broadens into the quiet lake reflecting the overhanging trees and the stately swans, or Knebworth with its twelve fantastic vanes. *Apropos* of this house there is a story that the late Lord Lytton used to delight to take his guests outside the house and ask them to count the weathercocks, and when they could only make the number twelve, he would add that there were thirteen, and that the thirteenth was himself. But the number of the average houses, and the singular fitness of the country, with its wooded knolls, its grassy slopes, and its abruptly undulating nature for residences, will make a journey through Hertfordshire a very profitable one to an architect who goes with his eyes and mind well open. He will see much that he may usefully imitate, and much also that will show him what to avoid; he will see many instances of good, and not a few examples of bad taste in building. He will notice houses placed on spots which there can be no question should have been avoided, and others placed with excellent effects, both as regards picturesqueness and health. Here is a handsome house put right at the bottom of a slope, where, if a fog is to be found, it will certainly exist, without a view, and which cannot be reached without a rapid descent, nor left without a tedious ascent. On the other hand, he will see a similar house placed just below the topmost swell of the hill, which shelters it from the winter winds with a garden beginning the slope, which broadens out into a smooth green descent studded with well-shaped trees, which in its turn draws the eye to the lower slopes, and the misty distance. He will notice one house with a northern aspect, as if the owner, and all who came after him, were disciples of the late Canon Kingsley, and desired to get each blast of the cold winds, and not the gleams of sunlight which make a southern aspect so precious in the winter season, and, indeed, for the greater part of the year in this not too warm land of ours. These are some of the points which will strike the architect who wanders through Hertfordshire, but even where there does not happen to be a house situated, there are so many spots on which a house might well be placed that the county affords, as it were, lessons in the placing of houses which, if carefully taken to heart, can scarcely fail to be of value when the architect has to advise on the situation of a house in a neighbourhood less fitted for houses than Hertfordshire, because the eye, getting familiarised with what auctioneers term "eligible sites," at once picks out the best position when a spot has to be fixed upon in some other part of England.

Equally also the number of the houses makes it possible to notice secondary matters, or rather matters of detail, so to speak, such as the position of stables, one of the most difficult points in regard to country-houses; for it is so common to find the stables too close, or, on the other hand, too far, and the means by which they shall be at once handy to, and yet removed from, the house, is often a difficult practical point. Again, few men wish to spend a large sum on the decorative effect of stables, and yet no man of taste wishes his stables either to be out of keeping with the house of which they form a part, or so absolutely without beauty and architectural fitness as to be positively an eyesore. Thus passing from one house to another in Hertfordshire, lessons can scarcely fail to be learned in regard to this eminently practical point which so often gives no little trouble to both architect and owner. In the same way Hertfordshire affords an easy study of lodges and gardeners' cottages, which, again, are buildings in erecting which economy and harmony generally have to be united. These are all matters which affect the architect very seriously, professionally, and may do much to make or mar the beauty of our English homes. When, therefore, we get a county so rich in natural beauty, and a beauty of a peculiarly English character,—one, too, essentially very fitted to the habits and the desires of the man of means, or of the country gentleman of the present day, who makes his home in the country—so near to London, so easy of access and study, so well covered with houses, from an ancient palace of the Tudors to the modern dwelling-house of the Australian merchant,—it may fairly be said that Hertfordshire is most interesting to all architects, and especially to those who are at the beginning of their career.

TYPHOID EPIDEMIC IN LONDON, AND A PROPOSAL FOR A GRAPHIC INDICATION OF ITS LOCALITY.

THE *Lancet* calls attention to the fact that a severe epidemic of enteric fever is prevailing in London. In the week ending the 22nd of October there were fifty-three fatal cases, or thirty above the corrected average. The general hospitals contain an unusually large number of cases, and at some of the hospitals many applicants have been turned away. The fever is of an unusually virulent type. We call upon all such friends of sanitary reform as may be able to contribute any information, to give their attention to the subject of a monthly Disease Map of London. It would be easy to construct such a map, if reports were drawn up at the hospitals, dividing the patients, under each head of disease, according to the locality from which they come. It would then at once become evident whether any epidemic of the kind were local or general. If it proves that the cases are equally distributed over the area of London, it will be evident that it is by attention to the general rules of health that the danger is best to be met. But if it prove that certain localities are most affected, an indication of the utmost sanitary value will be afforded. The block map on which the monthly states are laid down should distinguish the districts of the different water companies, and also those of the different principal sewers by which the area is drained. Thus, when the Homerton district is indicated as containing numerous cases, the first remark is that the water is supplied to it by the East London Water Company, the second that it is drained by the Hackney Wick Branch sewer. Furnished with this guide, the observer who has the localities of the different cases attacked to mark on his map will be at once enabled to see whether it is to the water supply or to the drainage that he is to look for the immediate causes that aggravate the epidemic. If it should prove that the Kingsland-road forms a boundary east of which fever is manifestly more prevalent than westward of that line, a significant suggestion for inquiry will be given as to the effect of the use of the river Lea water. If the depression and outfall line which runs southwards from Upper Clapton to the north loop of the Thames near Poplar, prove to be the axis of the densest part of the map, it will show that the Metropolitan drainage system has to be overhauled. If the cases follow the run of the river, the effect of the wholesale pollution effected by the present arrangements may become evident. In such a case it would be worse than idle to express any anticipation, except one, and that is, that the information which such a map would afford at a glance would be of the utmost sanitary value.

If nothing points to district causes of disease, such as those arising from bad water, bad drainage, bad milk, or overcrowding, the need will be only the more apparent to seek for and root out such nests of fever as have been recently identified in Marylebone, for example, by a coroner's inquest, held on the 27th ult. The facts put in evidence at that inquest are of a distressing nature. Not only so, they are of a nature very alarming for the vicinity. However charitable any locality, or any class of society, may be, there can be no doubt that at the same time a stimulus to charity and a guide to the directions in which it may be most usefully applied would be given by such maps as we suggest. A certain number of fever cases coming from a certain locality would at once direct attention to that locality, if the cases were graphically referred to their proper districts. The aid of the local medical officers of health would be invoked, and the map would thus be completed, not from hospital returns alone, but

from all that comes within the purview of the Registrar-General. And when those persons who are unconsciously living in danger of infection from neglected neighbourhoods, or from the hopeless misery of silent poverty, had it once brought plainly before their eyes what was the sanitary state of their neighbourhood, the very instinct of self-preservation would be awakened, and the local medical men would be likely to obtain an aid to their disinterested exertions that would prove of the utmost value, both in relieving misery and in preventing the incubation, spread, and seeding of infectious diseases.

The idea of a disease-map, as our readers may be aware, is not new. Some years back we called attention to the great value of the scheme when introduced by a medical officer of the navy; but these maps regarded the normal distribution of diseases in the country. They showed, for instance, how consumption haunts wet subsoils; how rheumatism lingers in mountain valleys and in the hollows of the chalk uplands; how certain localities are favourable and others unfavourable to heart-disease. We do not undervalue this study. On the contrary, we think it is one that should occupy a large space in the attention of every medical man.

But what we now suggest is of a different nature, although quite in harmony with existing disease-maps. The difference in the two cases is such as that which exists between a general statement of average barometric readings over a given country, and a daily or weekly statement of barometric readings in each given locality. Our disease-map would resemble the latter. Its value would be double. First, it would be a guide to the expert; secondly, it would be a warning to the inexpert. To the first it would show where to set to work in order to insure safety; to the second it would furnish a strong incentive to give substantial aid to such work.

THE LONDON FISH-MARKETS QUESTION.

After a debate lasting nearly five hours, on the 28th ult. the Metropolitan Board of Works, by a very narrow majority, has sought to shelve the question relegated to it by the Home Secretary,—at any rate, for the present,—for by adherence to the decision unexpectedly arrived at the Board would preclude itself from taking the necessary steps to promote a Bill in the next session of Parliament which should confer upon it the necessary powers to erect a fish-market or markets, although by a resolution arrived at more than three months ago, they unanimously pledged themselves to this course. Those who listened to the debate could not but be struck by the persistent manner in which the majority of the members, while (with one or two exceptions) admitting the necessity of something being done, contended for the adoption of sites in localities with which they happened to be more particularly connected. They did not take a broad view of the wants of the metropolis as a whole. It was alleged by the opponents of the particular site recommended for adoption by the Works Committee (*i.e.*, the site in Blackfriars-road), that its selection had been precipitately determined upon in order that the Board might be able to go to Parliament and score a victory against the Corporation, and we fear that this charge is not altogether baseless; for, whilst some of the speakers disclaimed any desire to "disestablish and dis-market Billingsgate," there were others who boldly ennunciated the view that they hoped the action of the Board *would* do away with the old market altogether, on account of its smallness of area and the difficulty of approaching it. The speakers who were against the adoption of the Committee's report, in support of their view that the recommendation contained in that report was hastily arrived at, and therefore ill-considered, urged that the fact of the Board's selection of one site after another was a proof of indecision. One of the speakers, who advocated the erection of a fish-market in York-road, King's Cross, sought to show that this point was the centre of the metropolis, and he tried to convince the Board that his knowledge of the topography of London was exact by the simple expedient of drawing on the map a circle radiating from King's Cross as a centre! In this way it would be easy to show Hyde Park Corner, or the spot whereon once stood Mile-End Gate, to be the centre of London. The same gentleman, arguing against the Blackfriars-road site,—not only because it was not, in his opinion, sufficiently central, but because the direct railway route to it was through the heart of London, *viâ* the Underground Railway from King's-cross to Farringdon-street and Snow-hill, and thence by the London, Chatham, and Dover line *viâ* Ludgate-hill and Blackfriars,—spoke of the deleterious effect upon the fish of the air of the underground railway; but seeing that the transit of the fish-trains underneath London would take place mostly in the early hours of the morning, and that their passage from King's-cross to Lodgate-hill would occupy not more than ten minutes, and remembering that fish-trains from a distance have to pass through longer lengths of tunnel on some lines, there does not appear to be much in that argument. The same must be said as to the difficulty which the speaker conjured up of fish-trains being unable to reach the proposed market in Blackfriars-road owing to their inability to ascend the steep incline between Snow-hill and Ludgate-hill stations. It is true that the gradient referred to is a heavy one, but nevertheless, heavier goods than fish, viz., coals, are hauled up it, on their way south, by thousands of tons every week,—to an extent, indeed, only limited by the exigencies of the passenger and mixed goods traffic. The several companies having running powers over this bit of line "shove through," in the words of one of the station officials, as much coal as ever they can, and would "shove through" more if they could. A point that might well have been taken against the proposed market in Blackfriars-road, if it had depended for its railway service entirely on the railway *viâ* Farringdon-street and Ludgate-hill, is the already exceedingly-congested state of the traffic on the line; but, as a matter of fact, *détours* to the west and south-west, *viâ* Kensington and Clapham Junction, and to the east and south-east, *viâ* the Thames Tunnel and New Cross, would enable fish-trains coming from the north or north-east to reach the Chatham and Dover line south of Blackfriars Station without passing through the City at all. It was the primary object of the supporters of the Blackfriars-road site to erect there a market which should mainly, if not entirely, receive the railway-borne fish entering the metropolis. Indeed, the site, being to the south of Southwark-street, has no river frontage, although, it was suggested, a wharf for the landing of water-borne fish might be established in the neighbourhood of the railway bridge, and the fish there landed conveyed into the market. Now the evidence of fishermen, smack-owners, salesmen, and others is unanimous in at least one point, and that is, that the railway companies' charges for the conveyance of fish are so great that what is called the "offal" fish,—*i.e.*, the fish which is most abundant, and therefore most within the means of the poor to purchase, if it could only be got to London in sufficient quantities,—will not bear the heavy cost of railway carriage, and so, we learn that, although the "harvest of the sea" is abundant, hundreds of tons of sprats, herrings, &c., can be put to no other use, when caught, than to manure farm lands. In view of this fact, it was very well pointed out by some of the members of the Board that whatever market might be established for the reception of railway-borne fish, it was eminently desirable to provide new, or at any rate to preserve existing, market accommodation for water-borne fish, and to encourage the growth of the traffic in such fish, in order to compete with the railway companies, and so, possibly, induce them to lower their rates of carriage for this important article of food. "A railway manager," said one of the speakers, "is a man without a conscience," and for this reason it was urged that whatever was done the Board should give no encouragement to railway monopolies. Another speaker put this case:—Assuming a new market for railway-borne fish to be established in Blackfriars-road, and that Billingsgate, enlarged and with improved approaches, would receive the water-borne fish, would not the retail fishmonger carrying on business, say, at Kensington or Bayswater, be under the necessity, in order that he might buy in the most advantageous market, of visiting first Blackfriars-road and then Billingsgate, or *vice-versâ*, to his great loss of time and the increase of the traffic over the bridges? Answering this question in the affirmative, the speaker proceeded to argue in favour of a market which should be capable of receiving both the rail-borne and water-borne fish, and such a site, he pointed out, was the one at Bankside. Doubts were expressed whether the proposed market, or any new market, wherever placed, would be a success, for it was truly said it is much easier to erect a building for a market than to create a market itself in a new locality. Columbia Market was instanced as an illustration of this. Many side issues and details not affecting the main question were incidentally raised, and one of them was whether, in the proposed market, it was advisable to have retail shops. Retail shops in a city market, said the member who has been quoted as having no very high opinion of railway managers, were vestiges of the time when Materfamilias lived in town and used to do her own marketing. The City had ceased to be a place of residence, and had become "the mere battle-field of avarice."

The whole question, as is evidenced by the able reports of the Engineer and the Superintending Architect of the Board, is one demanding great care in the attempt at a solution. The matter is again to come before the Board, but it must not be forgotten that it is still under consideration by the Corporation of London, who may possibly take such steps in the near future as to greatly diminish, if it does not entirely remove, the necessity for the Board's taking further action in the matter. Should this be the result of the "late-present" agitation on the subject, it will be, as was hinted during the debate, a tribute to the astuteness of the Home Secretary in using the Metropolitan Board of Works as a lever to move the Corporation of London.

Shortly stated, the course of the debate, of which we have reviewed the leading incidents, was this:—The Works and General Purposes Committee presented a report, in which, after weighing the merits and demerits of various proposed sites, they recommended the Board to approve of the site in Blackfriars-road suggested by the Engineer and Architect, and to apply to Parliament in the next session for power to acquire that site for the purposes of a fish-market. This site, about six acres and a half in area, is traversed from north to south by the London, Chatham, and Dover Railway, and has its main frontage to the east side of Blackfriars-road (extending from Southwark-street to York-street). It is estimated to cost 530,000*l.* to acquire. The erection of the market buildings, and the necessary arrangements for the bringing the fish-trains into the market, are estimated to cost 300,000*l.*, so that very nearly a million of money would be required to carry out the scheme. The chairman of the committee moved the adoption of the report, whereupon an amendment was moved to acquire a site in York-road, King's-cross. This amendment was duly seconded, and after a long discussion, a show of hands was taken, when the amendment was rejected by 25 votes against it to 4 for it. Another member then moved, as a rider to the original motion, "That the Board do also provide a site at Shadwell for a fish-market, and that the Board apply to Parliament for powers to make a waterside fish-market on the site referred to." This proposed addeudum was rejected by 18 votes to 9 on a show of hands, and by 21 to 9 on a division. On the original motion, for the adoption of the report of the committee, being put to a show of hands, there appeared: For the report 17, against it 16, showing a majority of one in its favour. A division being demanded, this state of things was exactly reversed, for while 16 members voted for the adoption of the report, 17 voted against it, showing a majority of one against the motion, which was consequently negatived.

The Sanitary Assurance Association.—At the ordinary meeting of the Council of the Sanitary Assurance Association, held at the offices, 5, Argyll-place, Regent-street, Oct. 26th, Professor Hayter Lewis, F.S.A., in the chair, certificates were issued under the corporate seal of the Association to those subscribers who had carried out the recommendations of the Association with regard to the sanitary arrangements of their houses. These certificates are signed by the chief sanitary officer of the Association, Professor Corfield, M.D., and the surveyor, Mr. Mark H. Judge, and they guarantee the satisfactory condition of the houses to which they refer, the inspection, report, and supervision of the work where alterations are necessary being made personally by both officers. The certificates are issued subject to an annual inspection of the property, for which the members are charged a small fee.

THE OPENING *CONVERSAZIONE* OF THE ARCHITECTURAL ASSOCIATION.

The fortieth session of the Architectural Association was opened on Friday evening, the 28th ult., with the usual *conversazione*, the number of ladies and gentlemen present being, apparently, greater than ever. The large galleries on the ground-floor have become utterly inadequate to the needs of this annual gathering, and but for the courtesy shown by the Council of the Royal Institute of British Architects in placing their rooms at the disposal of the Association, the *conversazione* would have to be held elsewhere. As it was, the whole of the galleries and rooms were somewhat inconveniently crowded, though the Entertainments Sub-Committee this year wisely provided musical entertainment upstairs as well as downstairs. In the large gallery, Messrs. Coote & Tinney's band went through a well-selected programme with much credit, whilst in the Institute meeting-room, after the speech-making was concluded, some part-songs and glees were well rendered by the Artists' Rifle Volunteers Musical Society, conducted by Lieut. W. H. Thomas. There was a large and varied display of architectural drawings, oil and water-colour paintings, and objects of art manufacture. In the Institute Library, there were displayed a number of delicately-executed pencil sketches of Italian buildings, by Mr. F. Baggallay; a series of charming water-colour drawings by Mr. F. C. Penrose; and some of the excellent photographs (chiefly of old-fashioned inn-yards in Southwark) issued by the Society for Photographing Relics of Old London. In this apartment, too, were on view a number of panels in Japanese lacquer-work, lent by Messrs. Levy Bros.; and a case containing specimens of the manufactures of the Venice and Murano Glass and Mosaic Company. These included reproductions of Roman Murrhine and vitreous pastes, imitating agates, jacinth, sapphires, &c., and a specimen of modern Muranese "Soffiati," after an example in the Municipal Museum at Murano. The walls of the Institute meeting-room were covered with the drawings and sketches made by the Architectural Association's first Travelling Student (Mr. H. H. Kemp), and the drawings which had obtained the other prizes offered by or through the Association. Mr. Kemp's drawings and sketches well merited the encomium bestowed upon them by the President, and, indeed, the draughtsmanship exhibited in all, or nearly all, the sheets displayed on the walls of this room was, as Professor Kerr remarked, of a high order of excellence. In the large gallery downstairs a series of cartoons for wall decorations, designed by Mr. H. Walter Lonsdale for Messrs. W. B. Simpson & Sons, was exhibited, as well as a number of oil and water-colour paintings. Foremost amongst the water-colours, both in number and excellence, were those by Messrs. R. Phené Spiers and Aston Webb. The architectural drawings shown in this gallery included two frames containing measured drawings, by Mr. Sydney Vacher, of Lusignan Cathedral, Famagosta, in the island of Cyprus. Mr. Vacher also lent some specimens of Persian armour. Messrs. Doulton & Co. lent a fine collection of Lambeth art pottery, and close by were a couple of medallions in mosaic work, lent by Mr. F. Garrard, of Millwall. Messrs. Shuffrey & Co. exhibited a stove and mantel, and a well-designed wall-paper; and the Gateshead Stained Glass Company showed some ornamental glass vessels. Messrs. Liberty & Co. exhibited, among other things, some India matting and an Indian embroidered coverlet. Messrs. Gillow & Co. sent some good cabinets, and a panel of gold tissue (modern French) embroidered with a subject after Jean Goujon. The Art Furnishers' Alliance made a large display of cabinets and other articles, some of them designed by Dr. Dresser. Messrs. Gregory & Co. exhibited cabinet-work and some Turcoman curtains. In the smaller gallery were some cartoons for stained glass by Mr. H. W. Lonsdale, the subjects being selected from "As you like it" and "The Merry Wives of Windsor." Here were also shown a number of sketches (by Mr. W. H. Lynn, R.H.A., and several other gentlemen), of buildings seen during the Association's excursion to Worcester in August last, besides an excellent series of photographs of the same buildings taken by Mr. J. H. Robinson, architect, Dublin. Mr. J. D. Crace lent two or three water-colour drawings, including a study of the beautiful ceiling decoration of the Scuola di San Rocco, Venice. Miss C. H. Spiers and Miss Welby contributed some well-executed water-colour sketches of flowers. Messrs. Morant & Co. lent some fine specimens of Venetian and Cordovan wall-leathers, including one from the Palace of the Popes at Avignon, painted by Joseph Vernet. Messrs. Jeffrey & Co. showed specimens of stamped leather and wall-papers, designed by Mr. Walter Crane, together with some original designs by Mr. Crane and other artists.

About nine o'clock Mr. Aston Webb, the President, took the chair, and proceeded to present the books and other prizes gained by the members of the Association during the past session. To the winner of the Architectural Association *Travelling Studentship* (Mr. H. H. Kemp) he presented the Bronze Medal of the Association and a cheque for 20*l*. The second prize (a bronze medal and two guineas) in this competition was taken by Mr. F. G. Hooper; and the third prize (a bronze medal) to Mr. W. A. Pite. The *Essay Prize* went to Mr. A. T. Ellison. The *Architectural Union Company's Prizes*, for the two best series of measured drawings of existing buildings in England, or of portions of buildings, erected previously to the eighteenth century, were awarded as follows,—First (5*l*.) to Mr. Edward Dawber, for his drawings of Red Mount, King's Lynn; second (2*l*. 10*s*.) to Mr. A. Hemingway, for his drawings of Furness Abbey. The *Class of Design Prizes*, for the two best series of sketches submitted in the class during the session, were awarded: First (3*l*. 3*s*.), to Mr. W. J. H. Leverton; second (2*l*. 2*s*.), to Mr. G. W. Ward. In this competition, the work done by Mr. E. D. Pickford, of Weymouth, received "honourable mention." In the *Class of Construction*, the first prize (3*l*. 3*s*.), for the best series of studies submitted during the session, was taken by Mr. W. A. Powell, and the second prize by Mr. W. J. Lander, Mr. C. Dunch's work being accorded "honourable mention." In the *Elementary Class of Design*, Mr. Lander and Mr. Dunch were bracketed as equal for the first prize. The *Colour Decoration Class* prize (3*l*. 3*s*.) was carried off by Mr. J. H. Ince. The *Association's (Silver) Medal*, offered for the best design for a middle-class school for 250 boys, was not awarded, the judges not considering any of the sets of drawings submitted to be sufficiently up to the standard.

The distribution of prizes being concluded,

The President delivered a brief address, in the course of which,—after thanking the ladies for their presence and encouragement, and the Council of the Royal Institute of British Architects for the use of their rooms,—he shortly reviewed the progress of the Association during the past session, which he was pleased to be able to say had been satisfactory in almost every way. The last session would be especially remembered from the fact that during its progress the first studentship ever attached to it was founded. The intention of founding it was mentioned by his predecessor, Mr. Ernest C. Lee, at the opening *conversazione* last year. The suggestion was Mr. Lee's own, and he set to work with great energy to accomplish this object, and, being heartily supported by the subscriptions of past and present members, in a very short time the sum of nearly 700*l*. was promised, and the success of the fund was assured. Before the session was over, Mr. Lee had the satisfaction of awarding the first Architectural Association Travelling Studentship to Mr. H. H. Kemp, upon the result of whose trip, as displayed in the sketches exhibited on the walls, Mr. Lee, the subscribers, and the Association were to be congratulated, and especially so because Mr. Kemp's sketches had set before future holders of the Studentship a very high standard of excellence. The classes of the Association had been well attended during the past session, and their prizes well competed for, though the open prizes had been poorly contested,—an experience shared by other societies. Mr. Webb went on to say:—The briefest notice of last session could not omit the mention of one who very suddenly passed away during its course, and who was a great friend to our work,—the late Mr. William Burges. We were all looking forward to a paper which he had promised on Queen Anne architecture, when he died in the midst of his work,—but recently elected to the Royal Academy, and leaving to young men, above all things, an example of strict integrity and a high standard of honour in his profession, doing all the work he undertook with great thoroughness, and with his whole might. But a new session is now upon us, and we have had to look forward and consider how, with our increasing numbers, we can best increase the usefulness of this Association and meet the enlarged demands which are year by year made upon it. Mr. J. D. Mathews, our treasurer, has suggested a series of lectures which should, in conjunction with our classes, be so arranged as to afford assistance to such of our members as may intend to present themselves for the compulsory Examination about to come into force under the auspices of the Royal Institute of British Architects. This suggestion, I am glad to say, received the support of, amongst others, Professor Roger Smith, and the desirability of these compulsory examinations having been decided on by our representative professional body, we have determined to do as much as is in our power to conduce to their success, though, as a matter of detail, I venture to think that the postponement of the first examination from next Spring to next Autumn would be advantageous. We are well aware that these lectures are a departure, and a very important departure, from the system of mutual help and instruction on which the Association has hitherto been worked, but we, like all other foundations, must, if we are to continue our usefulness, conform to the altered conditions and requirements of the times. The Committee think they may be congratulated on securing the services, as lecturers, of two men so able and so well known in the Association as Mr. Blashill and Mr. Tarver. But when all this has been done, the student must not think that the Association can provide him with all the education, in conjunction with his office work, that he will require. This is not so. He will have still to avail himself, in addition, of some of the many other opportunities and instruction that are now open to architectural students in London, viz., the Architectural School at the Royal Academy, with Mr. R. Phené Spiers as master, and the very valuable Academy lectures; the lectures at University and King's Colleges; the South Kensington Museum Reading-room; the Architectural Museum; the Institute Library, &c. All these are open to the student, who was probably never so well supplied with means of improvement as at present. Still, there is a lack of completeness and cohesion amongst these means of education which I think somewhat detracts from their general usefulness, and a strong head is wanted to gather up the threads and work them into a comprehensive scheme whereby our present somewhat driftless education may be more systematised and the various opportunities open to the student be made, as a whole, more accessible to him. The Architectural Museum, for instance, containing, as it does, an invaluable collection of casts, languishes sadly in Tufton-street, whereas in a position more accessible to us here, its usefulness might be largely increased, to the mutual advantage of the Museum and ourselves. Some day, perhaps, we may see a united attempt made towards the foundation of an architectural college, where our societies may be properly housed, and where our students, assisted by our own professors, could pass through a course of systematic study, say for two years, proceeding then to an architect's office, and finishing up with a one or two years' trip on the Continent previously to entering on the real business of life. But these are only dreams, I am afraid, and a long way at present from fulfilment. Turning to matters of more general architectural interest, we naturally, at the commencement of a new architectural year, ask ourselves what we are now aiming at and working for: what development we have made, and how far we have advanced towards the attainment of a style distinctive of our own day. A new style seems like the philosopher's stone,—hard to find, and it is doubtful if ever it can be found, while some go so far as to think that if we found it we should not like it. The leading academical styles, as I may call them, are largely discarded for the moment in favour of a style with principles not yet formulated and capabilities not fully tested, and therefore not easily learned or taught; and the want of a certain directness of aim under these circumstances is, and indeed must be, noticeable, together with a certain lack of enthusiasm compared with even ten years ago; and it is to be hoped that the increasing attention that has most properly been paid to sanitary matters is not to be given at the expense of the architect's first work, design. For the last fifty or sixty years English architecture seems to have been going through

a course of archæological studies, taken, curiously enough, in something like their original natural progression, but with that progression accelerated a hundred-fold. Some, perhaps, amongst my professional hearers, may remember when the influence of Stuart & Revett was still felt, and Grecian was thought to be the only true architecture. They may remember how since their youth they have been hurried on from Greek to Roman or a freer Classic style, through all the turmoil of the various stages of the great Gothic revival; then introduced to a glimpse of the dainty conceits of "Queen Anne," and even "Georgian"; and finally have found themselves somewhat bewildered and out of breath as they wonder whether, having been brought up to this point, they are going to be carried on still further and brought face-to-face with a real Victorian style, or whether, having come to the brink, as it were, they shall turn back and begin the long round again. This is a question which the young architects of the day (many of whom are members of this Association) will have to answer, and on their diligence, enthusiasm, and imagination the answer must depend. We appear now to have revived all the styles without succeeding in doing more than to revive them. We have hardly revivified them or advanced them much beyond the point at which they were left by their originators. Indeed, we may almost say that the Italians are the only people who have ever succeeded in doing this; but art in those days was part of the life of the people. There was a living interest in it among all classes, and all were able more or less to appreciate and criticise it. A great artist (architect, painter, or sculptor) was held to have conferred, by his works, as much honour and benefit on his country as the bravest soldier or the most successful statesman. From the way, therefore, in which these various styles have been revived and in turn discarded, we seem drawn to the conclusion that they were each brought to the highest perfection possible before they were abandoned by the old men themselves. Now we have reached a further stage, when all the various epochs of architectural design have been in turn tried, and in some sense found wanting; and now, if ever, a departure must be made. But should this departure be made, it will depend for its life as much on the intelligent interest and support of the general public as on all the energy of our own profession, though the two must go hand in hand to ensure success. In all arts subsidiary to architecture, there has long been an increasing general interest, and architects justly claim a share in the initiation of this. Since, and commencing with, the Gothic revival, great attention has been paid to furniture, decoration, needlework, and even ladies' dresses,—all of which have from time to time been designed by architects. So great an improvement has been made in the manufacture of these, that architects are now enabled to give less time to them and more to architecture proper,—the real building in brick and stone. We have now certain well-known æsthetic villages not far from town, where people live in "cots," and fill their gardens with sunflowers,—where ladies dress to suit the houses, and where anything but red brick and white-barred windows are absolutely tabooed. We cannot all live in "cots," even if we wished to, or be surrounded with the quaintness these villages furnish; but the improved taste of the public might assist us to check the miles of dreary stuccoed sepulchres, as they may almost be called, with which the suburbs of London and other large towns are increasingly burdened. Year by year an overwhelming stretch of Portland cement stucco is laid upon us, thicker and thicker. Millions of good money have been spent on these houses, and miles and miles of them have been built, and we cannot remove them, though they fortunately show, in most cases, a great desire speedily to dissolve themselves. But surely it is the fault of the public if this class of building is allowed to still further increase. Let but the speculating builder be given to understand that it is to his interest to supply something of a better character, and he will speedily take means to do so. The æsthetic villages I have referred to at least show that houses may be built of honest materials, be let at moderate rentals, and yet pay; and that palatial monstrosities, badly built, badly drained, and badly planned, are not a necessary evil of the nineteenth century. Great efforts have been made of recent years to improve the dwellings of the labouring classes, and much has been done, but they hardly require it more than the dwellings of the middle classes in our suburbs. Doctors tell us that porous walls, decaying plaster, and very little drainage, are all prolific sources of disease, and yet this is hardly an exaggerated description of the houses I speak of. It rests with the public, who have so far improved in the internal decoration of their houses, to require that their construction, sanitation, and design should be also improved. Mr. William Morris, in an admirable address which I have seen in the *Builder* of to-day [p. 537, *ante*] puts the matter far better than I can when he says that a reasonable share in the beauty of this earth is the right of every man who will earn it by due labour, and that a decent house with decent surroundings for every family is the claim made in the name of art. Our churches have been nearly all restored. Let us now set to work to restore something like design into our residential streets, and, more fortunate than church-restoration, it will probably be a long time before a society is started to oppose it. An attempt has recently been made to improve the stuccoed fronts of London houses by painting them in colours,—dark red being much favoured,—but, to my mind, this only makes matters worse, and it is to be hoped the fashion will not spread. As to the interiors of such houses, many of the ladies who have favoured us with their presence this evening well know the effort necessary to drape or otherwise hide the irrepressible marble chimney-piece, and in summer time to conceal the register-grate, and the vain effort to subdue the rampant cornice to something like subjection to a prettily-designed paper. While in our everyday life we are surrounded by so much that is bad and utterly commonplace, it seems too much to hope that an occasional grand church, public building, or mansion can affect largely the general taste against so much that is enervating and bad in their everyday surroundings. Architects are powerless in the matter unless backed by general public opinion, because their aid is not sought in the erection of these houses. Painters have set an example of late years of building houses of a design in accordance with the internal decorations, though these are, as a rule, somewhat larger than houses of the class of which I am speaking. Architecture, to be a living art amongst us, when architects can work with the full sympathy of the public and each other, must not, as it seems to me, be kept for display only in our public buildings (though these, of course, will always call forth its highest powers), but must also be found in our houses, so that, by beginning at the lower level, we may work upwards. When a knowledge of and interest in architecture have been more widely extended, we shall soon see the result, not only in our great buildings, but also in our small dwellings, which, it is to be hoped, will some day be "designed in beauty and built in truth."

Professor Roger Smith said it was always a pleasure to attend the opening meeting of the Association, and to see one old friend after another advancing to preside over its year's work after having done much good service for it in previous years. He congratulated the President upon the large number of visitors who had come to support him on that occasion. He trusted that the session upon which the Association was then entering,—and which, in some respects, was a more than ordinarily important one,—might meet with all the success which could be desired. With regard to the Examination which had been established, and the efforts of the members to prepare themselves for it, he should shortly have an opportunity of speaking to them on the whole question, and would only now say that anything which could be done by the Association towards attaining success would have his most cordial goodwill, and, as far as other engagements would allow, such assistance as it might be in his power to give. A member of the Association was now the Professor of Architecture at University College, and on that ground he thought that University College and the Architectural Association classes ought to give one another any assistance that they could. Referring to the presentation of prizes, he said it appeared to him that the work which had been done during the last session in competition for those prizes was very creditable, and that the gentlemen who had obtained the prizes were to be congratulated upon having achieved substantial successes,—successes which were, he hoped, auguries of their obtaining some of the prizes of the profession in after-life. He believed that it was as true with regard to the profession of architecture as it was of that portion of animated nature which Mr. Darwin had studied, that in the struggle for existence only the fittest would survive. It struck him that those who had begun professional life by obtaining these prizes would be the most likely to be successful in after-life. The very effort to secure the prizes offered by the Association and in other quarters would be of lasting benefit to all who had striven earnestly for them, even though they were not actually fortunate in carrying them off. For the time being, the pursuit after the honour of obtaining the prizes offered by schools and academies was keen, and the competitors looked very little beyond it, but the real object of such contests lay behind. It was not for the sake of adding "M.A." or "B.A." to his name that a student toiled for years, but for the sake of obtaining that cultivation of which those letters appended to his name were the index. It needed only a glance to show that the young men who were doing architectural work in the classes of the Association in competition for the prizes offered were fitting themselves for doing excellent architectural work in after life.

Mr. T. Chatfeild Clarke observed that he had listened with great pleasure to the President's address. He was glad to hear the touching reference made in it to the death of Mr. Burges. The young architects of the present day were to be congratulated on the greatly superior opportunities they had of learning their profession as compared with those available when the senior members of the profession were young. He trusted that the opportunities and advantages which young architects now had would be made available by them to the fullest possible extent. He thanked the President for his appropriate reference to the extreme æstheticism of the day, and which was so justly ridiculed in such plays as "The Colonel." With regard to the question of a new style, it did sometimes strike him as singularly surprising that in the present age,—so fruitful in great design, and characterised by so much scientific knowledge,—learned as were our architects as a body, the discovery of any fresh spring of design or of a new style seemed to be impossible. However much that was to be regretted, it was matter for congratulation that the study and practice of the various styles of design that were known had been pursued so thoroughly in the present day by such men as the late Sir Gilbert Scott and the late Mr. E. M. Barry, and others who might be accounted the most polished and accomplished architects of the present age. He was very glad indeed to see that Canon Barry was going to produce a memoir of his brother, because he felt that Mr. E. M. Barry possessed in an eminent degree the qualities of an "all-round" and cultivated architect,—great power of planning, great facility of design, and great knowledge of style,—and for those qualities he ought to be honourably remembered among architects.

Professor Kerr congratulated Mr. Webb upon having attained to the honour,—the very great honour,—of presiding over a society which occupied so important a position in the profession. The Architectural Association was a society absolutely unique in the world. In no other profession, so far as he was aware, would it be possible for the students,—actually the students,—to combine together and form an organisation which should exercise so much influence as the Architectural Association on the profession to which they belonged. The Association had conducted, for the last thirty-five years, an elaborate organisation of self-instruction, properly so-called, with the greatest possible success. The work which the Association was doing, so far as it appealed to the eye, was seen upon the walls of the room. The draughtsmanship which was there exhibited would be adjudged, by all competent observers, draughtsmanship of the highest quality. The architects of the younger generation had this claim to make before the English world of the present day,—that draughtsmanship had flourished amongst them to a degree that was perfectly amazing. In his estimation the architectural profession had made far more progress in draughtsmanship during the last quarter of a century than painters and sculptors. The masterly skill in drawing which was displayed by so many young men in the architectural profession at the present time seemed almost incredible. So great was their skill that they were on the verge of a particular danger arising out of it, viz., the practice of design

upon the basis of mere draughtsmanship alone, without reference to that philosophical basis of construction which, more than anything else, was at the root of architectural art. But the excellent organisation of the Association was, happily, brought to bear upon facilitating the study of other subjects than the admirable but comparatively superficial one of drawing. The substantialities of building and the administration of an architect's office business were subjects for the study of which the Association afforded means to its members. Altogether, a more useful society than the Architectural Association could not exist in any profession, and he was delighted to see so many young men coming forward and joining the Association with the view of making themselves worthy members of a cultivated and gentlemanly, and, what was no small matter in these days, a thoroughly honest profession.

With this the formal part of the proceedings of the evening terminated.

NO MORE RAILWAY TUNNELS.

It is a remarkable coincidence that at the very moment that a project is taking shape for the construction of a tunnel under circumstances of greater risk and probable cost than any which has yet been attempted, trains should be for the first time started by a method which, if it fulfils the sanguine hopes of the inventor, will remove the chief reason for the construction of tunnels through mountain chains.

The railway system, it is well known, is a growth rather than a creation. The speed now common was never anticipated by the fathers of the system. The discovery of the power of the blast, to which that speed is mainly due, was accidental. It was partly due to the nature of the country between London and Birmingham, and partly to the entire novelty of the great experiment then about to be made, that Mr. Robert Stephenson fixed on the inclination of one in 330 as the ruling gradient of our first trunk line, on the principle that the resistance due to gravity should not exceed the resistance due to friction.

The great saving in the friction resistance effected by the use of the iron rail led engineers, somewhat later, to allow very much wider margin as to the resistance of gravity, or, in other words, as to running up hill. Mr. Brunel was the first to adopt concentrated inclines, treating the locomotive after the fashion of a live horse, that can run up a hill at a spurt. But the limits of nature are inexorable, and while an incline of one in fifty is an outside allowance for railways over very difficult country, a rise of one in twenty is the limit of ordinary engine-power, as all that a locomotive can do is to ascend such a gradient without any load.

Different appliances have been tried, in different places, for surmounting steeper inclines. The temporary Fell Railway ascended the Mont Cenis pass at the incline of one in twelve. But a sharp economical limit is fixed by the rapid increase of the dead, as compared to the live, weight. An engine that could just crawl up an incline of one in twenty could draw a train of 150 tons at twenty-five miles an hour on the level.

Here, in fact, is the weak point of the locomotive engine. It has many great advantages. But it is a costly mode of applying power at the best, producing, all things being taken into account, only about one-fifth of the effect due to the mechanical agency exerted. And this cost increases so enormously with the increase of gradient, that it has been found necessary to spend from 100,000*l.* to 330,000*l.* per mile in making tunnels in order to maintain practicable gradients.

On an incline of one in 100, in addition to the loss of power arising from the use of a locomotive engine on the level, there is an additional resistance equal to more than three times that of the train on the level. On an incline of one in fifty, the resistance is between six and seven times as much. The comparative cost of the locomotive method of traction increases at this rate.

The weight of the locomotives on our English lines may be taken at from thirty to forty per cent. of that of the trains which they draw. If we could substitute fixed power for locomotive power (without inducing extra sources of cost), we should then reduce the work that we have to do by from thirty to forty per cent., and also perform the remaining work at a less cost. Thus the same expenditure of power that would take a locomotive and train up an incline of one in 330 would take a train alone up one in 100. And the same expenditure of power that would take a locomotive and train up an incline of one in 100 would take a train alone up an incline of one in fifty.

Now, if by the use of the electric railway we can substitute a light dynamo-motor machine for the great weight of the locomotive engine, an increase, to that extent, of our power of surmounting inclines will be at once given. It is, therefore, with the utmost interest that the architect, as well as the engineer, will watch the development of the application of electricity to railways. While one great effect of steam has been to concentrate mankind in dense urban masses, it is, perhaps, not too much to hope that it may be a result of the application of electricity to redistribute population more widely over the surface of the country.

PAYMENTS IN CASH, NOTES, AND CHEQUES.

A subject of much interest to all persons engaged in the building trade was illustrated by a paper read by Mr. G. H. Pownal, at the Institute of Bankers on the 19th ult., "On the proportionate Use of Credit Documents and Metallic Money in English Banks." While bankers are those whom it is natural primarily to address on the subject, it has even a more lively interest to those to whom Saturday brings an amount of labour and anxiety in the payment of metallic wages which it is necessary to undergo in order to appreciate. The arrangements under which the exchange of the note of time for silver and copper takes place are perhaps susceptible of improvement, to the advantage both of paymasters and of workmen.

The returns of the past fourteen years show an increase in the amounts passing through the London Clearing-house, from 3,257 millions in 1867-8, to 6,013 millions in 1874-5. In 1877-8 they were 6,088 millions; they fell in 1878-9 to 4,885 millions; rose in the year of the election to 5,265 millions, and fell again to 5,009 millions. Mr. Pownal estimated the aggregate bill and cheque transactions of the English banks for the year at the sum of 11,135 millions sterling. It has been calculated that 97 per cent. of the transactions of the wholesale commerce of the United Kingdom passes through the hands of the bankers; but the opinion was expressed at the meeting, and adopted by the chairman, Sir John Lubbock, that the banking transactions do not by any means represent the amount of business done in the country.

As connected with the payment of wages, it is to be observed that more metallic money is paid into the county banks than bank-notes. This is due to the fact that the smallest note, 5*l.*, is generally useless for the payment of wages. The subject of 1*l.* notes was mentioned with reference to this, but not discussed. The experience of Ireland, where 1*l.* notes were certainly of great convenience during the construction of railways, ought to be conclusive on this head. The proportional payments by cheque, notes, and coin in the present year are shown as follow:—

	London	Dublin.	Edinburgh.	New York.
Coin	0·728	1·57	0·55	0·28
Notes	2·039	8·53	12·67	1·02
Cheques and bills	97·233	89·9	86·78	98·7

Society of Arts.—The first meeting of the new session will be held on Wednesday, November 16th, when the opening address will be delivered by Sir Frederick J. Bramwell, F.R.S., chairman of the Council. The following are among the papers which will be read during the session:—"The American System of Heating Towns by Steam," by Captain Douglas Galton, C.B., F.R.S.; "Stained-glass Windows," by Lewis Foreman Day; "Photometric Standards," by Harold Dixon; "Telephonic Communication," by Lieut.-Col. C. E. Webber; "The Causes and Remedies of Bad Trade," by Walter R. Browne, M.A.; "The Production and Use of Gas for Purposes of Heating and Motive Power," by J. Emmerson Dowson; "Gas for Lighthouses," by John Wigham; "The Relation of Botanical Science to Ornamental Art," by F. Edward Hulme, F.L.S., F.S.A.

THE NEW YORK METROPOLITAN MUSEUM.

The last report of the New York Metropolitan Museum has recently been distributed on this side of the Atlantic, and offers several features of interest. The Museum was founded some years since, as will be remembered by many of our readers, "with a view to giving to the American metropolis and the country at large an institution the aim of which was to excite a powerful influence for good on the intellectual character of the commercial and industrial prosperity of the people." When last we had occasion in these columns to refer to the New York Metropolitan Museum, the collections composing it were still in their old home in Fourteenth-street, where they remained very much crowded from want of room. The new report shows us the Museum moved up town to the grand new building in Central Park, where, however, we learn, the accommodation is still far from sufficient to lodge the continually increasing collection of works of art.

While the report in many respects has a tone of congratulation at the results so far obtained, an earnest appeal is made to the public for support. Desirous to remain as far as possible free from Governmental aid, the Museum looks to its subscribers and donors to extend the benefits, not alone effected by the influence of the works of art exhibited, but by the system of artistic and technical education that has been established in connexion with the Museum. The city of New York has already generously presented the building in Central Park, while the Department of Parks has laid an annual grant at the disposition of the Museum authorities but the expenses of the move from the old quarters down town have been heavy, and we are assured that it is alone by the strictest economy that both ends have been made to meet. To secure the maintenance and future of the Museum, its governing body, in the first place, urge that recognition of its educational importance which, as they remark, is fully accorded in Europe to such kindred institutions in the second place, as being unwilling, from political difference from the constitutions of the nations of the old world, to claim a Government grant, and consequent State interference the authorities urge the necessity of a permanent endowment ample for the support of the Museum, and under the constant supervision of those who may have provided the funds. From the public thus so directly appealed to, the Museum certainly has a right to expect a favourable reply, the report showing that between April 1st, 1880, and the 30th of April last, a total of over 1,200,000 persons visited the Museum.

The working of the Museum is not, however, as we have above remarked, confined to the gathering and exhibiting of works of art belonging to the great European industries of the past. It may be mentioned by the way, as a deficiency which it is to be hoped will in time be supplied, that the interesting and beautiful art of North America is represented in no adequate manner in the New York Museum. A very comprehensive system of technical instruction is supplied by the Museum; indeed, it is on the extension and strengthening of this that the authorities lay the greatest stress, and the passage in the report which refers more particularly to this portion of the labours of the institution merits attention at a moment when not only is the subject of technical education attracting earnest attention on both sides of the Atlantic, but when in the international competition in the struggle for superiority, it is the nation which is the best prepared which will infallibly gain the day, the smallest advantage of one over another will give in the wavering contest the victory. In this battle, for such it has become, it is to the technical instruction we afford our artisans that we, as Englishmen, must look, more even than to the reputation we have so long borne in the world; the countries which we generally understand as "foreign" have been pressing close upon us for years, and America, with its ardent activity, now promises to become a rival. In the report of the New York Metropolitan Museum now before us, an acknowledgment is made of the superiority of our system of technical art instruction, and this, coming from such a quarter, we may feel as purely unprejudiced, an absence of prejudice in the consideration of all matters having been ever a ruling principle of American

progress; but the superiority we are supposed to enjoy, we may rest assured, will not be long retained, unless with equal earnestness our authorities honestly endeavour to inquire into and improve each department which may be under their supervision. Technical schools, remarks the report at present under consideration, for the teaching of artisans, are essential to the progress of American industrial art. The time has certainly arrived when America should cease to be dependent upon foreign production of beautiful work in any and every department of industry, when American youths should have the facilities for learning how to produce beauty which German, French, and especially English youths have in technical schools. It may be affirmed that in every kind of mechanical work, however inferior its character among the arts, the mechanic who can design as well as do his work is worth more to himself and to his employers than one who can only follow a director or do that which he has seen done. If American industrial art is to rank with that of European countries it can only be by having educated artisans. There are thousands of young persons in this city whose talent needs only to be discovered and developed for the supply of the highest class of artisanship in every department of beautiful productions. That this talent exists in abundance is already manifest in our schools.

The technical instruction so far afforded in New York would appear at present to be but in an incipient condition, but the subjects chosen for the various courses point to what future energy may lead, from the 143 pupils who a year ago joined the school then opened in the First Avenue and Sixty-eighth-street; drawing and design, modeling and carving, carriage-drafting, decoration in distemper, and a class of no small practical importance, in plumbing, form the curriculum. With the extension of the Museum buildings every hope is expressed that accommodation will be afforded for these technical classes under the roof of the parent establishment. Small as the beginning may seem, in a land of rapid development such as America, we may with confidence shortly look forward to the results of this first step in a new direction.

An appeal is made by the Museum authorities for the increase of the Art Library as essential not alone to the officials in the compilation of their catalogues and the arrangement of the collections, but for the use of the students and the public generally, who must be supplied with an ample fund of authorities for consultation and instruction.

The report concludes with a lengthy list of donations made to the Museum during the past year, additions to the collection in many instances of the choicest and rarest description.

THE HOLBORN RESTAURANT.

This establishment, which during the last few years has been in the hands of Messrs. Gordon & Co., the enterprising *restaurateurs*, is now, and has been for some time past, in course of rebuilding and enlargement. The work is being carried on without any interruption of the business, which is very extensive. The excellent management of the place has gained for it a reputation of a very different kind from that which attached to it, rightly or wrongly, in the days, or rather nights, when it was known as the Holborn Casino.

In order to extend the Holborn frontage, four houses adjoining the old entrance have been removed, so as to give a total length of frontage of 71 ft. 6 in. Here will be the main *façade*, pleasingly designed in the French Renaissance style by the architects, Messrs. Archer & Green. On the ground story there will be three shops (to be let separately), the central entrance, and, at the west end of the *façade*, the entrance to the *buffet* (now open). The whole of the external masonry of this story will be in Shap granite, the upper portion being in Portland stone, with Shap granite shafts and pilasters. Roughly speaking, the site of the buildings resembles in shape the letter T, with the perpendicular portion thickened, and the bottom of it forming the Holborn *façade*. The left-hand end of the horizontal portion of the letter represents the Little Queen-street *façade*, which will have a frontage of about 43 ft. The site extends southwards from Holborn (or along the upright part of the letter, so to speak) for about 170 ft., the extreme distance from east to west (or along the horizontal member of the letter) being about 150 ft. The *buffet* (the entrance-lobby to which has been decorated with tiles, &c., by Messrs. W. B. Simpson & Sons, of St. Martin's-lane) runs back from Holborn for a distance of 98 ft., and has an average width of 16 ft. This apartment is broken up into five square bays or compartments, and the four coves of the panelled ceiling or roof of each compartment (two or three of them come under the upper floors of the front building, the others being top-lighted by means of stained glass lights) are painted on a gold ground with incidents of the chase, vintage, and other subjects appropriate to the place. These paintings, we understand, are the work of Mr. Durham, of the Slade Life School, University College. The whole of the wall surfaces in this apartment are of costly and tastefully-selected marbles, with detached shafts and other architectural members in relief. The effect is rich but subdued, for though mirrors are largely used there is an absence of anything like garishness. The woodwork is of American walnut, with ebonised mahogany frames to the mirrors. The floor, like those in the grill-room and other parts of the new building, is in quiet-toned marble mosaic, and is the work of Messrs. Burke & Co., of Newman-street, whose name is a guarantee for excellence in this department. This firm has also executed the whole of the marble-work in the *buffet*, grill-room, and in other parts of the building. At the south end of the *buffet*, swing doors give access to a lobby from which, on the right, the gentlemen's lavatory is entered (under a solid marble staircase leading up to the smoking-room), and from which, opposite the *buffet*, the grill-room is entered. The grill-room is a fine apartment 36 ft. by 34 ft. by about 12 ft. 6 in. high, and occupies the site of the former grill-room. On the south side is a range of windows, including a large bay filled with stained glass by Mr. Alexander Gibbs, of Bloomsbury-street. These windows, and others in the building, are very good of their kind, but must be regarded rather as pictures on glass than as stained-glass windows. The walls of this apartment are entirely lined with marble and mirrors, the ceiling being panelled in walnut and "muralis" by Messrs. Campbell, Smith, & Co. A notable feature in this room will be the grill, or rather the structure enclosing the grill. This, which is not yet finished, is in Lambeth glazed majolica ware, supplied by Messrs. Doulton & Co., and will be very effective in appearance and cleanly in use. The gentlemen's lavatory, which is about 25 ft. by 17 ft., and the same height as the grill-room, is handsomely and admirably fitted up. Here, *carte blanche* was given to Mr. George Jennings, of Stangate, by whom all the work (including, besides the various fittings, the wall-tiling, the pavement, and the ceiling) has been done, with the same attention to detail and excellence of workmanship and material which characterise the other apartments in the building. Everybody knows what Mr. Jennings can do, and here he has surpassed himself. The ceiling is of enamelled slate, and the walls are covered with ornamental glazed tiles manufactured by Messrs. Minton. The floor is paved with black and white marble. The woodwork used throughout here is mahogany. The water-closets are of his best and simplest kind, and the lavatories are provided with tip-up basins arranged in sets of three in semicircular slabs of white marble, in order to provide as many basins as possible in a given length, and at the same time to afford the persons using them sufficient "elbow-room." The urinals are of the lipped pattern, fixed against slabs of black marble, the compartment divisions being of white marble. The flushing of these fittings is effected every ten minutes by Mr. Jennings's automatic syphon-flushing tanks. On the pavement level, immediately under the lip of each convenience, is a circular disc of black marble, about 12 in. in diameter, a large part of the central portion of which is perforated in quatre-foil form. The use of this perforation will be obvious. Beneath this perforated disc of black marble is a white basin with flushing-rim, and this basin is flushed automatically at the same time as the other parts of the apparatus. This arrangement has been devised with the view of preventing the accumulation of foul-odoured deposit only too common where iron grids are used in similar situations, and it appears to be entirely successful, for although this apartment has been in use by some hundreds of persons daily for the last nine or ten months, no offensive odour is perceptible. The smoking-room, or south-west room on the first-floor, occupies the same position as the apartment known in the old building as the Duke's Saloon. It is about 45 ft. long by 27 ft. wide, and is nearly 17 ft. high to the surface of the ceiling, from the centre of which rises a large lantern-light glazed with stained glass. This glass, as well as that in the windows of the room, is by Mr. A. L. Moore, of Southampton-row, Holborn. The walls of the room have a dado and superincumbent panelling in walnut-wood, Jacobean in style, and admirably executed. This and the parquet flooring and other fittings and decorations of the room are the work of Messrs. Maple & Co. Above the panelled woodwork is a frieze in "Muralis,"—a wall decoration of the merits of which we have often spoken. The cornice is of walnut and "muralis," with *carton-pierre* enrichments. The bronze gilt statues of the "Four Quarters of the Globe" are by Messrs. Elkington & Co., who also supplied the lamps in the *buffet*. The ceiling is panelled in walnut and embossed "muralis." The gas-fittings here and in some other parts of the new building have been made (from special designs) by Messrs. Hulett & Co., of High Holborn. The panels along the north side of the room are filled in with paintings on canvas (having the appearance, until closely examined, of tapestry) by M. Du Mont, the subjects being taken from incidents in the careers of Queen Elizabeth, Mary Queen of Scots, and Lady Jane Grey. On the east side of the room are three openings looking on the balcony of the grand saloon. These openings, of which the central one is the largest, are intended principally to allow the music from the orchestra in the Grand Saloon to be heard by the occupants of the room, and are filled with exceedingly well-designed and executed wrought-iron grilles, by Messrs. Barnard, Bishop, & Barnard, the appearance of which, however, is not improved by the gilding with which they are entirely covered. The so-called "Tobin" tubes are used here for the admission of fresh air, arrangements being made for the extraction of the vitiated air of the apartment by the lantern-light already mentioned. The external glazing of this and other top-lights in the building is done on Rendle's patent system. We may add that the floors throughout are to be constructed on Messrs. Dennett's fireproof method.

With the exception of a small private dining-room adjoining the smoking-room, the only other portions of the new building completed are some of the offices in the basement, such as the butchery, the vegetable kitchen, &c. The principal kitchen is not yet completed. When it is, it will, of course, be fitted with every possible convenience and appliance to facilitate the work of the busy *chef* and his army of assistants. Messrs. Benham & Sons, of Wigmore-street, will supply and fit the necessary apparatus. The walls of all the kitchens, scalleries, larders, &c., are lined with white glazed bricks.

Before concluding, we must say a few words as to the remaining and larger portion of the work not yet carried out, although it is progressing in sections. The general arrangement of the central portion of the building will adhere very closely to the existing plan. Thus the Grand Saloon will be retained in its present position, and its dimensions, when rebuilt, will be about 88 ft. 6 in. long by 49 ft. 9 in. wide, the roof being carried somewhat higher than the roof of the existing saloon. The balcony, 8 ft. wide, and the orchestra, are features which will be repeated in the new building. Access to the new Grand Saloon from the Little Queen-street entrance will be by a corridor very similar on plan to that at present existing; but from the principal entrance in Holborn, direct access will be had to the saloon through a lobby or crush-room, 27 ft. by 24 ft. This crush-room, which will contain the grand staircase, will necessarily be one of the features of the building, but it is not yet commenced. On the first-floor of the front building, and extending the whole length of the Holborn frontage, will be a banqueting-hall, 68 ft. long, 36 ft. wide, and 21 ft. high; together with smaller dining-rooms for private parties, cloak-rooms, ladies' rooms, dispense kitchen, &c.

The work is being carried out from the architects' designs, by the proprietors, Messrs. Gordon & Co., without the employment of a general contractor, the practical supervision of the whole being in the hands of Mr. G. H. Holloway, clerk of works, and Messrs. W. Spencer and T. Holloway, foremen of works. The total cost of

the buildings, which will probably be completed during the next two years, will approach 70,000*l.*

We may add that many little contrivances and details of arrangement in the work already carried out are the embodiments of suggestions made by Mr. Hamp, the energetic manager.

What we have said with regard to this building would suffice to show the enterprise of Messrs. Gordon & Co. But they are known also as the proprietors of the Grand Hotel, Charing Cross (a venture which has proved so successful that it is now being, as we stated in detail some time ago, considerably enlarged), and of Crosby Hall, and are the projectors and proprietors of the First Avenue Hotel, which will have a frontage on the northern side of Holborn extending from Brownlow-street to Warwick-court, with return frontages to both those thoroughfares. The site of this newest of monster hotels is now being cleared, and as soon as this work has been effected, building operations will be commenced. The building (which will, we understand, be erected by Messrs. Gordon & Co., themselves, under the supervision of Messrs. F. & H. Francis, in conjunction with Messrs. Archer & Green, as architects) will not be so sumptuously fitted and furnished as is the Grand Hotel, as it is intended more especially for the use of mercantile and legal gentlemen. Its situation, midway between the City and the West End, and close to the Inns of Court and New Courts of Justice, would seem to be well chosen to meet the wants of commercial men and lawyers. The estimated cost of this building is 100,000*l.*

THE NEW LEIPSIC CONCERT HALL.

The concerts which, for a hundred years past, have been given in the old *Gewandhaus* at Leipsic, have attained a world-wide celebrity. That hall has, however, ceased to satisfy the musical requirements of the present day, and it has accordingly been determined to erect a special *Concerthaus* for the great Leipsic performances of the future. The architects of this elegant and spacious edifice, the erection of which is now on the point of being commenced, are Herren Gropius & Schmieder, of Berlin, whose design was selected from among those of five competitors. The site will be near the Botanical Gardens, and has been presented to the city for the purpose by the owner, Herr Voigt. The estimated cost of the structure is 49,500*l.*, of which 20,000*l.* are derived from a legacy left by Herr Grassi. The exterior of the edifice, judging from the original drawings, will be exceedingly tasteful and imposing. It is in the favourite Romanesque style. In the interior we find three principal divisions, one being the great hall for the well-known grand concerts, a smaller hall for chamber music, and the *foyer*. The grand hall occupies the centre of the building, the smaller hall and the *foyer* being situated each side. The smaller hall will be carried out in exact imitation of the old *Gewandhaus* hall. The dimensions of the great hall may be gathered from the fact that it covers a space equal to that of the Berlin Opera-house, stage and auditorium inclusive. The Leipsic great hall will contain 1,600 seats, with ample room between each row, and wide passages. The orchestra will be arranged so as to be capable of being removed or made of different dimensions. It will be surmounted by a large organ, placed in a gilded recess.

SPOHR'S MONUMENT AT CASSEL.

The bronze monument in honour of the great musician, Spohr, has recently been completed by Herr Hartzer, a sculptor of Berlin. It will be shortly erected in the city of Cassel, on the Theaterplatz. The monument represents Spohr with his favourite instrument, the violin, in the left hand, while the right hand is raised as in directing a band. The general effect is very good.

Cantor Lectures.—The following are the subjects of the courses of the Society of Arts Cantor Lectures for the session just about to commence:—First course, on "Some of the Industrial Uses of the Calcium Compounds," by Thomas Bolas, F.C.S. Second course, on "Recent Advances in Photography," by Captain Abney, R.E., F.R.S. Third course, on "Hydraulic Machinery," by Prof. John Perry. Fourth course, on "Book Illustration, Old and New," by J. Comyns Carr.

THE COST OF IGNORANCE.

Few persons have any idea of the immense sums which we of England have to pay for want of scientific knowledge, as well as for want of taste and artistic power. It is a very mortifying reflection, for example, that while the raw materials from which most of the coal-tar colours are made are produced in our country, the finished and valuable colours are nearly all manufactured in Germany. The crude and inexpensive materials are exported by us abroad to be converted into colours having many hundred times the value, and these expensive colours have again to be bought by English dyers and calico-printers for use in our staple industries. This was forcibly pointed out by Dr. Roscoe, in a paper on "Artificial Indigo," read before the Royal Institution last season, and which we have recently met with in print. It may be useful, we think, to repeat the passage. The total annual value of manufactured coal-tar colours, says the writer, amounts to about three and a half millions; and as England herself, though furnishing all the raw material, makes only a small fraction of this quantity, but uses a large fraction, it is clear that she loses the profit on the manufacture. The causes of this fact which we must acknowledge, viz., that Germany has driven England out of the field in this important branch of chemical manufacture, are probably various. In the first place, there is no doubt that much of the German success is due to the long-continued attention which their numerous universities have paid to the cultivation of organic chemistry as a pure science, for this is carried out with a degree of completeness and to an extent to which we in England are as yet strangers. Secondly, much, again, is to be attributed to the far more general recognition amongst German than amongst English men of business of the value, from a merely mercantile point of view, of high scientific training. In proof of this it may be mentioned that each of two of the largest German colour works employs no less a number than from twenty-five to thirty highly-educated scientific chemists, at salaries varying from 250*l.* to 500*l.* to 600*l.* per annum. A third cause, which exerts a great influence in this matter, Dr. Roscoe thinks, is the English law of patents. This, in the special case of colouring matters at least, offers no protection to English patentees against foreign infringement; for when these colours are once on the goods they cannot be identified. It cannot be too often pointed out that the study of the most intricate problems of organic chemistry, and those which appear to many to be furthest removed from any practical application, are in reality capable of yielding results having an absolute value measured by hundreds of thousands of pounds.

GYMNASTIC HALL AT BRÜNN, AUSTRIA.

A new "Turnhalle" (Hall of Gymnastics) has been completed at Brünn. It consists principally of a hall, 102 ft. long, 52 ft. 6 in. wide, 50 ft. high, pointed arches, elaborate woodwork with gallery running all round, richly coloured; another large room, 52 ft. 6 in long, 26 ft. 6 in. wide, 26 ft. 6 in. high, with wooden ceiling and rich intarsia decorations, panelling, &c. The building is Gothic in style, and outside is of brick, and very effectively constructed. Herr August Prokop is the architect.

WORKMEN'S DWELLINGS, PLYMOUTH.

The foundation-stone has just been laid of four blocks of dwellings which are now being erected by the Plymouth Workmen's Dwellings Company (Limited) on an exceptionally open site at the manufacturing end of the town. The buildings, which are to be four stories high, and on a somewhat new principle, will contain accommodation for ninety-six families in 256 rooms, exclusive of wash-houses (with drying areas attached), pantries, coal-bunks, and cupboards, w.c.s, and urinals. Each landing will contain provision also for drawing water, and for the removal of dust (in shoots) and dirty water. Each dwelling will be entirely separate. The w.c.s will be separate for the sexes. The buildings will be constructed in a substantial manner, and the sanitary arrangements, we are told, will be efficient.

The contractor is Mr. Philip Blowey, of Buckland Monachorum, and the architects are Messrs. Hine & Odgers, of Plymouth.

It is anticipated that the new dwellings will be quite as successful financially as those recently erected in Lower-street, from the designs of the same architects, and which pay a clear 5 per cent. after making due allowance for voids, &c.; the rent charged for each dwelling (including use of wash-house and all domestic conveniences) being 2s. 2d. per week, except where two bedrooms are attached, instead of one, in which case the rental is 3s. 3d. per week.

VALUE OF BUILDING LAND AT THAMES DITTON.

Last week a building estate at Thames Ditton was sold in 106 lots, at the Swan Hotel, Thames Ditton, by Mr. Richard J. Collier. The property consisted of freehold building land, having frontages to the river Thames and the high road, from Thames Ditton to Hampton Court, and known as Sumner-road. The estate is situated within a short distance of the Thames Ditton Station, on the South-Western Railway, in a favourite boating and yachting locality, offering eligible sites for the erection of river-side residences. Three new roads, each 36 ft. in width, and named respectively Alexandra-road, Queen's-road, and Oakfield-avenue, have been laid out on the estate. There was a numerous attendance at the sale, and all the lots were sold, with a spirited competition, more especially for the several lots facing Oakfield-avenue, and extending in depth to the Thames. These lots, which have frontages of 20 ft. each, with a depth ranging from 180 ft. to 216 ft., realised from 80*l.* to 90*l.* each, a tavern plot, with a frontage of 40 ft., being sold for 156*l.* The total proceeds of the sale amounted to 3,480*l.*

SOUTH LAMBETH DWELLINGS.

The South Lambeth Dwellings, which have been recently built for the South London Dwellings Company, Limited, from designs by Mr. E. Hoole, of 30, Russell-square, occupy the site of Surrey Lodge, for many years the official residence of the Clerk of the Peace, situated at the intersection of the Kennington and the Lambeth roads.

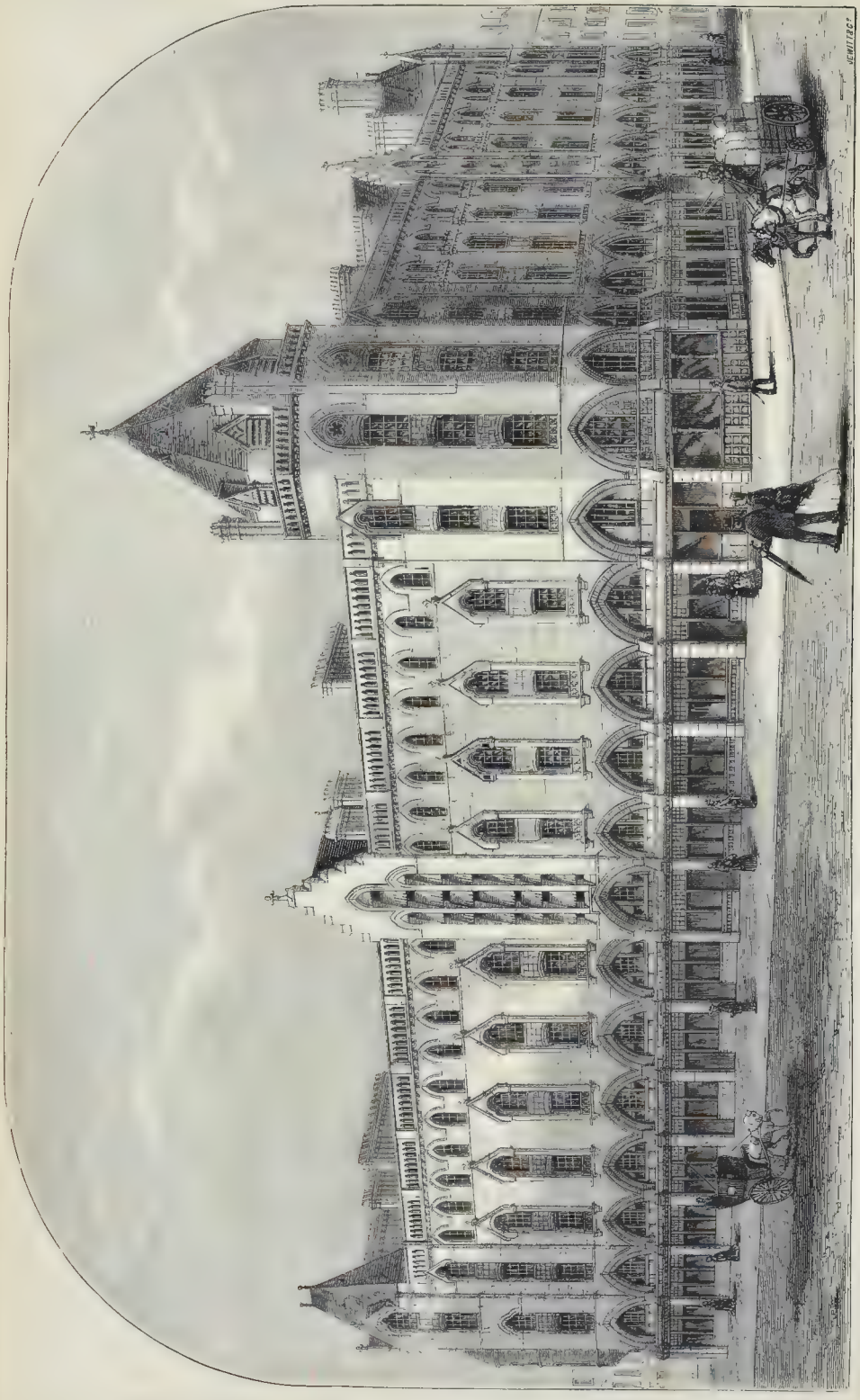
They form a quadrangle, two sides of which consist of blocks of tenements, while the other two are formed of separate cottages. In the centre is a recreation-ground, planted with shrubs and trees, and provided with gymnastic appliances. All the dwellings are prepared for the artisan class, though one of the cottages is occupied by a lady who collects the rents and exercises a general supervision. The blocks, of which we give plans, with the exception of the ground-floor are divided into separate tenements, entered from a balcony on each floor, and contain suites of four, three, and two rooms, while a number of single rooms are also provided. The octagonal tower at the angle is distinct, being separated by party-walls from the Kennington and Lambeth blocks of building. On the ground-floor of this tower is a coffee tavern, with kitchen, stores, &c., in the basement. On the first floor is a club-room; the three floors above are divided into small bedrooms, and are surmounted by the laundry under the conical roof of the tower. Shops, with living and bed rooms attached, and basements below, form the lower part of the blocks of dwellings.

A large portion of the roof is flat, and serves as drying-ground, being level with the laundries, of which the second occupies a tower at the end of the Lambeth block. The laundries are fitted with coppers, &c., assigned to the various tenants. Water is laid on to each floor, and every tenement has its own water-closet.* One room in each tenement is fitted with Barnard's "Diamond" range, in which bread can be baked, and cooking done. A coal-locker is placed in each tenement and a cupboard in each room.

The cottages have each six rooms, with scullery and offices, and are treated in all respects as distinct houses. These dwellings appear to let well.

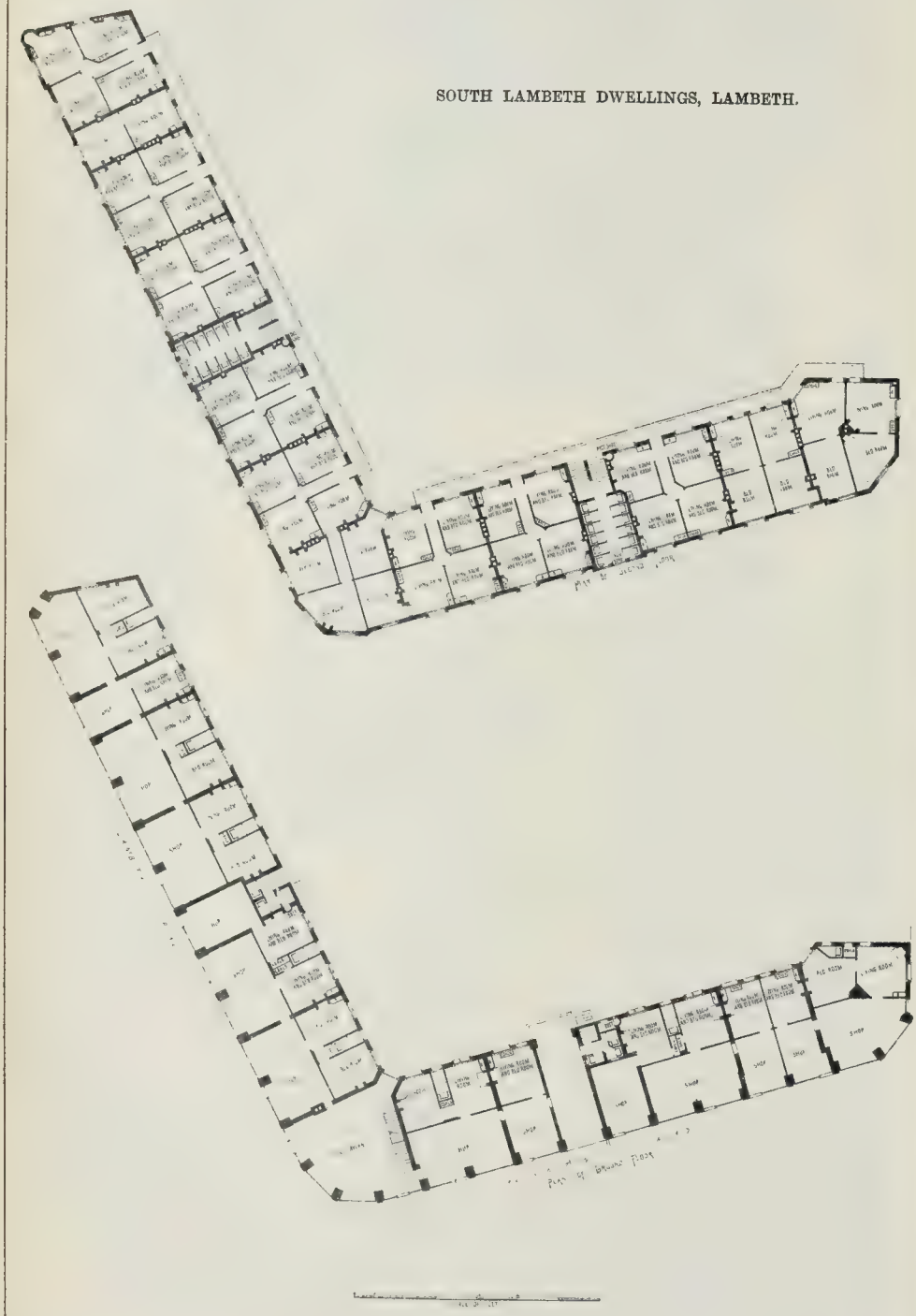
The exterior is faced with red brick, with moulded arches, strings, &c., and red tiled roofs. The intention has been to avoid the monotonous and dismal appearance usually presented by industrial dwellings, and to give a cheerful aspect to a large building on a conspicuous site for housing the working class.

* The position of the water-tap and sink at the end o the group of "closets" is open to objection.

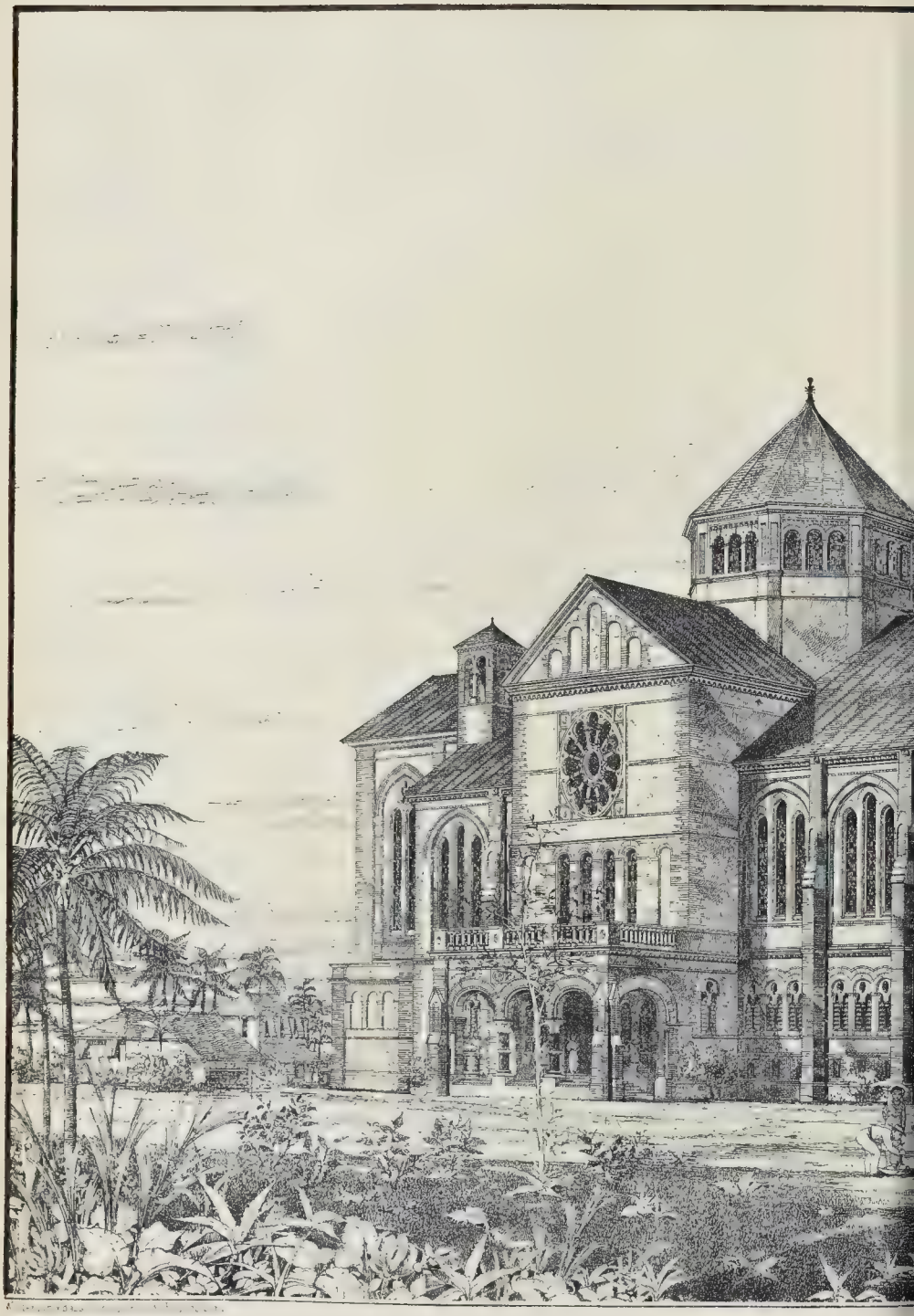


SOUTH LAMBETH DWELLINGS, LAMBETH-ROAD.—Mr. E. Hoole, Architect.

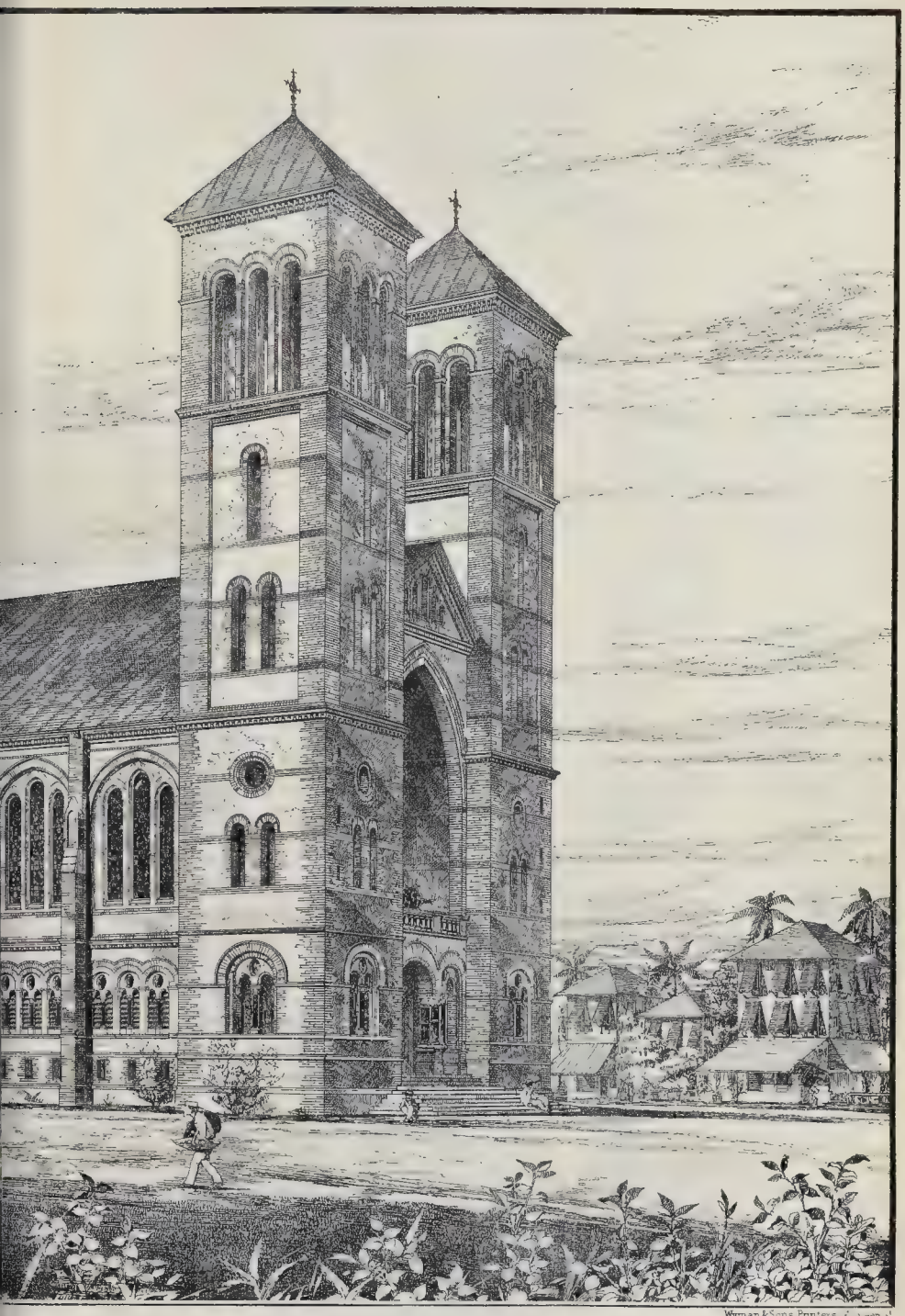
SOUTH LAMBETH DWELLINGS, LAMBETH.



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CATHEDRAL, GEORGE TOWN, DE

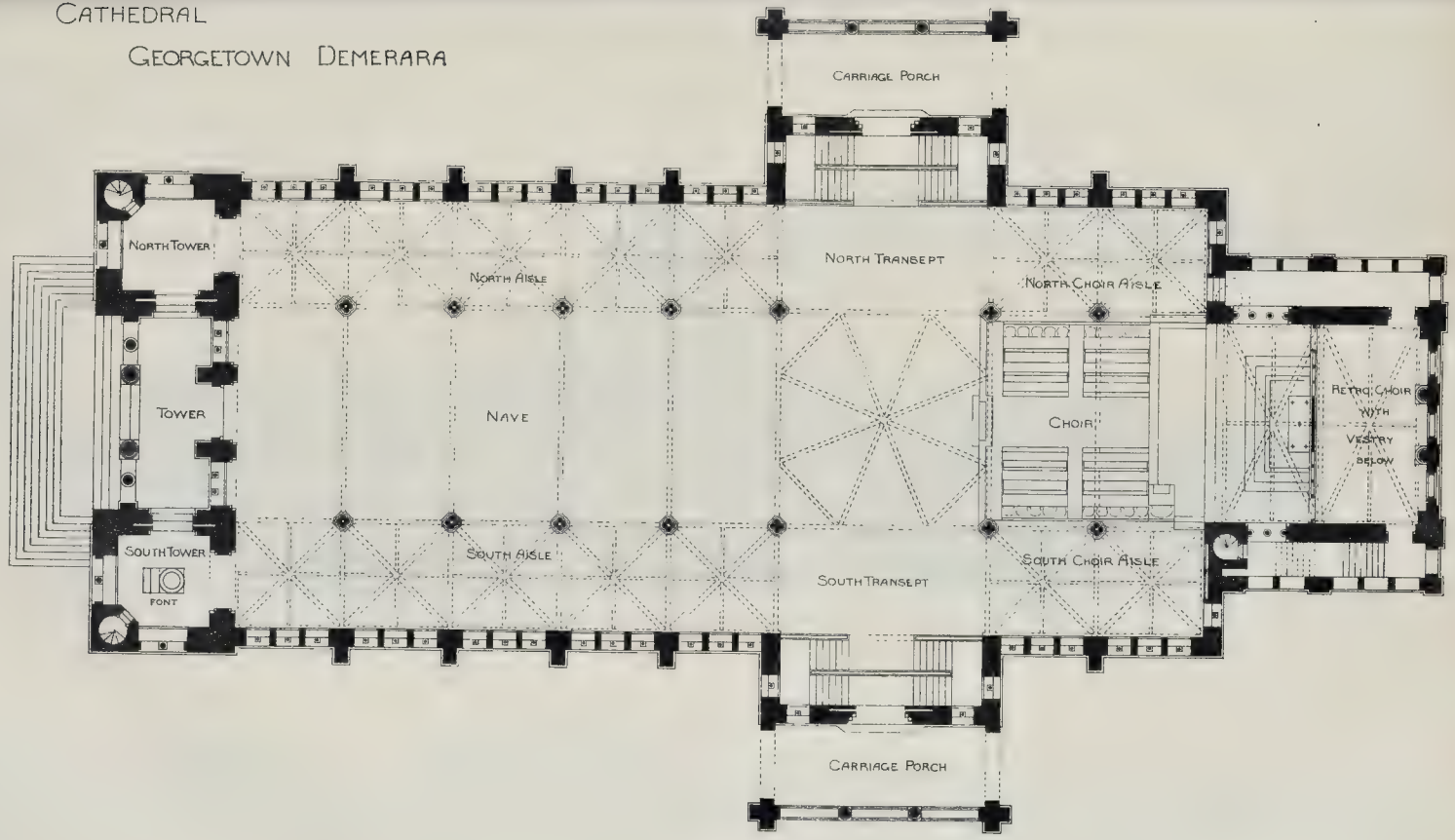


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Mr. Blomfield, M.A., Architect.

CATHEDRAL

GEORGETOWN DEMERARA



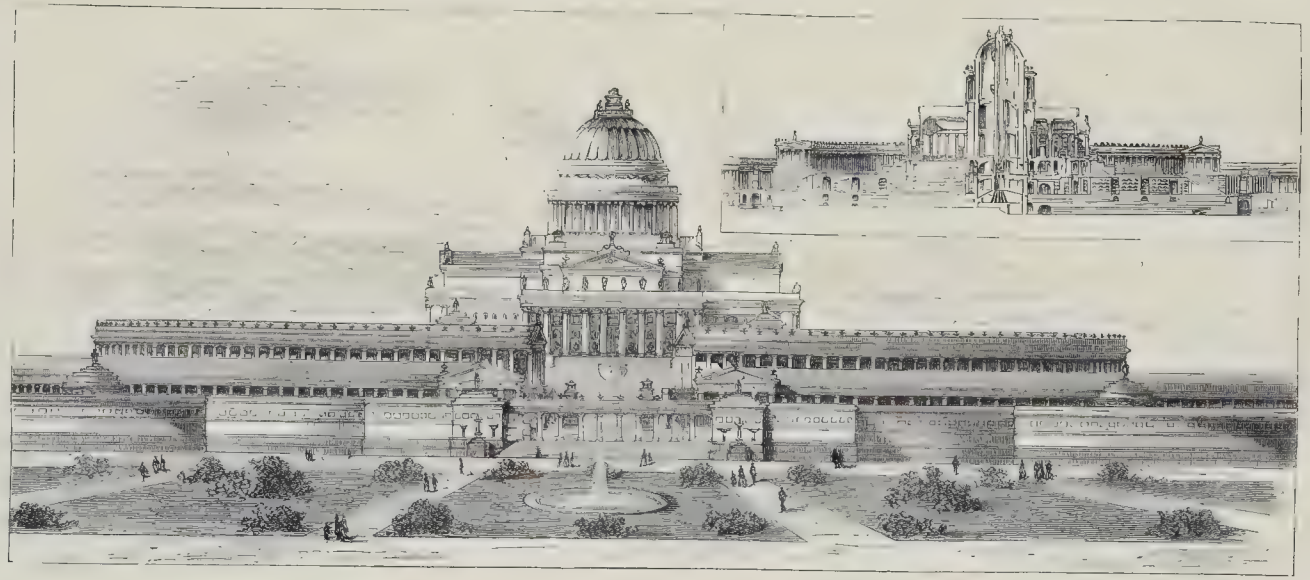
GROUND PLAN

SCALE OF FEET

Day, Haghe & Bass Photo Litho 256 High Holborn

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DESIGN FOR A CAMPO SANTO FOR INTERMENT AND CREMATION.—M. Adamczewski, Warsaw, Architect.



A CAMPO SANTO FOR INTERMENT AND CREMATION.

The first cremation, or "Feuerbestattung" (fire-burial),—the name by which the resuscitated mode of disposing of the dead by fire is now known,—took place in Germany on the 10th of December, 1878; but it cannot be said that since that date the movement has made much progress. On the one hand, it has to encounter a deep-seated prejudice. On the other, the expenses attaching to cremation are very heavy.

As now practised at Gotha, and under the regulations of the Government, fire-burial is rather expensive. About 50 cwt. of brown coal for preparing the gas are required, for which the prime cost of 50 marks is charged. In only one case have there been two successive burials at one heat,—to use a metallurgical expression; the second involving only an additional outlay of 20 marks for 20 cwt. of coal. A further 16 marks are put down for wear and tear of the combustion apparatus, and 14 marks for attendance. A provisional metal urn for holding the collected ashes costs 2 marks. A charge of 30 marks is made for conveying bodies sent from abroad from the railway station to the cemetery. The other expenses are incidental also to the ordinary mode of burial.

The architect, Adamczewski, of Warsaw, has attempted it, and has solicited the co-operation of the authorities at Gotha to make his plan public. He proposes to make the transition from burial or interment to cremation gradual and less repellant.

The building designed by him, of three stories, as shown in our illustration, is estimated to contain no fewer than 60,000 separate catacombs below and above the ground. The project is consequently only suitable for large cities, such as London, Paris, Berlin, Vienna, &c. The building is surmounted by a pantheon, the centre containing the furnace, which is to be kept burning continually, and which consumes the exhalations of the bodies interred in the catacombs, the latter being connected with the fire by air-conduits. A certain space of time, fixed by individual inclination, may thus be ensured during which a body is to be left undisturbed to the decay wrought by the agencies of nature.

We have been unable to get fuller particulars of the plan of the building, but we may add that, according to its author, it has obtained a prize.

CATHEDRAL, GEORGE TOWN, DEMERARA.

The new cathedral about to be erected at George Town, Demerara, of which illustrations are given in our present number, has been designed by Mr. Blomfield.

The requirements of the climate, which are somewhat peculiar, together with the entire absence of any building material except brick, while the funds are too limited to render possible the importation of stone or granite for the purpose, presented a problem somewhat difficult to solve without sacrificing the dignity of effect and the characteristic features which would be naturally looked for in an Anglican cathedral.

George Town being so near the equator, the widely-projecting eaves and the shady cloister-like verandahs usually associated with the idea of a cathedral in the tropics are not required on the sides of a building standing due east and west; nor is there any objection to large windows and the free admission of light. It is, however, not only necessary for the windows to open widely and freely, but the whole of the lower part of the building must be perforated with openings reaching nearly to the floor, and 8 ft. or 9 ft. high, allowing a free passage for the breeze which George Town is said never to be without. These openings are all fitted with iron louvre shutters easily closed not only to exclude the driving rain of sudden tropical showers, but also to keep out the bats at night, of which myriads infest churches and buildings into which they once gain an entrance. The floor of the building is raised about 7 ft. above the ground, which is much insisted on as affording greater facilities for thorough ventilation.

On the north and south are spacious carriage porches, which the climate renders essential features.

To preserve the cathedral character, the building is made cruciform on plan, with two western towers; but, with these exceptions and that of a retro-choir behind the altar-screen, the whole is treated as a large parish church, which indeed it will practically be, affording accommodation for about 1,200 worshippers without crowding.

The style of the building suggested itself as the most suitable to the climate and the materials proposed to be used.

The whole building might perhaps have been designed for construction in timber had it not been for the ants, of which there are two or three varieties, all equally destructive and insidious. A piece of timber may be to all appearance perfectly sound, though completely eaten away and nothing but dust left within. In the present design there is no timber within 30 ft. of the floor, so that no ant-track can be made to it without being speedily detected.

As stone or granite construction was out of the question on account of the cost, it was finally determined to build the walls of Portland cement concrete, a method of construction now beginning to be largely used and well understood in the colony. The quoins, arches, string-courses and cornices, are to be of brick, and the details of the lower arcading, and other ornamental portions, in terra-cotta sent from England.

The columns are of cast-iron, clustered and banded, and support timber posts and arches as well as the roof in one span externally, but internally divided into nave and aisles. The timber is to be pitch-pine, imported from North America. Internally, the nave and transepts have boarded and ribbed ceilings in a pointed wagon form, and the aisles and choir have wooden groined ceilings. Externally, the roofs are covered with galvanised iron, the roof-covering said to be found most suitable to the climate.

The cost of the building, exclusive of work below the ground-line, the upper part of the towers, and the fittings, is estimated at 20,000*l.*, and it is intended to make a commencement at once with the foundations and the choir. A reference to the ground-plan will explain the general arrangements more clearly than a verbal description.

The Corporation of Accrington have decided to apply to Parliament in the ensuing session for powers to construct about 7½ miles of tramways, extensive intercepting and outfall sewers, precipitation works, a branch canal about a mile in length, and new store-yard, with stabling, sheds, and railway sidings. The plans are being prepared by Mr. E. Knowles, the Borough Engineer and Surveyor.

SOUTHAM.

On the 28th ult., the new sewage-disposal works were formally handed over by the engineer, Mr. Edward Pritchard, C.E., of Westminster and Birmingham, to the committee of the Southam Union Rural Sanitary Authority. The works comprised the laying of a main outfall sewer from the old tanks to new outfall grounds, and the preparation of the outfall grounds for the reception and purification of the sewage, which are comprised of three acres of land of a suitable description, situate near Old Ford Bridge, Welsh-road, about a mile from Southam, which had been purchased by the Sanitary Authority under the compulsory powers of the Public Health Act, 1875, and the Lands Clauses Consolidation Acts. The grounds have been formed into six beds of level formation, having properly-constructed deep drains, sewage-distributing carriers and chambers, and well-formed roads. The system of purification adopted is that of "intermittent filtration," which, whilst giving the best possible results in the purification, affords considerable facilities for the utilisation of the sewage by admitting the proper cultivation of green crops and roots upon the ridges between which the sewage flows, the whole of the beds being thrown up in ridges one yard apart, the sewage being distributed upon the beds from three chambers running down the centre of the ground, connected by disc valves, the pipes to the respective beds being connected with the chambers by flap-valves, so that the sewage can be distributed on any part of the grounds at the will of the manager of the works.

The cost of the works, inclusive of the purchase of the land, has been about 2,500*l.*

INDEX TO THE MINUTES OF PROCEEDINGS OF THE INSTITUTION OF CIVIL ENGINEERS.

We congratulate all who possess, or who have access to, the valuable professional library which is formed by the sixty-six volumes of the "Minutes of Proceedings of the Institution of Civil Engineers," on the completion of that desideratum,—a subject index. Each volume of the "Minutes" contains an elaborate index to its own contents, and there exists besides a general index from volume i. to volume xx., and a continuation of the same from volume xxi. to volume xxx. But the value of the later volumes, which are full of the most detailed, as well as of the newest matter, has been greatly enhanced by the completion of the new index. It may be judged how serious has been the work encountered by the index-makers from the fact that the book only comes down to volume lviii., showing that eight quarterly volumes have been issued, and two years have elapsed, since the index was so far put in form as not to be open for further additions.

It should be noted that the plan of the new index has enabled the secretary, Mr. Forrest, to condense the information given within 374 pages, while the old index for the first twenty volumes contains 367, and the supplementary index 206 pages. This condensation is the result, not of slovenliness, but of the reverse; very great judgment has been shown in the mode in which the fullest indications of the subjects indexed are given in the least space. But perhaps the chief cause of the economy of room is that the plan adopted has been to index subjects alone, the names of authors and of speakers being treated as subordinate. Their names, indeed, are fully given, but not as headings. For example,—in the old index six names of members of the Institution commence the letter G, occupying a third of a column, before the reader comes to "Galvanic Action." In the new index G commences "Galvanised Iron: see iron, wrought, preservation of," "Galvanometers: see electricity, voltaic, gas, coal, general references." Thus "the arrangement is essentially analytical, and the alphabetical arrangement has been combined with a certain amount of classification, thereby affording facility for consultation, by which it is hoped any given subject of inquiry may be reached with the least expenditure of time and trouble." And not only is the plan admirable, but, so far as we have been able to test it, it has been ably carried out.

It will be worth the consideration of the Council of the Institution whether they will not complete this valuable key to the *corpus* of their "Transactions" by printing a nominal index, which shall contain those nominal alphabetical references which are found in the two former volumes and omitted from the present one. In that case, the change now made will be of unmixed advantage. The labour of compiling such a nominal index will be small compared with that which must have been devoted to the volume before us. And while the subject index is a necessary intermediary between the world of readers and the volumes of Proceedings, the nominal index would form a perpetual commemoration of the founders and members of this important society.

THE INSTITUTION OF CIVIL ENGINEERS.

The Council of the Institution of Civil Engineers invite communications, of a complete and comprehensive character, on any of the subjects included in a list which they have published, as well as on other analogous questions. For approved original communications the Council will award premiums, arising out of special funds bequeathed for the purpose.

The Council have awarded the following premiums:—

For Papers read at the Ordinary Meetings.

1. George Stephenson medals and Telford premiums, to Thomas Forster Brown and George Frederick Adams, for their paper on "Deep Winning of Coal in South Wales."
2. A Watt medal and a Telford premium, to John Isaac Thornycroft, for his paper on "Torpedo Boats and Light Yachts for high-speed Steam Navigation."
3. A Telford medal and a Telford premium, to Theophilus Seyrig, for his paper on "The Different Modes of Erecting Iron Bridges."
4. A Telford medal and a Telford premium, to Max am Ende, for his paper on "The Weight and Limiting Dimensions of Girder Bridges."
5. A George Stephenson medal and a Telford premium, to Benjamin Baker,* for his paper on "The Actual Lateral Pressure of Earthwork."
6. A Telford premium, to Richard Henry Brunton,† for his paper on "The Production of Paraffin and Parraffin Oils."
7. A Telford premium, to Charles Colson,† for his paper on "Portsmouth Dockyard Extension Works."
8. A Telford premium, to Christian Hendrick Meyer, for his paper on the "Temporary Works and Plant at the Portsmouth Dockyard Extension."
9. A Telford premium, to Benjamin Walker, for his paper on "Machinery for Steel-making by the Bessemer and the Siemens Processes."
10. The Manby premium, to Joseph Prime Maxwell, for his paper on "New Zealand Government Railways."

For Papers printed in the Proceedings without being discussed.

1. A Telford medal and a Telford premium, to Dr. J. Weyrauch, for his paper on "The Calculation of Dimensions as depending on the Ultimate Working Strength of Materials."
2. A Telford premium, to James Richard Bell, for his paper on "The Empress Bridge over the Sutlej."
3. A Telford premium, to John Lewis Felix Target,† for his paper "Experiments on a New Form of Module for Irrigation purposes."
4. A Telford premium, to William Thomas Henney Carrington, for his paper on "Three Systems of Wire-rope Transport."

LIVERPOOL ENGINEERING SOCIETY.

The usual fortnightly meeting of this Society was held last week at the Royal Institution, Colquitt-street, Mr. A. Holt, president, in the chair. A paper by Mr. Wm. Kissack, Stud. Inst. C.E., on the "Extension of the Promenade at Southport," was, in the absence of the author, read by the Hon. Secretary. The work, Parliamentary powers for which were obtained in 1876, consists of a promenade 25 ft.; carriage-road, 25 ft.; and footpath, 10 ft. wide, formed on an embankment 12 ft. above the level of the shore, enclosing 42 acres of land reclaimed by it. This land was bought by the Corporation at a cost of 9,000*l.*, roads and sewers have been constructed on it, the portion between the roads has been filled up to a height of 2 ft. above the top of the sewers, and is now being sold in building plots. By the sale of the land the Corporation will recoup the whole of the money expended on the works. The sand for the embankment was brought by a line of rails laid along the shore, from the sandhills at Birkdale, a distance of two miles and a half, being filled into the wagons by a steam "excavator," which filled 300 four-cube-yard wagons per day, thus doing the work of seventy men. The embankment is protected by a sea-wall made of concrete, consisting of 1 of Portland cement to 6 of sandstone broken to pass a 2-in. ring. The concrete was deposited in layers 6 in. thick, and punned with a 30 lb. rammer. The toe of the wall, which is 2 ft. 6 in. thick, is 20 ft. out from the face of the plinth, and it

* Has previously received a Telford medal and a Telford premium.
† Have previously received Telford premiums.

rises with a gentle curve to the finished surface of the promenade, where it is 1 ft. 6 in. thick, and is finished with a plinth 2 ft. high, surmounted by an ornamental cast-iron railing. The top of the plinth is 8 ft. above high-water mark of a 21-ft. tide, which is the highest known, and is provided with "weep-holes" at intervals of 6 ft. There is an approach-road to the shore at Sea Bank-road, with a gradient of 1 in 15, and opposite each new street is a flight of steps in concrete. The promenade and carriageway are laid with asphalte on stone pitching, and the footwalk is tiled with Welsh freclay tiles. The works, which comprise 400,000 cubic yards of embankment, 8,000 cubic yards of concrete, 24,000 square yards of asphalting, and four miles of sewers, have been carried out in a creditable manner by Messrs. Gripper & Bayliss, of Westminster, at a cost of 32,000*l.*, and are from the designs of the Borough Engineer, Mr. Wm. Crabtree, Assoc. M.Inst.C.E.

A vote of thanks to the author for his interesting paper was given.

THE GREAT EASTERN COMPANY'S NEW BRIDGE WORKS AT BRICK-LANE.

The old bridge which carries the Great Eastern Railway over Brick-lane is about to be taken down, and a new one of much larger dimensions, as regards both length and breadth, is to be erected in its place. The extension of the bridge has become necessary in carrying out the company's new goods station at Shoreditch, which has now for some time past been in progress. The intention of the company was to extend the present brick arch 23 ft. on the south side, and also to construct a new girder bridge on the north side, 40 ft. in width, and with the view of carrying out the works the company have recently placed themselves in communication with the Whitechapel and Bethnal-green Boards of Works, in whose districts respectively the contemplated extensions are situated. This has led to a conference between the representatives of the railway company and the local authorities, the result of which is that the present old brick arch carrying the line over Brick-lane, which it appears has for some time past been a subject of public complaint, is to be removed altogether, and an entirely new girder bridge erected, with extensions both north and south of the existing structure, having a uniform width across Brick-lane throughout its entire length, of 40 ft. In consideration of the railway company having agreed to demolish the old brick bridge, the local authorities undertake to bear a portion of the cost of the new structure. As regards the progress of these extensive station works, which were commenced upwards of three years ago, it is expected that it will yet take something like twelve months entirely to complete them. The station will occupy the large area of thirteen acres, its length from High-street, Shoreditch, to Brick-lane, being 1,400 ft. or upwards of a quarter of a mile, with a uniform width of 400 ft. The principal warehouse above the substructure covers an area of five acres, 10,000 tons of iron being used in its construction, and the outbuildings include, amongst others, a large fruit-shed, where the Continental fruit traffic, amounting in the busiest part of the season, to about 300 tons per day, will be received. In addition to purely station purposes, it is intended to utilise portions of the structure for market purposes, one side of the substructure being used as a potato-market, whilst it is said that the other side will in all probability form a large fish-market. The estimated total cost of the station when completed is 300,000*l.*

THE NEW ROYAL COURTS OF JUSTICE CHAMBERS.

In anticipation of the completion and opening of the new Law Courts next year, the work of clearing a site on the opposite side of the Strand, preparatory to the erection of the Royal Courts of Justice Chambers, has been commenced within the last few days. The company which has been formed for the erection of the building held its first meeting a few days since, at the offices in Devereux-court, Temple, when Mr. Morgan Lloyd, Q.C., who presided, stated that 54,330*l.* of the authorised capital of 80,000*l.* had already been subscribed. He said the architects estimated that the works would cost 55,000*l.*, and they had assured the Board that such sum would cover the entire cost of the building. The present subscribed capital was therefore very nearly enough for the purpose, and if the architects were right in their calculations, very little more capital would be required, and so far as the works had proceeded, the contracts had been let at sums within the estimates. The contracts already let were for the demolition of the old buildings and for the excavations, and also laying the foundations to the height of 5 ft., which were let for about 6,000*l.* to responsible contractors. The excavations would have to reach a sufficient depth to provide for two floors below the present level of the ground. In reply to an inquiry from a shareholder, the chairman said the directors had not yet secured a right to make a subway under the Strand, but the matter was under the consideration of the Board of Works.

In addition to the several blocks of property opposite the Law Courts which are being cleared away for the new chambers, a large number of offices and other buildings, extending a considerable depth southwards, are likewise in course of demolition.

THE LATE WILLIAM BRODIE, R.S.A.

On Saturday, the 29th ult., Mr. William Brodie who for many years, held a foremost place amongst Scottish sculptors, died at his house in Edinburgh. He was a native of Banff, and commenced life as a plumber and gasfitter. He was imbued with an intense love of the beautiful, and came to Edinburgh, with the purpose of prosecuting his art-studies, about forty years ago. For ten years he toiled hard, scarcely earning sufficient to support existence, and almost unnoticed and unknown. In 1851 he sent a statuette group of "Nell and her Grandfather" to the Great Exhibition, and it was consigned to the obscurity of the lumber of one of the spare galleries. Year after year he sent his works to the Royal Scottish Academy Exhibition; a few were admitted, but he found neither purchasers nor patrons. One afternoon the writer of this notice called on him, and found him in his studio disconsolately gazing on his exhibits that had been returned that morning from the galleries of the Academy Exhibition. "High art," he said, "won't keep my wife and me and the bairns,'so I'll go back to the gaspipes and plumbing." "Ye'll be a great man yet, Willie, if you would only keep up your heart. You stick to your art and I'll stick to you and the bairns, and I'll see that none of us ever come to want," said his wife; but the only reply to her cheery words and encouraging smile was a sad shake of the head. The writer spoke a few consolatory words and, with a promise to call on the following day, left. By the forenoon of the morrow the scene in the studio was changed,—the sculptor and his wife were in tears, they were almost too happy to speak. In the meantime, an Edinburgh merchant had called on Mr. Brodie, and after telling him how much he appreciated his talent and regretted his want of success, handed him a bank-cheque. "That, Mr. Brodie, will enable you to go to Rome and devote two years to study. In your absence I will see that all proper attention is paid to your wife and children." Brodie went, studied, and returned to take rank among the foremost of Scottish sculptors. Up to within a year of his death, William Brodie was constantly employed over works which vividly displayed his appreciation of beauty and tenderness. Many of the statues which fill the niches of the Scott Monument in Edinburgh, the design and erection of his friend George Kemp, were the work of William Brodie, who, at the time of his death, held the office of secretary to the Royal Scottish Academy. He was in the sixty-seventh year.

THE LATE MR. G. R. FRENCH.

We regret to have to announce the death of Mr. George Russell French, architect, who expired on the 14th of October, after a long and painful illness, and was interred at the Willesden Cemetery. In his early career he was engaged in designing and superintending the erection of several mansions and other buildings for noblemen and gentlemen. For many years he acted as surveyor to the Worshipful Company of Ironmongers, and within the last few years retired on a pension. Mr. French entered into several important competitions; for example, the new Houses of Parliament and other buildings. He will, however, be better remembered by his literary labours than his professional practice. He was one of the earliest contributors to the *Builder*, and author of several pamphlets. One entitled "The Palace, the National Gallery, and the Royal Academy," which in 1846 appeared in the *Builder*, in five letters, received favourable notice from the public press, and created much discussion. His chief works comprise a "Genealogical History of England," "Shakspeareana Genealogica," published in 1869, as a supplement to the Cambridge edition of Shakspeare, and a "Catalogue of the Antiquities and Works of Art exhibited at Ironmongers' Hall, London," in 1861, which contains, in addition to numerous illustrations, a store of archæological knowledge. Mr. French was seventy-eight years of age, and died a bachelor.

FRIEDRICH HITZIG.

This noted German architect and artist, who died on the 11th ult., in his seventy-first year, was buried in the same Berlin cemetery in which the remains of his master, Schinkel, lie. The obsequies were attended by several Ministers of State, the members of the Royal Berlin Academy of Arts, of which the deceased was president, and of the Berlin Academy of Architecture, of which he was vice-president, and a large number of architects, artists, and other distinguished persons,—ample testimony to the wide and deep respect in which Friedrich Hitzig was held by his contemporaries. Hitzig may be regarded as the last representative of the Berlin school which arose under the influence of Schinkel. He was the creator of many important works, in which all the varieties of his particular school are well represented. His two last works were the entire reconstruction of the Zeughaus, and the plan for the new Technical High School, both at Berlin. The former he lived to complete, the latter he has left in course of erection. Both works are well worthy of his reputation. Hitzig was of late years the acknowledged head of the entire sphere of arts and architecture in the German capital.

ROBERT HOOKE, ARCHITECT.

How much the London of to-day differs from the London of fifty years ago can scarcely be credited except by those who are old enough to remember its appearance during the reign of George IV. At that time the chief features of the city,—the churches, public buildings, and streets,—presented almost the same aspect to the citizens and wayfarers as they had done during the previous hundred and fifty years; it was the city that arose from the ashes of the Great Fire in 1666. But the removal of the houses in old St. Martin's-le-Grand, to make room for the erection of the General Post Office, and the making of the approaches to new London Bridge, were the beginning of a march of improvement and alteration which has continued until the present time, and goes on at an ever-increasing rate; so that by the commencement of the next century the city, with its palatial offices, gigantic railway stations and trading emporiums, will present an appearance differing far more widely from the London of the Georges than that did from the London of Queen Elizabeth and Shakespeare's days. While some of the houses and streets which are associated with so much that is interesting in our domestic history during the last two centuries yet remain, I venture to ask whether Robert Hooke was employed as architect, and to what extent he assisted in the rebuilding of the city. He is best known by his scientific researches and wonderful mechanical contrivances; but that he attained some fame as an architect is proved by the erection, from his designs, of three large buildings in what were then the suburbs of London. These were Bethlehem Hospital, in Moorfields, erected at a cost of 17,000*l.*, which remained until 1814, when it was taken down and Finsbury formed on the ground; Montague House, Bloomsbury, built in 1678 for Ralph, third Baron of that name (this building was unfortunately destroyed by fire a few years after its construction, but John Evelyn, in his "Diary," speaks of it as a "fine palace built after the French style"), on the site of which the British Museum now stands; and Aske's Almshouses, at Hoxton, an important building, erected for the Haberdashers' Company. For this last work Hooke is said to have been recommended by Arch-

bishop Tenison. Hooke, as well as John Evelyn and Mr. (afterwards Sir) Christopher Wren, after the Fire submitted plans for the rebuilding of the city; and although Wren's scheme was approved by the King, Hooke's model, which was submitted to the Royal Society, found such favour among the civic authorities that it led to his appointment as Surveyor to the Corporation, in which capacity he toiled early and late in laying out the ground for the several proprietors. When a young man, his abilities attracted the attention of Boyle, Wren, and others at Oxford, and his mechanical ingenuity and penetrative sagacity must have been of value in the early days of experimental philosophy. If we consider the large number of churches, in addition to the cathedral, that were erected from the designs of Wren, it is evident that his time must have been fully occupied; and it is from Hooke's intimate connexion with Wren during many years that I am led to infer that many other structures, besides those already mentioned, were built from Hooke's designs, although I have never met with any notice of them.

Thos. J. Hux.*

THE LONDON, CHATHAM, AND DOVER RAILWAY, AND THE NEW VEGETABLE MARKET.

There appears to be a strong probability that the opening of the new Fruit and Vegetable Market in Farringdon-street will be the means of adding considerably to the merchandise traffic of the London, Chatham, & Dover Railway Company. That portion of the company's line between Ludgate-hill and the Moorgate-street and Farringdon-street stations, runs parallel with the market on the east side, on a sharp descending gradient, the level of the railway at this point being about equal with that of the basement of the market. This admits of the railway company obaining easy access to the market basement, which we are informed they have taken advantage of by becoming the lessees of a considerable area of the basement, and that they are converting it into a depot for fruit and vegetables, which they contemplate bringing to the market from the several districts in Kent intersected by the railway. For the reception of this class of traffic four lines of railway are at present being laid down, which will afford accommodation for a large number of fruit and vegetable-laden wagons. As Kent is proverbially known as "The Garden of England" it may reasonably be supposed that the market will be very largely supplied from this district, and that the traffic receipts of the Chatham & Dover Company will be correspondingly increased.

SWINDON.

The cemetery for this rapidly-increasing town is now complete. The site, eleven acres in extent, is charmingly situated on the side of a hill, and from which a splendid view is obtained. The buildings consist of chapel, caretaker's lodge, and mortuary, and are built of local stone, with Bath-stone dressings. The chapel is in the style of the thirteenth century, and will accommodate 100 persons. It has an apsidal end, and a bell-turret. The roof is covered with Bangor slates, with bands of "Eureka" green. The fittings are of pitch-pine; the tiles are from Minton, Hollins, & Co.; and the cresting and finials from Messrs. Cooper & Son, of Maidenhead. The carving has been executed by Mr. Chapman, of Bath. There are four entrances, conveniently situated for access from all parts of the town, and the whole site is enclosed by a substantial iron fence, 8 ft. high, with dwarf wall and stone piers. The drainage consists of agricultural pipes laid 9 ft. deep and 30 ft. apart, and connected to 9 in. mains, and in excavating for these a large number of boulder stones were found, and the ground being "pricked" over for them, some 5,000 tons were got out, and used in the road-making.

The work has been carried out from the designs and under the superintendence of Mr. W. H. Read, architect, of Swindon, whose plans were selected in a limited competition. The contractors are Messrs. Phillips & Powell and G. Wiltshire jointly, and Mr. Gilling has acted as clerk of the works. The iron fencing and gates are by Mr. Affleck and Messrs. Edwards & Co., of Swindon; and the grounds have been planted by Mr. Tucker, nurseryman, of Faringdon. The total cost is about 10,000*l.*

* From *Notes and Queries*.

FULMODESTON CHURCH.

The new Church at Fulmodeston, Norfolk, consecrated on the 19th ult., is erected in the middle of the village, and is intended to supersede the old church, which is very inconveniently situated, and which will for the future be used only for the burial service for funerals in the old churchyard.

The new church consists of a nave and chancel, a south aisle, with three arches opening into the nave, a vestry or chancel aisle, also on the south side, and shut off from the aisle and chancel by ornamental screens. On the north side there is a porch. The style adopted is late fourteenth century. The walls are built of flint, with Bath and Ancaster stone dressings, and internally they are lined with red bricks, with patterns of white bricks. There are open-timber roofs, that of the chancel being panelled and boarded.

At the east end there is a stone reredos, with columns of polished alabaster. The pulpit is also of stone, and has an alabaster cornice and columns. The font is an old thirteenth-century base and columns, with the bowl renewed in accordance with the old. Until now it has stood for many years in the churchyard to Croxton Chapel, Norfolk.

The outer doorway to the porch is also old, and was brought from the old church at Fulmodeston, and re-used. The seats in the nave and chancel are new (oak being used in the chancel). Those in the aisle were brought out of Croxton Chapel and refixed. The altar table and rail were also brought from Fulmodeston old church.

The whole of the works have been executed by Messrs. Cornish & Gaymer, of North Walsham, Norfolk, under the direction of the architect, Mr. Wm. Bassett Smith, John-street, Adelphi.

A NEW WESLEYAN CHAPEL FOR NEWCASTLE-UPON-TYNE.

The Wesleyan Methodists of West Jesmond, Newcastle-upon-Tyne, after worshipping for some years in a temporary iron church, have just laid the memorial stones of a new chapel and lecture-hall. This is part of a project embracing the sweeping away of the debt upon Brunswick Place Chapel, requiring about 13,500*l.* The committee entrusted with the carrying out of the new works some few months back resolved upon inviting a number of London and provincial architects of well-known repute in church building to furnish them with designs from which they might select the one best adapted to the exigencies of the site. The result of the competition was that they awarded the first premium to the design submitted by Mr. J. J. Lish, architect, Newcastle-upon-Tyne.

A lofty tower forms part of the design, and provision is to be made for the placing of a clock in it, high above all neighbouring roofs and obstacles. The chapel will consist of a nave, aisles, and transepts. Behind, or to the south of the main buildings, will be three large class-meeting vestries, a ladies' vestry with cloak-room adjoining, a minister's vestry with lavatory, a "mothers' meeting" vestry, and a tea-preparing room. The contractors entrusted with the carrying out of the works are Messrs. Lishman & Salter, Ryton-on-Tyne.

BOROUGH ENGINEERS.

Mr. Alfred M. Fowler, Borough Engineer of Newcastle-upon-Tyne, complains strongly of the obstacles which have been thrown in the way of the proper discharge of his duty, and has addressed a letter to the Council to denounce the present state of things. Mr. Fowler says he has never had full charge and control of the business and staff. The want of a proper understanding on one side or the other is evident.

The Surveyors' Institution.—The first ordinary general meeting of the session will be held on Monday, November 14th, 1881, when the president, Mr. Edward Ryde, will open the session with an address.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,503. C. Gall, Halifax. Construction of safety apparatus and fasteners for windows, &c. Oct. 15, 1881.

4,511. B. R. Harrington, Beckenham. Ventilating gullies for drains. Oct. 15, 1881.

4,512. W. A. McCormick, Stoke Newington. Regulating the supply of water to water-closets, &c. Oct. 15, 1881.

4,526. P. Everitt, Great Ryburgh, and A. Barnard, Norwich. Stoves and grates. Oct. 17, 1881.

4,551. G. E. Waring, Newport, U.S.A. Water-closets. Oct. 18, 1881.

4,557. J. A. Hornby, Menai Bridge. Water-closets. Oct. 19, 1881.

4,565. W. M. Farley and J. H. Bond, Torquay. Apparatus for supplying dwelling-houses, &c., with water. Oct. 19, 1881.

4,566. W. A. Martin, Southwark. Open fire-grates. Oct. 19, 1881.

4,568. H. Skerrett, Birmingham. Combining door chains with lock, latches, and bolts. Oct. 19, 1881.

4,578. W. A. Barlow, London. Stoves. (Com. by F. Lonholdt, Frankfort-on-the-Maine). Oct. 19, 1881.

4,590. F. Wirth, Frankfort-on-the-Maine. Chimney-flues. (Com. by the Society "Gesellschaft des Emser Blei- und Silberwerks, Ems, Germany.") Oct. 20, 1881.

4,595. J. G. Shillingworth, London. Sash-fasteners. Oct. 20, 1881.

4,598. G. Pitt, Sutton. Water-closets. (Com. by J. Finck, Baden-Baden.) Oct. 20, 1881.

4,603. Capt. T. E. Clarke, Minehead. Fire-grates. Oct. 20, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

October 18, 1881.

2,809. W. Joy, Aylesford. Manufacture of cement. June 27, 1881.

3,250. D. Grove, Berlin. Steam-cooking apparatus. July 25, 1881.

3,357. C. Walton, Bournemouth. Apparatus for preparing clay, &c., and making bricks, tiles, &c. Aug. 3, 1881.

3,383. J. Shanks, Barrhead. Lavatories. Aug. 4, 1881.

4,001. J. Shanks, Barrhead. Baths, sinks, &c. Sept. 16, 1881.

October 21, 1881.

2,616. G. Hodson, Loughborough. Manufacturer of chimney-pieces, &c., in imitation of marbles, &c. June 16, 1881.

2,633. S. Hodgkinson, Manchester. Window-blinds. June 16, 1881.

3,630. C. Drake, Battersea. Facing bricks. Aug. 20, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending October 22, 1881.

747. H. Defty, Middlesbrough. Stoves.

The fire-grate is enclosed in a transparent shell or doors so that all air for combustion passes from the back or bottom to the grate. The ovens or boilers are placed above the fire, and a number of small chambers are arranged above to heat air which passes through them and can be led by tubes to any other room. (*Pro. Pro.*) Feb. 22, 1881. Price 2d.

969. R. Crane, Clapham. Grates and stoves.

The flues from the grate pass down again on each side under the bottom of the fire and thence up the back, whereby the smoke is consumed. March 7, 1881. Price 4d.

1,073. G. P. Lempriere, Birmingham. Mechanism for producing tension on the cords or bands of blind rollers, &c.

A helical spring is used, in the axis of which is a screw. The lower end of the spring engages in the groove between the threads of the screw. The upper end of the spring constitutes the axis on which the pulley turns. The screw and the greater part of the spring are contained in a case. By turning the screw a greater or less amount of tension is given to the spring and thereby tightens or loosens the cord. (*Pro. Pro.*) March 12, 1881. Price 2d.

1,091. A. M. Clark, London. Tiling for roofs, floors, &c.

Grooves are made all round the edges of the tiles; and metallic feathers, inserted in the grooves and bedded with elastic cement, connect the tiles together, keep them in their proper positions, and make the joints watertight. (Com. by J. J. Williams, Fairhaven, U.S.A.) March 14, 1881. Price 6d.

1,098. J. Elms, London. Water-closets.

A lower pan is fitted beneath the upper one, and a double-action crank, raised by the ordinary pull, opens the

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

upper one, and at the same time closes the lower one and *vice versâ*. The up-flow of noxious gases is thereby prevented. (*Pro. Pro.*) March 14, 1881. Price 3d.

1,112. S. C. Joyce, Wood-green. Surfacing asphalte, &c., to render the same slipless.

A diamond pattern is cut into the asphalte while it is warm. This is either left open or filled in with cement, &c. (*Pro. Pro.*) March 15, 1881. Price 2d.

1,142. R. Marshall, Wandsworth. Appliances for operating Venetian and other blinds.

To the top rail is fixed a bracket, which is slotted. In the slot is a spindle carrying the top and the other laths of the blind. The usual cords and wheels are in the top rail for raising or lowering the blind. (*Pro. Pro.*) March 16, 1881. Price 2d.

1,146. A. Sweet, Hampstead. Water-heaters.

The heater is a cylinder with an inner lining forming a waterway jacket. The water passing through this jacket overflows into one of a series of circular-bearing chambers falling through tubes from one to another, until it reaches the boiling-plate, when it is drawn off. The gasburner is composed of a series of rings, into which are screwed a number of fish-tail burners. A condensation-plate of fireclay is placed above these. March 16, 1881. Price 6d.

1,149. L. S. Powell, Notting-hill, and C. V. Boys, Oakham. Water-pipes.

These are made of elliptical section, so that under the strain produced by the freezing of the water, they will not burst, but yield; and after the strain is removed will return to their original form. (*Pro. Pro.*) March 16, 1881. Price 2d.

1,155. S. J. Payne, Charlton. Manufacture of fire-bricks, &c.

These are made of the following materials:—Clay, graphite, or sand, &c., 7 lb.; Portland cement or hydraulic lime, 1 lb.; silicate of soda, ¼ pint. These are thoroughly mixed and moulded into the desired shapes, and afterwards hardened. After this the goods are immersed in a weak preparation of carbonate of magnesia or silicate of soda. March 16, 1881. Price 4d.

1,171. J. H. Johnson, London. Cocks, valves, or apparatus for regulating the flow of liquids.

The main valve is closed by the pressure of the water in the pipe, and a small valve and passage are fitted to allow the water to enter the chamber below the main-valve piston, and by equalising the pressure to lift it off its seat when the water flows through the main valve. (Com. by J. Zelony, Prague). (*Pro. Pro.*) March 17, 1881. Price 2d.

1,193. W. S. Smith, Highgate. Locks.

To allow of a strong spring being used, a spring catch is combined with the lock which when the bolt is withdrawn by turning the lock handle, springs in front of the end of the bolt and prevents it from being again shot forward when the handle is released. (*Pro. Pro.*) March 18, 1881. Price 2d.

1,781. A. Bell, Edinburgh. Castors.

The castor is made in two parts. The upper part fitted to the leg of the table, chair, &c., and the lower forked swivelling bracket-piece carrying the roller. The upper part has a centre pin or stud, which fits a corresponding socket in the centre of the lower part. A pin passes through the socket and enters a groove formed round the centre pin and holds the two parts together. April 25, 1881. Price 4d.

"THE VICTORY OVER SEWER-GAS."

Sir,—As the opener of this discussion, I hope you will allow me to reply to Mr. Cosmo Innes's criticism in your last issue [p. 558].

1. As to the weight of sewer gas: that depends entirely upon circumstances, and varies in accordance with the cleanness or foulness of house-drains, soil-pipes, and traps under w.c.'s, so that the specific gravity is always varying; but what I contend is, that air impregnated with sewer gas is always heavier than fresh air, and that where there is a current of air either up or down a soil-pipe, its temperature varies but slightly from that of the surrounding atmosphere. The temperature in my soil-pipe this morning was 35 degrees, exactly the same as it was on my roof or the road adjoining my house, proving, I suppose, an entire absence of sewer gas.

2. The temperature of the main drain opposite Sir Henry Cole's house, taken in his presence this morning (Oct. 31st) at 9 30, was 45 degrees: so what the weight of carbonic acid gas at 100 degrees and the ventilation of monkey-houses has to do with this discussion I fail to perceive. I am not engaged in ventilating monkey-houses, so have no desire to dispute Mr. Innes' superior knowledge on that subject.

3. I have myself called attention to the different opinions of the doctors as to the general direction of the air in soil-pipes. Mr. Innes may read more fully in the report already alluded to viz., Conference, May 3rd and 4th, 1877, or, even in the *Builder* of last Saturday, Oct. 29th, p. 537, on the Sanitary Congress at Vienna, where Dr. von Roszahegyi, of Pesth, remarked that his own practical experiments led him to the conclusion that the air in drains is carried forward with the stream, while currents of air in a contrary direction are unfrequent and limited in extent, and no perceptible influence is exercised by wind, or by the temperature of the exterior air. Dr. Lissauer, of Dantzic, fully confirmed the preceding speaker's remarks; but I leave the doctors to differ, not feeling it any duty of mine to endeavour to reconcile their differences, though I feel sure the preponderance of scientific opinion is on my side in this controversy.

4. Mr. Innes says a better plan than mine would be to take it up a warm chimney. Does he not know that there is not one chimney in ten that is built straight enough to take an up-cast ventilating-pipe through, and when he had found one straight enough, he would find no room to spare for his pipe, and still less would he be able to get his pipe up, or make good any joints in it? A moment's reflection will convince your readers, both builders and architects, that the idea is impracticable; and as for carrying the sewer gas up the chimney without a pipe, let them read the short paragraph on "Defects in House Building," by R. K. Hervey, in the next page of the *Builder* to that on which Mr. Innes's letter appears (p. 559), and fancy the effects of sewer gas as well as smoke being constantly pouring into the house.

5. Mr. Innes himself admits all that I contend for, viz.,—1st. That the current up a soil-pipe (when it exists) is in the majority of cases a feeble one. 2nd. That the said current is reversed when the w.c.s are used, and a flush of water sent down the soil-pipe. 3rd. That the air thus reversed is poured out through its intended inlet in the front area; but he says this does no harm, because (mark you) it is not often that anybody is standing over it at the time; also because, if the pipes and drains are kept well flushed and clean, he (the poisoned one) will not perceive any smell. Is this the standard set up by the much-talked-of Sanitary Protection Association, to tolerate an imperfect system, on the chance that no one will be near when the poison is poured forth, or if any one is, then if the poison is very diluted he will not smell it? (I have never heard anything worse from the lips of a fourth-rate speculating builder.) If this is the best the London Sanitary Protection Association can do for us, then Heaven protect us from such protectors!

6. Mr. Innes thinks I am a practical man. I wish I could return the compliment. I should say that my theory is based on practice, and Mr. Innes's practice is based on theory. My practice has been on my own houses, at my own cost, and on my own responsibility. Mr. Innes's Association theorises at other folks' expense, and is not responsible for results.

Then, the bugbear of cost. The Association asks its members to pay a guinea per annum to be told, not what is best to be done, but what is cheapest and near enough (the gospel of shoddy speculation), but when I develop a plan by which the volume of air in the soil-pipes and house-drains can be changed two or three times per minute, with no reversal of the current induced, with both inlet and outlet above the level of all the windows, and by which the traps or cesspools under the w.c.s can be safely dispensed with, but which would cost from two guineas to two guineas and a half per annum (not for advice, but for continuous and efficient working), then it is found too expensive, and is compared to a steam-hammer to crack nuts with; but he admits that it does crack the nut, he admits that it is a victory over sewer gas, and that is sufficient for me. I contend that this nut has not been successfully cracked by any previous method.

In concluding this correspondence for the present, I may state that I shall be very pleased to show the system working at my residence, No. 97, Warwick-road, Earl's-court, S.W., to any one, architect or builder, who is desirous of seeing for himself, and wants the best thing; if, on the contrary, he wants the cheapest, then I am not in it, and it would be useless to trouble himself or me about it. I shall go on with my experiments, and if I meet with further success, you will probably hear of it.

G. E. Mineard.

Sir,—As a practical man of many years' standing, and one who has studied the subject of drainage and ventilation for more than twenty years, I can endorse every part of Mr. Cosmo Innes's statements, contained in your issue of the 29th ult., excepting that in addition to where the closets are in use, I have found the action of the air in the soil-pipe at times reversed; but, as he states, with no bad effect (when the work is done properly). I have stood over the inlet ventilator or sewer interceptor, as the case may be, in a confined yard when the closets were in action without experiencing the slightest smell; but as the result of a practical test,—that sewer-gas does generally ascend is fully proved by the fact that the tops of the closet-traps and outgoings (under the old system) are the parts first found to be perforated G. T. Usher.

COALS FOR DOMESTIC FIRES IN LONDON AND COAL MERCHANTS.

In offering some remarks on "Strawberry Leaves and Black Diamonds," I beg to say that I individually wish success to the venture of Lord Londonderry in bearding the London coal-dealing ring. I am not, however, satisfied that the Marquess will be allowed to hold his own, let alone win. Rings are not easily broken down.

In the first place I may remark that "Wallsend" is now a name,—nothing more,—the seams of coal at Wallsend having been worked out. The coal sent to London by the Marquess may, however, be of good quality for household purposes; but it will not be true Wallsend. Every London coal-dealer may, therefore, strike this term out of his list. "Silkstone" is a good coal for domestic fire purposes, and may take rank with the so-called Wallsend. There are, however, many varieties of coal, all differing in quality,—and of course, to the coal-merchant, in price. Some of these coals are wasteful and dirty, and the coal-merchants do not scruple to substitute the bad for the good, either wholly or by mixture.

I have been a resident and householder in London some thirty years, and up to this time have failed to find one consistently honest dealer, who would supply me with the best coal for the best price. I order and pay for Wallsend or Silkstone, and I may for a time obtain good and clean coal; but, sooner or later, when nine tons or twelve tons have been ordered, delivered, and paid for, they turn out to be dirty, dusty, white-ashy rubbish,—and I am fixed for the winter with coal at 24s. a ton which I would not give 15s. a ton for,—indeed, would not have in my cellar if I could help it. This is my condition at this time. The coals ordered and paid for were to have been Best Silkstone; they are simply rubbish. Of course, the dealer will have no further order from me, but by change I do not find permanent improvement. I therefore, with all my heart, wish success to the Marquess, but I see rocks ahead. The ring will resort to some dodge to reduce the supply the public should get. But suppose the sale is allowed to be open and fair, the demand will far exceed the power of supply, and orders must go unattended to, and, as waiting will not suit householders, they must go to the dealers.

It is really most disgraceful that in England a man cannot be supplied with what he orders, though he makes no demur about the price, and is prompt in payment, but must find his cellars filled with the commonest coals when he ordered and paid for the best. I suppose, however, that it is with coals as with many other things, there is not sufficient of the best to supply the demand. If this is so, the householder who has ordered the best should be told so, and should be honestly told what sort of coals he can have and the price. If then coals and price are accepted there can be no just ground for complaint.

A Cheated and Indignant Householder.

PAPERHANGING.

A correspondent, signing himself "An old D-Trap," writes:—As a paperhanger, although not the regular paperhanger, will you, through your many artistic correspondents, obtain for me some information about "Drop blocks," so wasteful, so very perplexing, and, shall I say, so outrageous; and it seems not to be confined to our own, but to French goods as well. How can it be prevented?

Another correspondent to whom the above was shown sends the following reply:—

Sir,—To make a design "drop" in the hanging is an expedient resorted to by most artists of experience to give greater interest to their designs, and to avoid the monotony of a constant repetition of the same form in unbroken lines all round a room. It has no influence whatever in causing waste; indeed, I am assured by a master paper-stainer of great experience, it most frequently is an aid to economy in quantity. The following instance is a case in point:—Assume that a room, 10 ft. 10 in. high, is to be covered with a design, 21 in. by 21 in. If it joins straight across, seven repetitions of the pattern must be cut to make one breadth, seven times 21 = 12 ft. 3 in., therefore the waste in every breadth is 17 in. If it "drops," 6½ prints (repetition) will be ample, the half print left at bottom of first breadth forming the top of the

second, and so on, the waste being thus reduced to only 6 in. in each breadth.

There can, of course, be no arbitrary rule, rooms being of all heights, and designs of all dimensions, the example taken being the standard size for good patterns. Any one who will work the simple problem for himself with designs of other sizes will find very similar results.

If the first breadth of a drop pattern fits the wall without any waste, "the regular paper-hanger" cuts half a print off the top of every second piece, not breadth, and that is all the waste involved, which is practically very little.

The idea that waste is occasioned by a "drop" pattern being a very prevalent misconception, I am pleased to have the opportunity to assist in removing it.

GEO. C. HAITE.

SMOKY SMELLS.

SIR,—In reply to R. K. Hervey's letter [p. 559], we may say that a similar job to that mentioned by your correspondent came under our notice about four months' back. On examination we found the joints to the 4½-in. brickwork forming the front of the flue very defective, and made worse by the carpenter driving a plug wherewith to fix the skirting-grounds when the work was green. We would recommend your correspondent to have the skirting and grounds taken down to the side wall containing the flues, also the flooring adjoining; cut the joist out should it run lengthways and close to the wall. Then carefully connect the plastering of the lower room to that of the upper. Take out the stove and mantle, render the wall at the back of the same, and as high up the flue as a man can reach; replace all disturbed, and his trouble (minus the builder's bill) will be at an end.

WILKES BROS.

THE GALE OF THE 14TH ULT.

SIR,—The paragraph in your last issue [p. 557] does not show the full gravity of this storm in relation to dangerous structures and loss of life. When a building, chimney, or wall is blown down, it very possibly ceases to be dangerous, and so fails to receive notice in that sense. In my district, the heavy parapets of four houses were blown over into the forecourts; a garden-wall was blown over, with the loss of one, if not two, lives; and several chimney-stacks were thrown down, breaking through more or less into the bedrooms. In one case, the slates were blown from a large roof, and, for the time, had possession of the street and adjoining gardens for a length of 100 yards. Yet I have only had to report upon three dangerous structures arising out of these matters, and, at this rate, the number of 100 reported at the Board of Works would represent several hundreds of accidents more or less dangerous to life.

The lesson we learn from these events is that much greater care is required in executing brickwork, slating, &c., in exposed situations, as well as care with respect to buildings that show signs of insecurity; for there is little doubt that, should a similar gale spring up from the opposite quarter, we should have a similar list of casualties to that now in question.

THOS. BLASHILL,
District Surveyor, Bethnal-green East and South Bow.

HOT-WATER PIPES IN LIBRARIES.

SIR,—I should feel obliged for an opinion from those who have had experience in the heating, by the hot-water system, of public and other libraries, whether any and what objection has been found to arise from the heat given off by pipes running round the room, close to the lower shelves containing books? And what effect has this system on the air of a room where the supply is given by windows and doors only? Would it not be better to place the hot-water pipes in the form of coils in the centre of the rooms, so that the binding of the books would not be affected by nearly immediate contact with heated pipes?

H. W. P.

BROMLEY SEWERS.

SIR,—At page 559 of the *Builder* of the 29th of October, you state that serious charges are made against me to the effect that certificates have been given and moneys paid for work not done to a large amount. I deny having done anything of the kind. A list of that portion of the sewers executed under my supervision is in the hands of the Bromley Local Board; and I court the fullest inquiry as to their value. May I ask you to insert this in your next?

JOHN GARTON.

ACCIDENTS FROM LIGHTNING IN GERMANY.

A TREATISE recently published in Germany by Dr. Holtz, of Greifswald, deals with the question of the progressive increase of cases in which buildings are struck by lightning.

The general results of Dr. Holtz's investigations are thus summed up by the *Rheinische Courier*:—

1. There has not been an increase of storms, nor is such to be apprehended in the future.

2. The increased danger from lightning arises from various causes, such as the continued destruction of woods and trees in the vicinity of inhabited districts. Formerly the numerous tops of trees, &c., served to divide the electricity. Another reason is the increased use of dangerous appliances in and about buildings.

3. These causes being strictly telluric and not atmospheric, and being constantly extending the sphere of their action, a proportionate increase of danger from lightning is to be expected in the future.

4. It is therefore necessary for the use of lightning conductors to be extended, and for the planting of trees to be encouraged. The use of dangerous appliances should also be, as far as possible, diminished, and the destruction of woods be restricted in some way.

The technical press of Germany has given currency to the opinions of Dr. Holtz, which open an interesting field for discussion on a matter of general importance.

TESTING TRAPS.

SIR,—Replying to your correspondent, Mr. Rankin [p. 560], I must in the first place remind him that during the whole of Mr. Hellyer's lectures no mention whatever was made of the momentum of the water in traps. The greater part of the experiments were arranged with a view of testing siphonic action. These two principles are governed by two distinct laws, and have no action in common. It must be remembered also that the experiments placed before the audience at these lectures were not so fixed as to display to those present the momentum of the water, or, in other words, make itself evident, neither was it anticipated.

With regard to the remark that I am eating my own words, I regret to say that there is some truth in it. I judged the "Eclipse" trap theoretically, but having some doubts about it applied the practical test. I must, therefore, apologise to my readers for having (though only slightly) misled them, and as Mr. R. doubts the truth of my assertions as to the action of this trap, he should have availed himself of the opportunity offered to test them for himself. I now repeat my assertion that on this point the action of the "Eclipse" trap is the same as the $\mathcal{O}$, as on reading Mr. Rankin's letter I again put the traps to the test on last Saturday afternoon, in presence of Mr. G. Davis (foreman to Mr. G. Jennings), Mr. J. Harsant, Mr. R. Panario, and several other soundly practical men of the trade.

As I have not seen the letters of Mr. J. Smeaton and Mr. D. Emptage, I cannot reply to them in detail, but think it probable that this will reply to the whole.

P. J. DAVIES.

ENGINEER AND CONTRACTOR.

SIR,—In your issue of the 22nd October, we observe an instance of one and the same gentleman figuring concurrently as Engineer to the Sewerage Scheme of a Somersetshire town, and as the successful competing contractor for a small road and sewer-making job in the neighbourhood of London.

Doubtless the Somerset Local Board is in happy ignorance of the Admirable Crichton-like qualities of its adviser, while on the other hand the directors of the Land Company that wants its road made, may, with readier means of information around them, be congratulating themselves on having met with a real live civil engineer of modesty sufficient to take work from them as a mere contractor.

And yet we, sir, as contractors,—pure, if not simple,—are dissatisfied with such a state of affairs, and address you to draw attention to the anomaly. We should like to have been among the competitors for the works of the Somersetshire town; but we cannot with justice to ourselves submit a tender to the judicial scrutiny of a gentleman who to-morrow may be in competition against us.

CONTRACTORS.

AN EAST END BRIDGE.

IF a bridge were built over the Thames where it is half a mile wide a rise of 1 in 20 would make the centre arch 86 ft. higher than the carriage way at the foot of the bridge. This added to the height at the foot of the bridge above the water level would make up enough height for ships to sail under the centre arch. Such a bridge might be built from Tilbury to Gravesend, and establish the much-needed communication between Essex and Kent. Where the river is only 1,320 ft. wide, the approach on each side might begin 66? ft. inland on each side, so as to gain the same rise. This could be done a very short distance below London Bridge.

A third alternative, which could be carried out anywhere, would be to build a diagonal bridge intersecting the river at such an angle as would give the rise required. Such, as for example, from Tower Hill to Rotherhithe.

W. SCARGILL.

The Padiham Local Board have decided to apply to Parliament for power to construct a new reservoir at Churn Clough, to hold 100,000,000 gallons, at a cost of 40,000*l*.

PROVINCIAL NEWS.

Hereford.—The 500th anniversary of Hereford Cathedral school has been celebrated by commencing the erection of a school-library in memory of the founder, Bishop Gilbert. In addition to the library two new class-rooms are being added, and arrangements are being made for isolating boys in case of illness. The works are being carried out from designs of Mr. Kempson, architect, and the contractor engaged is Mr. Cullis, of Hereford.——Three richly-carved Glastonbury chairs, designed by Mr. Kempson, have been presented to the chapel at the Hereford County College, by the Dean of Hereford. The carved work has been executed by Mr. Robert Clarke.

Lincoln.—The new road,—henceforth to be known as Yarborough-road,—on the west side of the city, connecting the West Parade (late Brick-yard-lane) with the Burton-road, was opened on the 19th ult. Hitherto, the only available route into the lower part of the city from the north-west district, at least for heavy traffic, has been *viâ* Rasen-lane, Church-lane, Minster-yard, Pottergate, New-road, and Silver-street, the Asylum-road being far too steep to be of much service for vehicular traffic. The new road is about 1,300 yards in length, and 40 ft. wide throughout. The steepest gradient is one in sixteen, the average being one in twenty-three. The work has been carried out under the direction of the City Surveyor, Mr. J. J. Henderson.

Liverpool.—At the meeting of the Health Committee of the Corporation of Liverpool, on the 20th ult., Mr. J. Barkeley Smith, the deputy-chairman, made a few remarks on the amount of work done by the committee during the year. The engineer informed him that in his department twelve miles and a half of tramways, including reconstruction and extensions, had been executed; 19,000 square yards of impervious paving had been laid on carriageways outside the tramway limits and in other streets throughout the city. The expenditure on paving works and tramways, &c., amounted to 200,000*l*. In the sewage department four miles of sewers were repaired, four miles of new sewers constructed, twenty-three miles of sewers ventilated, 500 ventilators fixed and manholes brought to the surfaces, 18 miles of public sewers cleansed, 1,325 loads of deposit removed, and 66 miles of public sewers flushed. The total expenditure in the sewerage department was 35,000*l*. The sewerage inspectors visited 10,000 places where complaints were made of defective drainage. The work of the building surveyor's department included the erection of 1,795 houses, 325 alterations of houses, 31 warehouses erected, and 164 workshops erected. In regard to 2,516 dangerous buildings, notices were served, besides 2,000 miscellaneous notices. The committee had every reason to be satisfied with the way in which the engineer's work was done. He was glad to find that their exertions to reduce the death-rate in the city had met with success. The death-rate during the year had been 26·2 per 1,000. The death-rate for the previous five years,—1876 to 1880,—was 27·5 per 1,000, and that for the five years from 1871 to 1876 was 29·5 per 1,000.

Hanley.—Mr. Harrison, C.E., from the Local Government Board, attended at the Town Hall on the 21st ult. to hold an inquiry in reference to an application of the Corporation to borrow 3,000*l*. for paving roads, 2,000*l*. for street improvements, and 600*l*. for a steam roller. The inspector reduced the item for a steam roller to 450*l*.

Great Yarmouth.—The Lands Committee of the Corporation of Great Yarmouth have resolved to subscribe 30,000*l*. towards the proposed docks near the entrance to the harbour. The area will be about ten acres and a half, and the cost, exclusive of land compensation, sidings, and warehouses, 70,000*l*. The docks will be 1,100 ft. long, and 400 ft. wide, with a depth at high water of 24 ft., and 18 ft. at low water. The length of quayage will be about 4,000 ft.

Wolverhampton.—Important alterations in the sanitary arrangements of the Wolverhampton and South Staffordshire General Hospital have just been completed. The hospital has been extended at various times, but these additions, it is said, intensified the sanitary defects of the building. Thus, the main drain was carried below the floor of the building, and beneath the out-patients' wing and the new laundry was an old culvert which carried the sewage into the town drains. These have all been taken up, and a new system of drains has been laid down, which are quite clear of all the

buildings. All the soil and waste pipes, as also the rain-water down-pipes, have been removed from inside, brought down outside, and ventilated, the whole of the waste-pipes being disconnected from the drains by open traps, and the soil-pipes carried above the roof. The whole of the work has been carried-out from the plans and under the direct superintendence of Mr. Geo. Hurst Stanger, C.E., the engineer to the Wolverhampton Sanitary Protection Association. The contract for the drainage has been carried out by Messrs. Horsman & Co., of Wolverhampton; and the contracts for the plumbing have been executed by Mr. E. Jones and Mr. J. Atherton, of Wolverhampton.

CHURCH-BUILDING NEWS.

Lockwood, Huddersfield.—Emmanuel Church has just undergone considerable improvements, including the erection of a carved memorial oak pulpit, in the Decorated style, with the top of open tracery work, filled in with brass grilles. An ornamental reredos is also among the work, which has been executed by Messrs. Jones & Willis.

Colchester.—The repair of the Church of St. Martin, Colchester, is now about to be commenced. This beautiful and interesting church has in the course of years been reduced to a state bordering on ruin. It was inspected by the members of the Royal Archæological Institute on the occasion of their visit to Colchester in 1878, and, at the suggestion of the late Sir G. G. Scott, the chancel ceiling was stripped and the fine fourteenth-century roof exposed to view. The present repairs are confined, for lack of funds, to the work most urgently required to preserve the fabric from the effects of the weather, and include the removal of ceilings and the opening and repair of roofs. The works are under the direction of Mr. E. J. Dampier, of Colchester, the contract being taken by Messrs. Gardner & Son, of Coggeshall.

Cannock.—On the 21st ult. the memorial-stone of the new parish Church, Cannock, now being rebuilt, was laid. The contract for the work has been taken by Mr. Thomas Williams, of London, for 2,430*l.* and he is carrying out the work under the superintendence of the architect, Mr. Nicholas Joyce, of Stafford. The church, dedicated to St. Luke, is of ancient date. It consists of a nave, with north and south aisles, chancel, and western tower. The nave appears to have undergone considerable alteration at the time the south aisle was built in 1753. A great part of the north aisle was rebuilt in 1849. The chancel was the oldest part of the church, in the style of the first half of the fourteenth century, but this had been altered considerably since its erection. Evidence of its having had three different roofs is found by grooves on the east wall of the nave. The last was a modern hipped roof, by which the building was much disfigured. In order to effect the desired enlargement of the church, the entire removal of the chancel was unfortunately inevitable. This will be re-built further eastward, and the style of architecture of the old chancel has dictated the character of the whole of the new work. Two new bays, each about 15 ft. wide, will be added to the length of the old nave and aisles, affording additional accommodation for 240 persons. The western tower will remain as at present, except that the parapet will be repaired and the old angle pinnacles, which are now wanting, will be replaced.

St. Ewe, Cornwall.—The parish church has been recently re-opened after renovation. The architect was Mr. James Piers St. Aubyn, of London. The building exhibits many interesting features, and, unlike West-Country churches generally, has a western spire. The old wagon-headed carved oak roof of the south aisle, and those in the north transept and porch, have been restored; whilst the chancel, nave, and south aisle, have been newly covered. Most of the windows are new, and are in "Wild Duck" stone. Encaustic tiles line the avenues and the chancel floor. There is a new parclose-screen, and the church is seated generally by open benches. The windows are filled with stained glass, by Messrs. Heaton, Butler, & Bayne, of London, and Messrs. Fouracre & Watson, of Plymouth. The chief feature of archæological interest in the building is the exceptionably fine old Perpendicular rood-screen. This is of carved oak, groined on both sides, and full of much handsome detail. Screens of this sort, although common in several of the western counties, are rare in Cornwall. The screen has been underpinned, and a new sill put in; it has been lengthened a bay at each end. Mr. Harry Hems, of Exeter, was entrusted with this work. The general contract, amounting to 2,500*l.*, has been carried out by Mr. William May, builder, of Pool, near Camborne.

STAINED GLASS.

Warminster.—A stained-glass window has been placed in the Chapel of St. Boniface, Warminster. The subject represented is the "Crucifixion," with the figures of St. John and the Virgin Mary at either side. The window is from the studio of Mr. Charles Evans, of Fleet-street, London.

Mitcham.—A painted window has lately been erected in the north aisle of Christ Church, Mitcham, to the memory of Mrs. Ann Nobes. The subject is "Charity distributing her Gifts to the Poor," and underneath it is the appropriate text, "I was an hungered, and ye gave me meat." An ornamental canopy and base are introduced. The window, has been designed and executed by Mr. Charles Evans.

Brighton.—On the 7th ult. a five-light window was placed in the chancel of All Saints' Church. The centre light contains the figure of our Saviour. On each side are figures of the evangelists. The tracery is filled with foliage work, and emblems of our Lord's Passion. The window was the gift of members of the congregation. In the south aisle of the same church is a three-light window, and tracery containing the subject of "Christ healing the Sick." The window is the gift of the curate, the Rev. F. L. Meares. Both windows were designed and executed by Mr. Geo. Rees, Lamb's Conduit-street.

St. Leonard's-on-Sea.—The large east window of St. John's Church has recently been filled with stained glass. The subject represented is the Crucifixion, with the Magdalene kneeling at the foot of the Cross; while on either side are standing figures of St. John and the Virgin Mary, and the two pillars of the church, St. Peter and St. Paul, as expounders of Christ's teaching. Under each of the lights are subjects relative to the life of St. John. There are angels at the top of each light looking towards the figure on the cross. The window was designed and executed by Messrs. Heaton, Butler, & Bayne, of London.

Combmartin (North Devon).—A memorial window has just been placed by Mr. James Staples at the east end of the chancel aisle of the parish church. It is a lofty window, with four lights. In the tracery are the figures of the four great prophets, and above them two angels. In the two middle lights are represented the Ascension of our Lord and the Last Supper; in the left-hand light the Call of St. Peter from his Boat and Nets; and under this, his Receiving the Keys. In the right-hand light is represented the Descent of the Holy Spirit on the Day of Pentecost, and below this St. Peter preaching. The window is the design and work of Messrs. Lavers, Barraud, & Westlake.

Books.

The Book of Scales. By Ambrose Wheeler Holohan. London: Longmans, Green, & Co. 1881.

This book is principally designed for the use of students preparing for entrance into the Royal Military Academies at Sandhurst and Woolwich, but will be found of service by architects' and engineers' assistants also. It gives a larger number of examples, and is more illustrative, than any previous treatise on the subject that we remember.

VARIORUM.

We have before now spoken of the usefulness of Dr. Wershoven's "Technical Vocabulary, English and German." The same publishers, Hachette & Co. (King William-street), have now issued a similar little volume in English and French,—"Technical Vocabulary, English-French, for Scientific, Technical, and Industrial Students." This will be found useful in technical schools, and by many persons besides. It is divided into subjects; and a French index and an English index at the end increase its availability.——"The A B C of Gothic Architecture," by John Henry Parker, C.B. (Parker & Co.), is intended as an introduction to the author's well-known larger works on the same subject. It is written simply, very fully illustrated, and should get into schools. We quite agree with the author that knowledge of this kind acquired in early days will be found useful in after-life, and is seldom forgotten.——"Luxury, Ancient and Modern," in the current number of the *Quarterly*, is a most agreeable piece of reading. The writer ends by boldly declaring "that we are better than our forefathers." A much worse case against the present time, however, could be made out than he presents.——In the new number of the *Nineteenth Century* the Rev. Canon Venables re-urges his opinion that the style of the new cathedral for Liverpool should be Classical, not Gothic, and that Sir Christopher Wren's original design for St. Paul's, with certain modifications, should be adopted. A poem by Mr. Tennyson in this number of the Review will probably take it through two or three editions.——*Knowledge* is the title of an illustrated magazine of science, edited by Mr. Richard A. Proctor, of which the first number is published. It is intended to bring the truths, discoveries, and inventions of science before the public in simple but correct terms,—to be, in fact, the minister and interpreter of science for those who have not time to master technicalities (whether of science generally or of special departments), and will cost but 2d. Messrs. Wyman are the publishers. It ought to succeed.

Miscellanea.

The Tunnel under the Severn.—The Great Western Company's tunnel, four miles and a half long, under the Severn,—which is to be the new highway of traffic from South and Mid-Wales,—is progressing more satisfactorily than at any previous period. The streams of water which flooded the heading, and suspended operations there for a time, have been confined to manageable limits, and the difficulty of ventilation is also overcome. The working of the exhaust-system is so successful that at nearly a mile from the mouth of the shaft the air is fresh and agreeable, and blasting can be done without any danger to the workmen. The engineer anticipates that the tunnel will be completed within five years. It is stated that a good many geological secrets have been discovered while the work goes forward, and among them this, that a spring cut in driving the heading,—full 40 ft. below the Severn,—drew its waters from strata containing very large deposits of salt.

Stonehaven (N.B.).—St. John's Chapel has been re-opened, after alterations. The building was erected in 1859, and was the gift of the late Mr. John Beattie, Stonehaven. The alterations have added considerably to the sitting accommodation in the church. The work has been carried out from the designs and under the personal supervision of Mr. John Watt, Fetteresso, and the contractors for the work were:—Messrs. Gregory, mason; James Murray, jun., carpenter; James Burness, plumber; George Valentine, slater; Alexander Cormack, plasterer; and G. R. Taylor, painter and glazier.

The Whitmore Memorial, Bridgnorth, has been unveiled. It consists of a fountain, surmounted by the figure of Sabrina (goddess of the Severn), in bronze. There is a bronze medallion of the late Mr. Henry Whitmore, who was member for Bridgnorth in five Parliaments, Lord of the Treasury, and Keeper of the Privy Purse to the Prince of Wales. The Whitmore family were proprietors of Apley, and the greater portion of Bridgnorth, for many centuries.

Messrs. Unwin's Premises, Blackfriars. In the account which we gave of these new buildings on the 1st ult., we spoke of the very good basement which they contain. We may add that this is exceedingly well lighted by the use of Messrs. Hayward Bros. & Eckstein's pavement lights, which have given perfect satisfaction to the owners.

Royal Institute of British Architects.—The opening meeting of this Institute for session 1881-82 takes place on Monday evening next, the 7th inst., when the president, Mr. Street, R.A., will deliver an inaugural address.

Newton, Chambers, & Co. (Limited).—The Directors give notice that no further application for shares in the new company will be received after Thursday next, the 10th inst.

West-street Wesleyan Schools, Leek.—Extensive alterations and improvements have been made in these premises. In the large room on the first floor, for instance, used for public purposes, an orchestra, of amphitheatrical form, has been introduced, giving accommodation for a large chorus, and at the opposite end a gallery supported on pillars has been erected, increasing the seating capacity of the room. The old low flat ceiling has been taken out, and the roof timbers wrought to show themselves constructively. There are now in all twenty-six class-rooms for separate teachers, as against ten on the former arrangement. The larger ones are about 24 ft. by 20 ft., and the rest about 15 ft. by 13 ft. This increase will relieve the large room of the class-teaching on Sundays; and it will be used on that day for the general assemblages of the scholars. The works have been carried out to the plans and under the superintendence of Messrs. William Sugden & Sons, architects, Leek. The contractor was Mr. T. S. Bromage; and the painting and plumbing have been done by Mr. H. Stevenson. Mr. Mark Sutcliffe has fitted up the hot-water system; and Messrs. Gent, the electric bells.

Iron under Fire.—The London Stereoscopic and Photographic Company have published three excellent photographs of Messrs. Foster & Co.'s premises in Cheapside, burnt out in September last, and which serve to show the remarkable way in which the ironwork resisted the fire on that occasion. The fire at these premises, it will be remembered, was of a very extensive nature, and the contents of the building were of a very inflammable description. The columns, moreover, were all fully exposed to the action of the fire, as they had no coating (except the paint). The construction adopted by the architects, Messrs. Ford & Hesketh, appears not only to have thoroughly tied the walls together, but probably was the means of preventing the entire collapse of the building during the progress of the fire. The architects might usefully give a full account of the work. The ironwork was supplied by Messrs. Measures, Bros., & Co., of Southwark-street.

Native Guano Company's Show at Aylesbury.—On Wednesday last week this Company held their first show of farm and garden produce at their Sewage Works at Aylesbury, when a company of gentlemen assembled to witness not only the system pursued by the Company in dealing with the raw sewage of the town of Aylesbury, but the products derived from the use of their manufactured native guano. The visitors were struck by the extraordinary size and quality of the productions. The total number of specimens on view was 6,777. The mangels were of excellent quality, as were also the swedes, and called forth keen competition between the farmers of the Vale of Aylesbury. At a luncheon, given in a marquee on the ground, several practical farmers bore testimony to the high fertilising character of the Native Guano Company's manure.

Large Map of France.—The French War Office is preparing an elaborate map of France, on a scale nearly twice as large as that of the Staff map at present in use in the army, the result of a survey specially made by military officers. The sheets, some of which are already completed, are to be engraved by the zinc process. By the use of a great variety of colours much practical information will be afforded, such, for instance, as the condition and elevation of the roads, while even the existence of meadows and vineyards will be noted for the first time.

The Roman Villa at Wingham.—In the Roman villa discovered at Wingham by Mr. George Dowker, the portions brought to light recently are worth inspection. Two of the rooms have ornamented tesselated pavements, and a third, which appears to have been a bath, is decorated also upon the walls with tesselated work in black and white, of which it would be difficult in this country to point to another example. Wingham is only about two miles from the Adisham-road Station on the London, Chatham, and Dover Railway.

Bequest.—The late Mr. William Ward (who died on the 26th of October) has bequeathed the sum of 100*l.* as a legacy to the Builders' Clerks' Benevolent Institution. Mr. Ward was the uncle of Mr. Thomas Peto Ward, the founder of this excellent charity, and the above bequest is the first that has been made to its funds.

Rettie's Patent Scaffold Fastener appears to be getting into use, and, as it seems to us, deserves to do so. It is simple and durable, and saves labour.

Cheadle.—Certain alterations are in progress at the Primitive Methodist Chapel, Cheadle. The chapel will be re-seated in varnished woodwork, and a panelled wall dado will be formed out of the old seat-framing, and painted a dull green. A double vestibule entrance is being built at the front, carried up one story only, and finished with an inscribed pediment and balustrade; above which the main wall (with three-light window) sets back. Internally, the present flat plastered ceiling is stripped off and the timbers of the roof encased with reed boarding, considerably increasing the cubical content. The addition of a small porch at the back will protect the entrances to schoolroom and chapel at this end from cold draughts. The schoolroom on side of chapel is divided from it by a balustraded arcade with sliding shutters, as it is intended to form part of the chapel at large gatherings. The total cost will be about 500*l.* The builders whose tenders have been accepted are Messrs. Samuel Waugh, William Ball, and William Shufflebotham, all of Cheadle. Messrs. William Sugden & Son, of Leek, are the architects.

Builders' Benevolent Institution.—The offer of a hundred guineas, made by an old friend of this Institution, if twenty other friends would give ten guineas each, has been nobly responded to, *three times* that number having sent in their names. The annual dinner took place on Thursday, the 3rd of November, Mr. George Burt, J.P., in the chair. The total amount of the subscriptions and donations announced during the evening was 1,436*l.* 7*s.* 6*d.*, including the hundred guineas referred to and one hundred guineas given by the Chairman. We reserve our report for next week.

Hereford Surveyorship.—Mr. Kenworthy, mentioned in our last as one of the selected, wishes it to be stated that upon ascertaining that private practice was not allowed, he immediately withdrew his name from the election and did not attend the meeting.

The Artisans' and Labourers' General Dwellings Company have purchased a new estate of about ninety-eight acres at Hornsey. The directors are now considering plans for the development of the estate.

TENDERS

For cast-iron, earthenware and brick sewers, and other works at the Sutton Coldfield Sewerage Works. Mr. E. Pritchard, engineer. Quantities by Mr. E. J. Parnell. Contract No. 1.

Wilkes & Co., Bishopsgate, E.C.	£28,653	0	0
Bottoms Bros., Batterseа	21,500	0	0
W. Scott, Newcastle-on-Tyne	20,472	0	0
G. Hunter, London	17,590	8	2
McKenzie, Williams, & Co., Moorgate-street, E.C.	17,053	0	0
Nelson & Co., York	16,289	0	0
Ford & Everett, Westminster	15,950	0	0
W. J. Botterill, London, E.C.	15,624	0	0
W. Lean, Gloucester	15,283	0	0
T. Kirk, Chester	14,700	0	0
Hill Bros., Beckenham, S.E.	13,991	0	0
W. Holland, Leicester	13,900	0	0
J. W. Pickthall, Bromsgrove	13,699	0	0
J. Evans, Walsall	13,000	0	0
Currall & Lewis, Birmingham	12,989	0	0
Hilton, H., Birmingham	12,983	0	0
G. Law, Kidderminster	12,577	0	0
J. M. Smith, Westminster	12,550	0	0
A. Palmer, Birmingham	11,990	0	0
J. Fell, Leamington (accepted)	11,981	0	0
Engineer's estimate	12,836	5	6

For cast-iron pipes and special castings.—Contract No. 2.

T. Piggott, & Co., Birmingham	£1,085	0	0
Cochrane & Co., Dudley	1,008	0	0
Butterley & Co., Westminster	957	0	0
Staunton Iron Co., near Nottingham	913	11	0
C. E. Firmstone, & Bros., Stourbridge	831	0	0
J. & S. Roberts, West Bromwich*	828	0	0

* Accepted.

For alterations and additions to premises in King Henry's-walk, Balls-pond. Messrs. Anderson & Doubleday, and Mr. John Johnson, joint architects. Quantities supplied by Messrs. Maughan & Curzon:—

Clarke & Bracey	£1,132	0	0
Clemence	1,080	0	0
Lawrance	1,070	0	0
Falkner	1,066	0	0
Boyce	1,044	0	0
Macey & Sons	1,027	0	0
Conder	997	0	0

Accepted for the erection of a new chapel at Smyllum Orphanage, Lanark. Messrs. Pugin & Pugin, architects. Quantities by Mr. E. J. Harris:—

Excavator, Mason, and Bricklayer.

Ebenezer McMorran, Carstairs Junction	£954	0	0

Carpenter, Joiner, and Ironmonger.

John Baxter, Glasgow	£668	9	11

Slater and Plasterer.

Thomas Glaister, Lasark	£238	4	7

Plumber, Painter, and Glazier.

Proctor & Son, Biggar	£145	0	0

For extension and additions to the Army and Navy Stores, Westminster. Mr. James Knowles, architect. Quantities by Messrs. J. & A. Bull:—

				Months.
McManus	£27,950	0	0	12
Nightingale	25,916	0	0	9
Burmish & Foster	25,350	0	0	20
Kirk & Randall	24,935	0	0	10
Oldrey	24,833	0	0	16
Perry & Co.	24,105	0	0	9
Killby	23,905	0	0	8
J. H. Brass	23,820	0	0	11
Baags & Co.	23,815	0	0	10
Langmead & Way	23,780	0	0	12
Williamson	23,679	0	0	9
Morter	23,515	0	0	8
Hook	23,450	0	0	9
Brass	23,391	0	0	8½
Beale	23,363	0	0	8
Higgs & Hill	22,949	0	0	5½
Lawrance	22,772	0	0	9
Clark	22,170	0	0	—
Mowlem & Co.	21,940	0	0	18
Stephens & Bastow	21,000	0	0	15
Shaw	20,235	0	0	12
Martin, Wells, & Co.	20,0 0	0	0	6
Patman & Fotheringham	19,775	0	0	8
J. O. Richardson	18,838	0	0	12

For new schools at Heber-road, East Dulwich, for the School Board for London. Mr. E. R. Robson, architect. Quantities by Mr. Ch. W. Brooks:—

T. G. Wood	£11,775	0	0
W. Brass	11,091	0	0
Higgs & Hill	11,480	0	0
Perry & Co.	11,496	0	0
C. Wall	11,026	0	0
J. T. Chappell	11,012	0	0
J. D. Hobson	10,946	0	0
Stimpson & Co.	10,928	0	0
W. Shepherd	10,841	0	0
B. E. Nightingale	10,781	0	0
W. Downs	10,742	0	0
W. Oldrey	10,679	0	0
W. Tongue	10,619	0	0

For new schools at Homerton-row, Hackney, for the School Board for London. Mr. E. R. Robson, architect Quantities by Mr. T. Thornton Green:—

W. Brass	£13,474	0	0
Higgs & Hill	13,240	0	0
T. G. Wood	13,114	0	0
W. Oldrey	12,594	0	0
G. S. Pritchard	12,588	0	0
E. Lawrence	12,582	0	0
G. S. Williams	12,412	0	0
J. Grover	12,176	0	0
C. Wall	11,401	0	0

For the supply of materials, and the execution of the general works in "District B" of the Metropolis, for periods of one, two, or three years, for the Metropolitan Board of Works. Sir Joseph Bazalgette, engineer:—

		Above Schedule Prices.	Below Schedule Prices.
Williams, Son, & Wallington	1 year,	7½	—
	Ditto 2 years	6½	—
	Ditto 3 ,,	4½	—
Martin, Wells, & Co.	1 year	5½	—
	Ditto 2 years	2½	—
	Ditto 3 ,,	— (at schedule prices)	—
Ford & Everett	1 year	—	5½
	Ditto 2 years	—	5½
	Ditto 3 ,,	—	5½
George Butler*	1 year	—	7½
	Ditto 2 years	—	7½
	Ditto 3 ,,	—	7½

* Accepted for one year at 7½ per cent. under schedule prices, and promised to be continued for two years further if first year's work is satisfactorily performed.

For alterations and additions to Durham House, Southfields, Wandsworth, for Mr. Frederick Stroud. Messrs. Humphries & Co., architects:—

Adamson & Sons	£790	0	0
Henry Scott	776	15	0
Turtle & Appleton	650	0	0
James Foice	640	0	0
J. Sutton (accepted)	560	0	0

For three shops and dwelling-houses in Catherine-street, Salisbury, for Mr. James Lywood and Mr. John Walker. Mr. Fred. Bath, architect. Quantities supplied:—

John Wort, Salisbury	£3,844	2	6
Philip Tryhorn, Salisbury	3,265	0	0
Dolman & Harris, Salisbury	3,195	13	—
Young & Sons, Salisbury	3,035	0	0
Edward Abley, Salisbury (accepted)	2,960	10	0

For corn warehouse, stables, and outbuildings, Sparoad, Bolton, for Messrs. R. Byers & Sons. Quantities supplied. Mr. T. Ormrod, architect:—

Excavation, Brickwork, and Masonry.

Contract A.

Brown	£834	0	0
Smithies	822	0	0
Fletcher	788	0	0
Bradbury	787	0	0
Merrick (accepted)	770	0	0

Joiners, Slaters, Plumbers, Glaziers, and Painters' Work.

Contract B.

Roberts	£651	5	0
Skinner	550	16	0
Townson	550	15	0
Burrows & Son	539	0	0
T. W. Taylor	530	0	0
W. & L. Marsh (accepted)	502	10	0

Ironwork to Warehouse, Floors and Roofs, and Concrete Floors.

Contract C.

Swarbrick & Co.	£1,064	19	0
Homan & Rodgers (partly accepted)	937	0	0

Note.—Excavation and Basement to Warehouse.—Separate Contract under Schedule.

W. Aspinall	£256	0	0

For building "Emanuel Schools," Forest-gate. Messrs. Habershon & Fawckner, architects. Quantities by the architects:—

Cass	£1,654	0	0
Allen & Son	1,630	0	0
Beale	1,592	0	0
Staines & Son	1,572	0	0
Gregar	1,540	0	0
Balsam Bros.	1,540	0	0
Garrud	1,483	0	0
Castle	1,480	0	0
Priestly	1,469	0	0
Battley	1,450	0	0
Johnson	1,447	0	0
Hooper	1,435	0	0
Johnson	1,429	0	0
Warr	1,427	0	0
Pack Bros.	1,420	0	0
Maton	1,395	0	0
Jones	1,385	0	0
Crisp & Tomlin	1,353	0	0
Richardson	1,339	0	0
Evans	1,359	0	0
Higgs	1,338	0	0
A. S. Judd	1,330	0	0

For the first and second sections of the restoration of St. Martin's Church, Colchester. Mr. E. J. Dampier, architect:—

Oldridge	£778	0	0
Dobson	740	0	0
Dupont	695	0	0
Gardner & Son (accepted)	651	7	0

For alterations to the "Gregorian Arms," Jamaica-road, Bermondsey, for Mr. Meacock. Messrs. Muggeridge & Powell, architects:—

Fisher	£322	10	0
Whitby	250	0	0
Riddell (accepted)	192	0	0

For new offices on forecourt of No. 200, Kennington-park-road, for Messrs. Briant & Son. Messrs. Muggeridge & Powell, architects:—

Riddell	£435	0	0
Fisher	397	0	0
Burman	319	0	0
Taylor	387	0	0

For enlargement of St. Andrew's Schools, Westbourne-park. Edward Vigers, architect:—

Temple & Foster	£398	0	0
Thomas & Butland	375	0	0
W. Oldrey	371	0	0
Lambie	359	18	0

For new chancel and organ chamber to St. Mary's Church, Balham, for the Rev. Thomas Bates and committee. Mr. Arthur Cawston, architect:—

Downs	£1,417	0	0
Higgs & Hill	1,320	0	0
Adamson	1,216	0	0
Bowyer Bros.	1,194	0	0

For alteration and additions to 53, High-street, Bromley, necessary for turning same into coffee-house and public baths, for Mr. S. Cawston. Mr. Arthur Cawston, architect:—

Crossley, Bromley (accepted)	£902	0	0

For new coffee-house and public baths, Shortlands, for Mr. S. Cawston. Mr. Arthur Cawston, architect:—

Ioge, Shortlands	£618	0	0
Bowyer Bros., Upper Norwood	595	0	0
Soans, Shortlands	576	18	0
Garrett, Clapham	575	0	0
Crossley, Bromley (accepted)	540	0	0
" " additional buildings to same, 223*l*, total	763	0	0

For additions to residence, 52, Circus-road, St. John's-wood, for Mr. H. S. Leon. Mr. Arthur Cawston, architect:—

C. Tavener & Son, St. John's-wood*	£1,365	0	0

* Accepted.

For additions to "The Temple," Oatlands-park, for W. Hewett. Also new stabling and entrance lodge. Mr. Arthur Cawston, architect:—

	House.			Stables, &c.		
Bowyer Bros., Norwood	£2,767	0	0	£1,182	0	0
Ingram, Hersham	2,690	0	0	1,090	0	0
Lynde, London	2,633	0	0	1,144	0	0
Knight, Chertsey	2,643	0	0	1,095	0	0
Brown, Oatlands	2,650	0	0	1,021	0	0
Batchelor, Leatherhead	2,630	0	0	999	0	0
Messom, Twickenham	2,393	0	0	993	0	0

For house on the beach, Weston-super-Mare, for Mr. E. T. Dew. Messrs. Hans Price & Wooler, architects:—

W. Crocker	£3,681	0	0
Jesse Shorney	3,200	0	0
Robert Shorney	3,175	14	0
A. J. Beavan	2,985	0	0
R. Lewis	2,889	10	0
S. T. Starvey & Co.	2,875	0	0
George Steere	2,175	0	0
J. Vowles (accepted)	1,994	0	0
G. H. Pocock	1,750	0	0

For pulling and rebuilding the "Somerset Arms" public-house, Fulham-road. Mr. W. E. Williams, architect:—

Marr (accepted)

For the erection of a mission-room at Knowbury, Shropshire. Mr. Edward Turner, architect:—

W. Howell, Tenbury	£980	0	0
James Hine, Ludlow (accepted)	875	0	0

For alterations and additions to 54, City-road, for the Finsbury Central Club, Limited. Mr. G. Treacher, architect. No quantities:—

Hogben & Co.	£496	0	0
Smith	490	0	0
Chapman	483	0	0
Porter	440	0	0
Marshall	444	0	0
J. O. Richardson	438	0	0
Harris	433	0	0

For the erection of a pair of semi-detached villa residences, Gunnersbury. Mr. J. Coverdale Bilton, architect:—

C. Rogers, Turnham-green	£1,110	0	0
E. Wildman, Chiswick	1,100	0	0
J. J. Osborne, Turnham-green	1,095	0	0
H. J. Whitman, Chiswick	1,034	0	0
W. G. Gibbons, Turnham-green	837	0	0
C. Bailey, Hammersmith	574	16	4
C. Wort, Shepherd's-bush*	512	0	0

* For drainage, bricklayer's, mason's, and slater's work only.

For additions and alterations to "The Warren," Lancing, Sussex, for Mr. E. Solas. Mr. Fred. W. Hyde, architect:—

R. C. Blaker, Worthing (accepted)	£550	0	0

For general repairs, painting, &c, to "The Warren."

W. Sendall, Brighton (accepted)	£110	0	0

TO CORRESPONDENTS.

J W G. (Yes)—E. W. S. (next week) T C (under consideration)—B T.—J. F—J. F—E. J D—W. H. R.—F. W. H.—R P.—Mr. J—H & Co—M & P—T. M. W.—B. C.—H. B & B.—F. R.—F. M.—G T U.—W. H—T. P.—G E. S—H. F.—A. S. J.—S. A.—S. T. H. & Co.—J P—A. C—W. O—J. & W.—E. T.—J. C. B.—G. F. S—P P P—T. A.—H. & Co.—B. & Co.—J. S.—"Fireman."—F. H.—F. B.—T L. A. G.

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The Builder.

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A New Book on Architectural Æsthetics.

IF we go so very wrong on the subject of architecture in the present day, it is, at all events, not for want of writing and talking about it. Here is a book of nearly 500 pages* devoted to the consideration mainly of the right theory of architecture, what it means and how it is to be pursued. It is, perhaps, doubtful, whether the writing of any number of treatises on this subject will materially influence the practice of architecture. If theories of the art are propounded in literary form, however, it is to be desired that they should be recommended if true, and criticised if false. Now, a good deal that Mr. Eidlitz propounds is true, and some of it is put in an original and thoughtful manner, which merits consideration.

It is not necessary to go into that part of the author's work in which, for the fiftieth time, the view which regards architecture as a mere assortment of ancient styles is denounced. It has been denounced in these columns over and over again, as well as by well-known individual writers in separate treatises. There are a large number of practising architects at the present moment who would fully join in the denunciation; perhaps the majority of those who are of good status in the profession. But such is the force of circumstances and of habit, and of the necessity of making a living, that the very men who denounce the literal reproduction of past styles in theory adopt it in practice; and in many cases their employers would have nothing to do with them if they did not. In some of his remarks the author is hardly fair to the prevalent principles of architects. "Buttresses where there is no lateral pressure, arches of lath and plaster where there is no abutment, columns which support nothing," are not really very common occurrences now with architects of any professional standing. But, for all that, there is a point in the question,—"How many are there who are willing to forego a tower where it is not needed either physically or æsthetically?" Not many, it is to be feared; and for this kind of tendency the competition system is in great measure responsible. This system is sharply condemned in another part of the book, on other grounds, to which this one might have been added.

The central idea of Mr. Eidlitz's preaching, however, so far as architecture is concerned, is the necessity of working from within outwards, if we may so say, in maturing an architectural design, and the paramount importance of constructive knowledge and constructive stability and fitness. "The modern architect," he observes, "but rarely refers an architectural composition to the idea which has given rise to it." and this is a very comprehensive statement of the radical deficiency which is at the root of most of the failures of modern architecture, and which, though not intentionally on the part of any one, is fostered by the system (if system it can be called) of architectural education in England. A pupil learns the style of his office, and the style of his office is the style in fashion at the time. His ambition, if he is a hard-working youth, and desirous to excel, is to make as many sketches as possible of old buildings in the approved style; and his first object when he has a building to carry out himself is to turn these picturesque sketches to account, by introducing them in his elevations and perspective view. Thus, in designing a house, the idea predominant in his mind is not that of a dwelling with so many rooms in convenient relations to each other, and adequately lighted, warmed, drained, and ventilated. The first idea is that of an exterior exhibiting the details and incidents peculiar to the favourite style, within which it is hoped the required rooms and sanitary provisions may be arranged. There may be a feint of doing the plan first, but the real object is the picturesque (or supposed picturesque) exterior.

In reference to this part of the subject, Mr. Eidlitz does good service in pointing out the misleading influence of what is usually called "taste" on the minds of the architects and those who profess special interest in architectural art. What he says is too true; the architect's *taste*, that is, his acquired prejudice in favour of a certain style of the past, "takes the place of reasoning, of study, of knowledge, of judgment, of facts, of ideas, of everything which is a motive of action with other men; and it is his taste which has done more injury to architecture than any or all other causes combined. . . . The architect wilfully abandons the experience of centuries" [*i.e.*, we presume, practical experience] "not because he denies its value, but because he dislikes the use made of this experience by others." A practical sanitarian builds a well-constructed but ugly house; the architect of "taste," instead of aiming at improving the occasion by building a well-constructed and artistic house, says, in effect, "This is ugly,—buildings in such a century were beautiful; let me build one like them," without reflecting that the said buildings were what the men of their time really required, and that it by no means follows that the men of this day require the same stamp of building: he observes that sanitary authorities build ugly houses; he resolves, therefore, to have nothing to do with sanitary matters, since he is emphatically an artistic architect. That is about the position of the matter, and very absurd it looks when put down in a definite form on paper, although many architects act practically on that theory throughout their professional lives, and are encouraged in doing so by their friends. There would be less serious objection to this position, perhaps, if we could be sure that the "taste" which is thus made the predominating influence were the right one or the best one; but there is obviously nothing to determine that, for what is right to one generation is wrong to another. Of the will-o'-the-wisp nature of taste, Mr. Eidlitz adduces as an example the prejudice in favour of Venetian architecture which Mr. Ruskin has been led into. He says, "The architecture of Venice heightened in its picturesque effects by an Italian sky and the ever-present Adriatic, and hallowed by historical reminiscences of the wonderful power and success of a handful of patricians and merchants during several centuries, has left upon the sensitive mind of Mr. Ruskin an indelible impression which dulls his perception to the beauties of architectural art outside Venice, and blinds him to many glaring defects of Venetian architecture itself. Why is he not equitable and just in his judgment, through the mere force of his natural taste?"

Why, indeed? For probably the eminent writer referred to has a more cultivated and refined "taste" than any but a very small number of his contemporaries. Again, says the author, "think of the period of Louis XIV., the Rococo of the European Continent, the palaces of the great built in forms so vile and unmeaning that we regret the tardiness of time and the elements in not wiping them off the face of the earth. . . . . Are we warranted in assuming that the architects of the Rococo were endowed with *taste*? And yet all Europe thought so in their time." The test in regard to architecture is not merely that vague sense called "taste," but it is taste subordinated to logic, to a consideration of the relation between what was wanted and what has been accomplished,—between what ought to have been expressed and what is actually expressed.

In other words, every building should be designed to express the idea of that purpose for which it was erected, and this idea is to influence, not to be influenced by, its style and decoration. The building being in the first instance (in all but very exceptional cases) a structure to fulfil practical necessities, the method of its arrangement and construction is the most important element of all, and that which should most decisively influence its expression. This is what Mr. Eidlitz adopts as the leading principle in architectural design very decisively; and though we need not tell readers of the *Builder* that the view is not a

* The Nature and Function of Art, more especially of Architecture. By Leopold Eidlitz, Architect. London: Sampson Low & Co., 1881.

new one, some of the arguments and illustrations which he adduces in support of it, as we shall mention just now, are somewhat new and very forcibly put. We may say, however, first, that he certainly under-rates the importance of the part played by architectural decoration in contributing to true architectural expression. In Chapter IV. he attacks rather decisively a dictum of Ruskin's, that architecture begins where that which is merely necessary leaves off. Ruskin does not, certainly, in the quotations which the author refers to, put the matter in a very logical or convincing manner. It is unquestionable that what is necessary to the plan and construction is the foundation of architecture; but for all that, it remains true that architectural art resides not merely in these necessities, but in giving due and suitable expression to them. One quotation which Mr. Eidlitz criticises is this of Ruskin's,—"I suppose no one would call the laws architectural which determine the height of a breastwork or the position of a bastion, but if to the stone facing of that bastion be added an unnecessary feature, such as a cable moulding, that is architecture." This is certainly not fortunately put, and we half suspect that if we had the context (the author gives no reference for his quotation) we should find the meaning of the sentence would have some modification. At all events, we know very well that the addition of that or any other form of ornament would not raise the bastion to the rank of "architecture," unless the said ornament in some way assisted the expression of the erection by emphasising some principal point in its construction. The idea of making structural works into "architecture" by adding some ornamental features to them is the very heresy of which the engineers are constantly guilty, and which we have complained of over and over again. But Mr. Eidlitz, in commenting on this, goes too far. He says:—

> "The reflections called up in our minds on reading all this may be stated as follows:—If Salisbury Cathedral, for example, were stripped of every statue, ornament, and moulding which now adorns it, of everything 'unnecessary' to the stability of the cathedral as a structure, would not the naked structure which remained still tell the story of a Christian idea and of the emotions of men imbued with that idea; and would it not thus continue to contribute to the mental health, power, and pleasure of the beholder, and remain a work of architectural art?"

It might still remain a work of architectural art as regarded planning and construction, but it would be a very unmeaning pile. The building would lose not only all its beauty, but most of its expressive meaning. The application of ornament should always have reference to the structure: but, if so applied, it is only carrying the author's own principle one step further. The general distribution of the plan and section expresses the practical objects of the building; the ornament carries the expression further, by its own beauty of detail, and also by its distribution so as to emphasise the leading points of the construction. In this respect it is quite true that a very little ornament well designed and well placed is of much greater value than a profusion of ornament placed without regard to structural expression. But with no ornament at all (it must be remembered that the writer is including mouldings, cornices, and base courses under the general term "ornament") very little expression could be obtained: and architecture *is* expression. Building without expression is simply *building*, not *architecture*. What is required is that the actual necessary facts of the building construction should be realised first, and that the ornamental features should be the higher and clearer expression of these, and in that case they are an intrinsic and important element of architecture. They are not so only when they are thought of and designed first for their own sake only, and the structure merely regarded as a means of exhibiting them.

Mr. Eidlitz is more successful in his next chapter, on "Illogical Reasoning," in pointing out that forms, such as the forms of leaves in nature, are not necessarily beautiful in themselves and in every situation, but are beautiful relatively to their situation, and as the expression of certain conditions of growth. On this account, Ruskin's theory that pointed arches are beautiful because they remind us of the pointed forms of leaves (which the author quotes to show its weakness), is manifestly absurd; indeed, we really did not remember that Mr. Ruskin had ever been guilty of such an absurdity in architectural criticism. Mr. Eidlitz, however, makes a blunder himself in the same sentence, in denying that a pointed arch is especially strong, and that a lintel is a weak form of construction. He must surely be aware that the pointed arch is stronger at the crown, and exercises less lateral pressure, than the round arch, and that the circumstances of its introduction clearly show that this was a main consideration in leading to its first adoption. He must be aware that the lintel is a wasteful form of construction (in stone, at least), using the material in the way which gains the least amount of strength in proportion to its mass.

Architects, on the other hand, will be obliged to the author for the decided tone in which he speaks of the pretensions of lay critics and patrons. Art, he says, can be successful only when pursued for its own sake; architectural art submits to popular interference in the very process of creation. The modern architect "puts his thoughts upon paper, and before he executes them submits them to laymen for approval. There is no art or trade,—there never was one in this world outside of modern architecture,—which is found to be willing to court popular criticism and to abide by its decision before its works are executed. The architect submits to laymen a design of what he intends to do, and thereby admits, what is utterly false, that laymen are competent to compare a series of such designs and select the best, or that they can form a correct judgment of any one of them." A good commentary on the competition system, in which the employment of professional judges is still exceptional. When the subject is a dwelling-house, however, the owner has certainly a claim to see what his architect is going to provide him with in the way of accommodation, and it is hard to say that he is not to have any voice in the appearance of his house, if he really have an opinion on the matter. Most people for whom drawings are made, however, have really nothing worth calling an opinion; they have generally seen something else that they like, perhaps under quite different conditions, and want to have it imitated. They would in most cases be much wiser, if they have got the services of a good architect, in trusting to his judgment, and the architect would often be much wiser if he showed more decision and gave a more decided opinion as to what was best. Architects are often far too complaisant to the owner, who, in reality, requires to be guided, and would, perhaps, in his inmost heart be thankful to the architect who would make up his mind for him, but he is not likely to adopt that line when he sees no evidence that the architect himself has any decided opinion.

The second half of Mr. Eidlitz's book treats of the "nature of architecture," considered under various heads,—"Ideas," "Form and Construction," "Proportion," "Style," "Analysis," &c. The best suggestions in regard to the expression of an "idea" in architecture are contained not in the chapter headed "Ideas," which appears to us not to lead to anything very practical or even tangible, but in that on the "Definition of Architecture," in which are some critical suggestions well worth considering. "A community is supplied with dwellings, school-houses, churches, theatres, libraries, assembly-rooms, and courts. They all afford shelter to the same individuals in various combinations, but under different conditions. It is to the nature of these conditions that we must look for the idea expressed in the structure." The author goes on to say that if these groups are the result of mere physical convenience, then the structure fitted to accommodate these groups is merely a work of mechanical art. We are not sure about that conclusion being inevitable; but, at all events, this way of putting it recognises fully what is so much ignored in modern architecture, the importance of the plan as the basis of architectural expression. What is said on this head is so well put and so suggestive that we will quote it at some length, as an example of the author's style of writing and reasoning:—

> "But if these groups are organised to express an appreciation of an idea illustrated by acts performed within the walls of a structure, either by word, motion, or sound (music); and if by their grouping they indicate an emotion, which is the result of the acts participated in, or merely perceived by the senses; and if the structure is so arranged as to express, or at least to betray in its form, in the modelling of its masses and parts, in its decoration and colouring, an adaptation and expression of the presence, order, magnitude, number, and relation of the groups accommodated in its interior,—then this structure is a work of fine art expressive of an act illustrating an idea. * * * * * *
>
> A meeting-house containing nothing but closely-packed sittings, wherein men and women are stowed with economy of space to listen to a discourse from a pulpit crowded against a wall, is not a work of fine art; for the position of the audience does not indicate an emotion, say the worship of God, which is the result of an act in illustration of an idea, say our dependence on God and His universe, of which we are but an insignificant part. Structures of this class, indeed, perform the act of sheltering men from the inclemency of the weather, but not an act which is the result of an idea. On the contrary, such a structure is merely the result of a physical necessity, for the meeting-house, like the barroom, is constructed for the mere purpose of human stowage, without reference to any possible act of the audience beyond mere existence, and is strictly prohibitory in form and expression of any demonstration which is the result of an emotion. When the men who listen to the discourse make any motion, it must be to leave the place. The limits of the structure forbid any method of grouping other than that of a series of equal human quantities, which have but one desire, viz., to be accommodated without being crowded, and to be protected from the sun and rain.
>
> But when, on the other hand, we see a structure providing for a combination of groupings various in magnitude, elegance, dignity, and richness, which combination, in part or as a whole, represents certain acts of these groups,—say prayer, praise, confession of sins, exhortation, the partaking of the Communion, baptisms, marriages, funerals, ordinations, processions of various kinds, and consultations, such as we find embodied in the nave, aisle, choir, cloister, chapel, vestry-room, chapter-house, and baptistery, of a cathedral,—we may then say that such a structure denotes acts which are the result of ideas, and that it assists the congregation within it in the performance of acts explained by their resultant emotions."

This is really a very good way of stating the distinction, felt by all persons of artistic culture, between merely utilitarian buildings and those which are essentially architectural in their structure and design; and it serves also to indicate the true basis of the relation of plan and structure to what is generally called architectural design, making these qualities part of the design, and not, as the school of Ruskin and his followers teaches, a mere material basis to be overlaid with "design." This point the author elucidates further in some sensible and logical remarks which we have not space to quote. It is on this ground, we presume (though it is not directly so stated), that in another portion of the work (the chapter on "Analysis"), the author makes a plea for the æsthetic suitability of the Mediæval three-aisled church, which many practical men have condemned for modern places of worship. The writer says that "a congregation of men and women spread equally like a plaster over indefinite space is not a picture worth seeing; in fact, it is not a picture at all; it has neither foreground, middle ground, nor background." This is true enough, but it does not follow that the artistic grouping which is desired might not be attained by other means than by interposing columns or piers between part of the spectators and that which they wish to see and hear. We doubt, again, the criticism that follows in regard to railway station construction and the large-span roofs now used, which are objected to as merely a kind of *bravura* construction, unnecessary and opposed to true architectural economy as well as to picturesque architectural effect. "Posts, columns, and piers cannot possibly, in such a structure, intercept anything worth seeing. There is everywhere an abundance of space for these between the tracks." We must deny that a large railway station built on ranks of iron columns would be as convenient or fitting as one with a single-span roof. There are, for instance, officials to whom it is important to see what is going on in every part of the station,—the station-master, for example; and in some stations the carriages are hauled about for shunting by horses which walk in the "six-foot," and very likely those conversant with railway-station work could bring forward other objections. Nor do we see why the fact, that the temptation to make these large roofs "may be found in the love of displaying a mechanical effort," should be necessarily any objection. The love of displaying mechanical effort had a good deal to do with some of the *tours de force* of vaulting in the Middle Ages, which we now admire.

The chapters on "Proportion," "Style," "Ornament," and "Criticism" contain matter which merits more consideration than can be bestowed in the closing paragraph of an article, and we will devote some more words to them in another number; for, in spite of our doubts above expressed as to the ultimate usefulness of theorising, a writer who puts forth a serious and thoughtful effort to improve the theoretic basis of architectural art has a claim to careful consideration at our hands, whether in the recommendation of what seems true, or the criticism of what we think to be wrong.

East Looe Church Competition.—It is reported that the Committee have awarded a London architect, whose motto is "Britain," the first place, and a Cornish one "Thoroughly Good," the second premium of 10*l*.

PRACTICAL SCIENCE IN ENGLAND AND ABROAD.

The industrial energy of the United States affords an example which may be advantageously followed in Europe. It is a matter of some wonder to those of us who can remember the railway system in its cradle, and who are personally aware of the immense start which, five-and-twenty years ago, the forges, the factories, and the railways of England had and held over those of Continental Europe, to see how the spirit of enterprise has spread its wings from our shores. It is to Berlin that one great electrician goes to carry first into practical effect his electric railway. It is from the Alps that the first practical experience, so precious to a mining people like ourselves, in mechanical rock-cutting, and in the application of compressed air to the purposes of mining, is to be derived. And now, in that last new development of the doctrine of the convertibility of the physical forces,—lighting by dynamic energy,—we find ourselves at a distance behind the United States such as must be measured rather in fractions of a century than in portions of a year.

A glance at the map of the United States, with its straight lines of demarcation, so different from those afforded by either the political or the physical geography of the older world, may serve to impress the imagination with a sense of the rapidity with which scientific invention is carried into practical use in America. From Albany to Great Salt Lake is a distance of 38° of longitude. From New York to New Orleans is a distance of 12° of latitude; Akron, (in Ohio), Wabash (in Indiana), Denver (in Colorado), lie wider apart than do Paris, Brussels, and Berlin. From each of these distant points, in one single, and, so to speak, casual, letter from an American interested in the progress of electricity, comes the same story. We regard with a mixture of pride and wonder the few experimental steps which, chiefly at the risk of French, and partly of English speculators, have been taken towards lighting parts of London and some other towns by electricity. Neither in England nor on the Continent have there yet been established general lighting stations, to supply electric light after the fashion of gas-works. In the United States, we are told, "no considerable city is without such an institution." At Salt Lake City an arc-light company has for some months supplied electric light to miscellaneous customers. In Denver, Colorado, a city of 35,000 inhabitants, above 200 arc-lights are supplied to shops, hotels, &c., by a company; the light in each case being furnished at from 20 per cent. to 30 per cent. below the price of gas, as well as being much greater in quantity. The Salt Lake company is said to have been the first in the world to supply electric light in direct competition with gas. The returns to the proprietors are lucrative in each case.

The subject is attacked in America precisely as, thirty or forty years ago, the manufacture of gas was introduced into our smaller towns. A local company is formed, which, of course, has the advantage of the experience attained up to the latest hour. A concession from the patentees of the system chosen is arranged for. Ground is bought, buildings are erected, and engines, boilers, dynamo-machines, and the whole light-producing apparatus are purchased and erected. Powerful engines are employed, with fly-wheels weighing from 8 to 10 tons, in order to have steadiness and uniformity of motion, the absence of which is evinced by that flitting, firefly-like pulsation of light with which we have become familiar on the banks of the Thames. We have not heard of the application of water-power to the service, but of its adaptability near some of the great rivers of America there can be no doubt. Wires are conducted either under or over the streets, to be tapped where required, in the same manner as gas-mains. Automatic contrivances, for the purpose of turning light on and off at pleasure, are supplied with the lamps, which are visited and kept in order by the servants of the company. The result appears to be the advance of electric lighting all along the line.

The use of masts or towers of the height of 200 ft. for the lighting of squares and streets is becoming general. The city of Denver is lighted from lofty towers, and for the price formerly paid for gas four times the area is now lighted by electricity. In the city of Albany 300 electric lights, placed on alternate blocks, have replaced some 2,000 gas and oil lamps. Akron, in Ohio, is lighted from towers; and Wabash, Ohio, by four lights on the steeple of the Court House. In New York there are competing companies, one of which is now supplying 1,000 lights to shops, and is providing for 4,000 more. Most original of all is the application of this source of illumination at New Orleans. In the fever-haunted delta of the Mississippi the comparative coolness of the night is now selected for running the races of the Jockey Club by the light of electricity.

The tariff of the American light companies charges a fixed annual sum for electro-motive power, according to the number of hours for which it is supplied. The companies provide and maintain the lamps; the consumers supply their own carbons. The average price is about 30*l.* per annum for a 2,000-candle light, which is equal to 125 gas-lights of 16 candles each. A shop requiring twenty gas-burners would be better lighted by an arc-light of the strength of 100 gas-jets. In giving this,—the electric light companies' statement,—it must, however, be remembered that for many purposes number and nearness of lights will be more important than actual quantity of light radiated from a single point. As to this, however, we can only oppose scientific scepticism to actual practice. The Americans seem to have found out, in spite of the inconvenience of single points of illumination, that they are on the right track.

We are not writing with the view of recommending our readers hastily to subscribe for any new project of electric light companies, such as we may fairly anticipate will make its appearance in sequel to the above account. But still less do we recommend negligence of the subject. In case of the matter attracting that attention which it seems to us to deserve, we recommend those who take an interest in it not to be satisfied with mere second-hand reports, however brilliant and exact. In point of fact, experience would say, "The more brilliant they are, the less are they to be accepted without proof." What seems to us desirable is the appointment of some steady, cautious, intelligent engineer to visit the American gas-lighted cities as an English commissioner; to see for himself the mode of lighting; to measure the intensity of the light as it comes to the eye; to ascertain the prices, not of the electric light only, but of gas, coal, and other matters with which it has to co-operate and to compete. An impartial and exhaustive report on the electric lighting of the cities of the United States would be a professional paper of such importance that we hope it will not first emerge from the hands of a volunteer or the agent of a speculation.

CONTINENTAL GATHERINGS.

In Germany, at the present moment, a taste for the national art, more particularly the architecture, which at the period of the Renaissance possessed such a character in the land of Dürer and Holbein and their prolific contemporaries, strongly prevails. It is not, it will be seen, that phase of the Renaissance which with us is now in vogue, and which has safely crossed the Atlantic, where, we learn, a new theatre has been recently erected in the Empire City in the "colonial Queen Anne style." In Germany the style chosen is that of the Early, or rather Middle, Renaissance. To Nuremberg, the home of Dürer, we learn from the *Zeitschrift für bildende Künst*, can be traced the origin of this revival. In 1874 Herr Bergau, an architect, having built in that most quaint of the old cities of Germany a house for one of his clients in the style of the Landhaüser of the Nuremberg patricians of the sixteenth century, with all the surroundings in keeping, the garden, the interior decoration consorting with the old furniture, while the modern comforts were in no way neglected, the effort met with immediate encouragement. Herr Bergau found himself amply occupied with commissions from the wealthy merchants of the city; among these one had a ruined castle in the neighbourhood completely restored and furnished in the old style; others contented themselves with the more modest satisfaction of seeing their rooms at home and offices restored in regular "Alt Nürnberger Stil."

In a rather tardily-published review of the architectural drawings at this year's *Salon*, our contemporary, *L'Art*, in speaking of the presence of a number of the competitive plans and sketches for the monument to the French Constituent Assembly,—mentioned by us in these columns some months since,—seizes the occasion to praise warmly the system of architectural competitions. It is a matter of congratulation, remarks our contemporary, that in spite of the protestations of certain established artists, the custom of public competitions, so beneficial to the cause of art, tends daily to become more developed. It is no longer a matter of doubt that all those who take part in such struggles issue from them more skilful and more experienced than they went in. Such contests are a powerful means of artistic education, and in the present day a stimulant of the most fruitful nature. At certain epochs which have possessed a style of their own, which had the good fortune to count among their artists undisputed masters of their art, we can understand that the direct commission produced excellent results; but at present, whatever be the amount existing of individual talent, such is not the situation. Our age is groping its way, and it will alone find it by adopting logically a system which is approved by public opinion, and which in reality is the result of general insufficiency, and of a crowded artistic career. The struggle is open to all, except those who consider it beneath them, and it is difficult to believe that any artist, with the programme of a competition before him, can resist the expression of his artistic conception. Of what is he afraid? The partiality of the jury? But public opinion, that of his brother artists, will invariably prevail, and it can be said that apart from certain exceptional cases, the meritorious works are never overlooked, and when by chance an artist is a victim to injustice, he may feel assured that he loses nothing in the opinion of his professional brethren. Why should we think much of some amount of personal annoyance if the cause of art gains, and if by means of this contact with public opinion it tends to be brought home to all? The enjoyment and appreciation of art must not remain indefinitely confined to the critics, the art-lovers, and purchasers. Our contemporary congratulates, on this ground, the French Minister of Fine Arts for having opened to competition the proposed colossal monument to be erected at Versailles; for, in the competition, while several of the more eminent architects have declined to take part, not a few young and almost unknown men have been brought forward, and against the merit of those rewarded not the slightest demur has been made; if originality seem wanting it may to a great extent be attributed to the binding nature of the programme. Respecting the actual results, our contemporary has only one regret to express,—a regret, on comparing the competition of to-day with that held fifty years ago for the familiar column of July, that in this half-century so small an artistic progress in originality has been made. Here is the position to which we have been led in France by the system of instruction which is called "classic," remarks our writer,—the preconceived idea which carefully sets aside from the education of the young student all that is not Greek or Roman. Let antiquity, by all means, be fully studied, nothing better, but that we should persist in believing that it is sufficient to cull with more or less skill from those great sources details and motives to suit modern programmes, and in this manner to succeed in expressing the conceptions of a new art, is to condemn our age to sterility, or at least to mournful commonplace. If the education were broader, if our academic instruction adopted some of the ideas put forward within a few years past, and the lessons which the critical study of many generations now places at the disposition of the artist, we should not be long in seeing the present state of things modified, for talent and imagination are not wanting; but the ground must be prepared: we must not oblige our artists from the very commencement of their studies to confine themselves to a restricted circle of ideas, which limits their power of thought without satisfying their reason and aspirations. Our extract has been lengthy, but it is interesting to see expressed in full from a foreign source the feeling in the matter of competition that in this country has so many adherents. It is well, too, that young students at home should learn from the experience of their brethren abroad, and understand the true value of, and the lessons to be obtained from, defeat in the "struggles," as our contemporary has put it, of their youthful career.

The cost of the colossal Brussels Palais de Justice, which is now being erected, is a striking instance of an exceeded original estimate. The work, as many of our readers may know, is far from being terminated, and hard upon two

millions sterling have been already expended. The original figure of the estimate was some twelve millions of francs, about half a million sterling. When the huge work was commenced, when the late lamented burgomaster Anspach was in power, the city of Brussels agreed to pay a sixth of this half million, but now the expenses have increased so enormously that the municipality have lately endeavoured to avoid the payment of the seven millions and a half of francs, which is the claim against them. The Brussels municipality have, however, been brought to law by the Government, and it has been decided that they will have to pay a sixth of the total cost of their new law-courts, whatever that sum may be. The wealthy and industrious little Brabant capital will, however, find it no great difficulty to pay the bill in spite of the numerous other and bigger items which it has had within a few years past to settle for its building activity. The changes in the old town are appreciable to those even who may visit for the first time the characteristic Belgian capital, whose charm, a rare feature, has only been added to by the spirit of modern improvement. In few cities in Europe, it may fairly be said, can the old and the new be seen side by side in more friendly and enhancing company than in Brussels. It is interesting and especially instructive, in speaking of modern improvements in Brussels, to notice the recent statement made by a correspondent of the *Pall Mall Gazette* to the effect that since the once befouled and reeking little river Senne has been closed,—over it now runs the grand Boulevard Centrale,—the average length of life in Brussels has been increased by two years, a fact striking enough, we consider, in its suggestiveness.

We have before now spoken of the building activity in Vienna. The Austrian capital at this moment is following wildly the example of Paris; in every direction building is going on, and, as is so invariably the case in great capitals, more particularly at the west end. Those who may remember the feverish period of Hausmannisation of 1872 and 1873, which was followed by, if it did not in a great measure hasten, the terrible financial crisis, the *crac* of the latter year, will, on revisiting the banks of the blue Danube, see those days revived, but without any of the unwholesome excitement that accompanied that movement. On the Franzen's Ring is being built a whole series of gigantic palaces, of which the two first opposite the Volk's Garten, two vast twin palaces of monumental architectural features, are intended to be occupied by the National Museum of Painting and Sculpture; here also will be placed and shown regally the magnificent collections of the Belvedere, the Ambras collection, and various other works of art belonging to the State, scattered throughout the city; a little farther on, on the Parade Platz, another monumental building is being erected for the University, at present in very narrow quarters in the old town; opposite rises a new theatre in the Teinfalt Strasse; and in various directions, but in the same neighbourhood, are rising colossal houses in the style of those which border the "Ring." Near the Belvedere are being built a number of private residences, and the municipality are daily expected to give their authorisation to the plan proposed of transforming the familiar Prater into a Bois de Boulogne.

THE EVER-RECURRING QUESTION OF THE URBAN ACCOMMODATION OF THE WORKING MAN.

A RECENT report of the Dwellings Committee of the Charity Organisation Society calls attention to a subject which has been often seriously discussed in our columns. It is, indeed, one on the due settlement of which the future of urban architecture must in no small measure depend. It is the ever-recurring question of the housing of the very poor.

The question has attained its present magnitude and urgency chiefly from our national reverence for the great rule-of-thumb principle. We are not about to speak with disrespect of what has been a characteristic of the English people at all events since the year 1066, and it has become a classic axiom with us that institutions, including the institution of building cities, in order to prosper in our islands, must grow indigenously from the soil. *Civitas nata, non fit.* At the same time it cannot be denied that there are inconveniences attendant on the plan of never attempting to foresee, and thus to prevent, any inconvenience arising under the unchecked influence of the principle of growth. As London and other great centres have increased in age they have increased in population. The older parts have at the same time increased in value of site, while the buildings have grown more and more dilapidated and unfit for the requirements of modern life. This has led to two changes. Along the main lines of traffic, to which the old ideas of trade still cling, and where the actual exposure of goods to the passer-by is yet considered to promote their sale, new dwellings have arisen, calculated, or, at least, intended, to serve the needs of the retail tradesman. We need not here refer to the fall in the value of such sites which is now being effected by the concentration of custom in certain stores. In the back streets and side ways, at the same time, where there was less temptation to the proprietors to go to the expense of rebuilding, as the houses became older, more decayed, and more shut out from light and air, the class of tenants has descended in the scale of wealth and ascended in numeric amount. More and more tenants, at lower and lower rents, have divided houses, floors, and even rooms between them, and thus have grown up the nests of dense population which have obtained the melancholy but significant name of Rookeries. And thus as the whole population has increased, and as the distance between the richest and the poorest has increased at a still more rapid rate, the question of decent accommodation, near his probable work, for the decent artificer, has become more and more perplexed. The whole process has been artificially complicated and disturbed by the needs of internal communication, which have ploughed the deep furrows of railways and of new streets through our cities, thereby necessarily displacing an undue proportion of the smaller householders and their tenants.

It is evident that if this state of things could have been foreseen a plan might have been adopted by builders of cities which should have carried out, on an adequate scale, the natural growth of the infancy of towns. The main features of that infancy depended on the gradual clustering of minor dwellings round the castle of the lord. For hamlets to grow to well-proportioned cities, it would be requisite either to reserve proportionate areas for the humbler and cheaper dwellings, or to rear large and many-chambered dwellings, such as the Spanish and Portuguese monasteries, or the Italian *Alberghi dei Poveri*. To this, however, the independent ownership of the area of our cities has presented an insuperable obstacle. Each landowner has striven to do what seemed best for himself. Each has forgotten that by bringing his private plot of ground into a common stock, and by receiving his corresponding share of the income of the best arranged possible plan for well-ordered buildings, he would ultimately derive more from his ownership than would be possible in any other way.

Here, then, from time to time, we apply patches; but each patch helps us but little, and that for the two reasons that it is so small and so costly. We are reminded that a population nearly equal to that of Ireland is crowded into the 122 square miles of London, increasing in its density from circumference to centre. The population of a town of large size, some 60,000 inhabitants, is annually injected into this limited space. It is now twenty years since the munificent bequest of Mr. Peabody founded a new system of lodging-houses. But what was adequate for the London of 1860 is quite inadequate for the London of 1880, and it is not so very far an outlook to the London of 2,000 A.D. The Peabody buildings, we are told, comprise 2,355 dwellings, or 5,170 rooms, and are occupied by nearly 10,000 persons, at weekly rents averaging 4s. But this rent is four times that which the very poor can afford to pay; and the possibility of sitting at this rent has only been secured by two contributory causes, neither of which is of a purely business kind. One is the provision of the building fund at a low rate of interest; the other is the sacrifice in the value of the sites, which is said to amount to about half a million sterling. This costs the ratepayers 280*l.*, or 7·5*d.* per annum, for each family so housed. This is hard upon 3s. a week. Thus, given the elements of the value of urban land and cost of building on the one hand, and of limitation of the rent that the working man can afford to pay on the other, the provision of decent and reasonably rented abodes for the poor in the centres of population is one that is quite insoluble on merely commercial principles and data.

Here comes in the question of relief by railway accommodation; and no doubt this is a very important element in the case. But it is far from a simple one. The sites on which we have just seen that it cannot pay to build are left vacant, which pays still less. Then comes the question of the proper setting out of the districts to be inhabited by the workmen along the lines of railway. This is a matter which, if we leave to regulate itself, may in another generation repeat the evils from which we are now suffering in an exaggerated form. Then comes the question of the limiting distance, fixed by the cost of railway travelling. The wisdom of Parliament has provided for the carriage of the working man at a penny a mile. If the companies stand on their rights, that means a shilling a day,—six shillings a week, to be added to the rent of rooms, six miles beyond a metropolitan terminus. It is true that all the companies carry for less than this tariff. But it is also true that they, one and all, have refused to allow any impartial and exact investigation of the question, what does it cost,—in actual expenditure per ton per mile,—to convey third-class passengers, in given numbers by appointed trains. And it must be allowed that the Government regulations as to stopping at every station which were intended to benefit the third-class passenger have directly the opposite effect. As far as working expenses (exclusive of interest on money) go, it would cost less to convey 500 third-class passengers from St. Albans to Moorgate-street without stopping by the way, than it does to convey the same number from Praed-street to Moorgate-street, stopping at each intermediate station. As to this, we can, if required, give detailed proof.

We therefore cannot too strongly urge upon all those persons who, like the Charity Organisation Society, feel the necessity of looking a few years ahead as to the urban accommodation of the working classes, to do their best to secure the thorough investigation, scientific and practical, of the questions to which we have called attention. Where to build, how to build, how to give access to, and at what price to serve, the working-man's quarters of the metropolis, will hereafter become very embarrassing questions, if their solution be left until we are still more in the thick of them.

THE LAST AND MOST IMPORTANT LINK BETWEEN THE EAST AND THE WEST.

TELEGRAPHIC advice from Berlin announces the concession, to the well-known Baron Strousberg, of "a railway along the valley of the Euphrates." No public work out of England has hitherto been suggested which is of more importance to the commerce, the prestige, and the military security of the British Empire than such a line. In the *Edinburgh Review* of January, 1879, was an article on "The Road to India," which rather resembled an official summary of the main facts of the case than an ordinary review article. The writer commenced by showing that as far back as 1834 the Government of the Duke of Wellington had regarded the subject of a communication with India along the old line of Eastern traffic to be of sufficient importance to send out an expedition for the survey of the river Euphrates, down which it was proposed to steam, and "for the elucidation of the question of the best mode of communication between the Mediterranean and the shores of India." The information collected by this expedition, which was under the command of Captain Chesney, with the local rank of Colonel, was so voluminous that it has only partially been published. Comparatively few persons are aware of the existence among the archives of the Admiralty of large scale surveys of the course of the two great rivers, the Euphrates and the Tigris; of a sketch map of the entire district; and of a section, 140 miles long, from near the mouth of the river Orontes, by Antioch and Aleppo, to the banks of the Euphrates near Beles, some 1,000 miles from its mouth. The river, the lower part of which is very tortuous, is, of course, much longer than a railway on its bank might be. The total length of railway, from the ancient war-port of Seleucia, near the mouth of the Orontes, to Grane, or Sonedia, on the Persian Gulf, is stated at 934 miles.

In 1861 the Euphrates Valley route was declared by the *Times* to be "the most important question of the day." "When it is considered," said that journal, "that the proposed Euphrates

Railway will not only supply all the facilities demanded for commerce, but is to shorten the journey to India by almost one-half, the changes impending in this region will appear to claim greater attention, commercially and practically, than any at present to be looked for in other quarters of the globe." In July, 1872, a Select Committee of the House of Commons, with Sir Stafford Northcote in the chair, reported, after hearing the evidence of twenty-eight witnesses, in favour of the construction of a railway "from some suitable port in the Mediterranean to some other suitable port at or near the head of the Persian Gulf."

The time occupied in the voyage to India is thus stated. By the Cape, the old route, it would take from ninety to 120 days to steam from Portsmouth to Bombay. By the Suez Canal the voyage may be accomplished in from twenty-six to twenty-nine days; but the stoppage of the Suez Canal may any day be effected by a very small quantity of gunpowder or of dynamite, the explosion of which would choke this narrow waterway by foundering a vessel in its channel. The time necessary for getting from London to Bombay by making use of the existing line of railway from Calais to Brindisi, and of the Euphrates line from Selencia to Grane, would be, according to figures given by that very competent authority, Sir Henry Tyler, R.E., 349 hours, or fourteen days and a half. If Kurrachee be taken as the Indian port, instead of Bombay, the time can be reduced to 307 hours, or twelve days nineteen hours. By making use of the existing route to Brindisi, and steaming from that Italian port through the Suez Canal, Bombay may be reached in 451 hours (a period which will be extended to at least 500 hours during the monsoon), and Kurrachee in 435 hours. There is thus a gain of from four days nine hours to six days ten hours to Bombay, and five days eleven hours to Kurrachee, practicable over the greatest speed with which the transit can be at present performed.

It may well be asked, "What is it worth the while of Great Britain to expend, in order to reduce the length of the journey to India by five days, or 35 per cent of the interval, measured in time, that now separates them?"

But saving in time is not all that has to be considered. Not only is a line drawn from some point on the Syrian shore to the Upper Euphrates, and thence running parallel to that river to the Persian Gulf, where the sea route recommences, shorter, by 18 per cent., than the Red Sea route at its best, and by more than 20 per cent. during the monsoons; but the whole of the shorter route lies north of the tropic of Cancer. On the present line there is a navigation of 800 miles down the Red Sea and the Gulf of Aden after crossing the tropic of Cancer. The Straits of Ormuz, at the mouth of the Persian Gulf, down which the traffic of the Euphrates line will come, are 200 miles north of the tropic. Thus the Red Sea route is not only 700 miles longer than that by the Euphrates, but the whole of this distance, and about half as much more, are exposed to a fierce tropical heat, from which the travellers by the Euphrates line will escape.

The distance by land from the shores of the Mediterranean to Antioch is 13¼ miles. By the course of the river Orontes it is 41 miles. The difference of level is 269 ft., which gives an average fall of 6 ft. 6 in. per mile for the river, and a gradient of 20 ft. per mile for the railway. From Antioch to Aleppo the difference of level does not require a mean gradient sharper than Mr. Stephenson's original allowance for the Birmingham Railway, 16 ft. per mile.

As to cost, Mr. Andrews, who has for many years advocated the construction of this important link in our communication with our vast Indian dominions, states that the construction of the Punjaub line was attended by far more physical difficulties than appear likely to stand in the way of the construction of the Euphrates line. The transport of material was very costly on the Indian Railway, while for a great portion of the Euphrates Railway the rails and other heavy articles can be brought to within small distances of their destination by water carriage. The Punjaub line was also constructed on the 66-in. gauge, whilst the 56½-in. gauge will no doubt be used on the Euphrates line. The Punjaub line complete, including stations, telegraph, and rolling-stock, together with a magnificent terminus at Lahore, cost only 10,000*l.* per mile.

The exchange of merchandise annually between Europe and the Indian Seas was calculated thirty years ago at 1,300,000 tons, and at a value of 40,000,000*l.* Out of these articles of transport, such items as suffer materially from a sea voyage, and would thus be likely to make use of a railway, such as tea, pepper, and coffee, and also the various articles consumed in the countries on the Mediterranean, were estimated at 692,000 tons. It was further estimated that the carriage of one-tenth of the actual traffic which went by the Cape of Good Hope would pay 5¾ per cent. on the construction of the Euphrates Valley Line. The opening of the Suez Canal has modified these calculations in a double sense. It has greatly diminished the advantage of a railway over an ocean route, but it has at the same time stimulated enormously the traffic between East and West, and rendered the gain of five or six days on the voyage of far greater importance than before.

At the same time, evidence has been collected as to the actual transport between Aleppo and the shores of the Mediterranean, with which the Suez Canal cannot compete, which shows that the local traffic would amply pay for the construction of the 100 or 150 miles of line between the sea and the great river. 181,100 tons of goods were annually exported, in 1857, from Aleppo, and 179,800 tons passed through that city for export. The present cost of carriage from Aleppo to Antioch is from 4*l.* to 6*l.* per ton. Taking these 360,000 tons at the enormously reduced price of 2*l.* per ton would give a gross revenue of 720,000*l.*, or 7,200*l.* per mile, exclusive of passenger traffic, which on the Eastern lines usually amounts to about 40 per cent. of the general merchandise traffic. From Aleppo to Grane, the traffic would have to be created. But the line is the most ancient commercial route in the world, and but little doubt can exist that commerce would flow back to the ancient channel if reopened by modern enterprise.

So far, then, from the need of the Euphrates Railway being obviated by the opening of the Suez Canal, at no period of our history was it more important than at the present moment to open the line of the most rapid communication.

If it be true that the concession is obtained, it is clear that the weight of one of the first powers of Europe must have been thrown into the scale to ensure it, and that something more than a mere commercial speculation has been in the mind of that power. Under such circumstances it is not likely that the execution of the works will be delayed for want of funds. If it be true that a German contractor, backed by that aid without which he would have obtained nothing of the sort from the Porte, has a concession of the Euphrates Valley Railway, we may be certain that the completion of the line will take place at no very remote period of time.

The result of all this consideration is, that if the telegram be true, and if an appeal be made to the capitalists of Europe by Baron Strousberg for the money, we trust that the moneyed men, and the leading men, of this country will not hesitate to take such an interest in the enterprise as to secure the adequate representation of British interests on the Board. It would not be easy to deal a more deadly blow at the vital interests of Great Britain than would be effected by the construction of the Euphrates Valley Railway under such auspices as should, under circumstances to which we need not now more distinctly allude, prohibit that passage over the line of British troops which would be afforded to the troops of other and not friendly powers.

A NEW SOURCE OF COSTLESS POWER.

Costless power, if at all attainable, is so only by means of utilising wasted power; but the amount of power which, so far as regards mechanical effect, for the service of man, is wasted, is so enormous as to be practically boundless. It is in no small degree for this reason that the progress now so rapidly making with respect to both the transmission and the accumulation of power is of such cardinal importance to the future of the human race.

There are many modes in which it has been or may be proposed to utilise electric power in which this axiom has been forgotten. For example, it is very possible to attach a dynamic apparatus to a locomotive or railway train which should give light during passage through a tunnel. But then, the moment that the light was produced an equivalent drag would be put on the motion of the train; and as the steam power produced in the boiler is applied in a very costly way by a locomotive engine, the intermittent and brilliant illumination that could be produced by the train itself would probably cost more than the permanent illumination of the tunnel by petroleum lamps.

But if any motion which is not useful, or is specially one which is prejudicial, can be caught, as it were, flying, accumulated and stored up, we should regard the attempt with the utmost interest. The recoil of a gun is the most striking instance of this waste, being that, so far as the flight of the projectile is concerned, of nearly half the force of the powder. This waste constitutes the recoil. The utilisation of the recoil for the purpose of raising a heavy piece of ordnance on its mountings is thus one of the most legitimate objects of the artillerist.

In the same way, if it prove to be possible to utilise the lateral vibratory motion of a railway-train, which now all goes to damage the way or the plant, for the production of stored electricity, we might at the same time utilise power now wasted and produce a greater steadiness of running.

There is another waste movement, of a like nature, to the utilisation of which we now desire to direct the attention of the inventor. This is the roll of a ship at sea. There is very little doubt that the heavy rolling motion of a large ship is rather hostile than favourable to its progress. In the case of a floating body, which does not roll perceptibly at sea, such as the iron cylinder built for the conveyance of the Obelisk to the Thames, this is clearly illustrated. The naked negros sat astride on the great cylinder undisturbed by waves or surf, and the resistance to the tug was diminished in proportion to the steadiness of the unique vessel that it had in tow.

Now, supposing the accumulation of small power, in the dynamo-electric form, to be a solved problem, it seems to us that not only may our men-of-war be lighted gratuitously, or nearly so, but that greater steadiness of movement may be attained in rough weather.

We do not propose here to adduce a plan for this purpose, cut and dried. But we wish to point out that the object is attainable, and that by more modes than one (provided always that the accumulation is manageable).

Thus the vessel might contain a connected system of heavy pendulums, or of siphon-formed pipes in which water would act as the counterpoise, which at each roll from side to side would force a certain quantity of air through an air-pump, and thus, or even by direct mechanical action, drive a small dynamo-motor engine. Such an engine, *per se*, would be of little use in such a case. But if provided with adequate accumulative capacity, not only might enough power be stored up to light the whole vessel by night, but small cranes or capstans might be so fitted as to be able to do great service in emergency, and to give to the crew an aid far in excess of their own human power, mechanically regarded.

At the same time, whatever amount of power was thus caught from the rolling of the vessel would, in its transmission to the air-pump or other contrivance, have its reaction in proportion to its action; and this reaction would go directly to moderate the roll, and to steady the ship.

The only objection that we can foresee to this suggestion would arise from the fact,—if fact it be,—that the skin-friction, or resistance to the endlong motion of the vessel through the waves, would be increased if the roll of the vessel were diminished. On this point we desire to speak with reserve. But it seems to us that both the experiments of Mr. Froude, and the experience of the obelisk vessel, are against such a hypothesis. A steady vessel may be slower than a rolling vessel, because its keel is deeper in the water, and thus the cross-section is larger, and the skin-friction more in consequence. But give a greater steadiness, without increasing the skin-friction, and we anticipate that the resistance to endlong motion would be less, instead of more. We speak under reserve, with no pretence to dogmatise on the subject, but so at the moment it seems to us.

That the proportion of length of vessel to speed of propulsion is one of a very delicate nature we know from Mr. Froude's experiments. And we have not the slightest doubt that the mechanical saving which is to be effected by the designing and constructing of vessels with a due regard to the speed at which they are to be navigated, must be very much in excess of any possible loss that might be attributed to the control and utilisation of the roll. As to the

methods by which this might be effected we do not propose at the present moment to say anything more. We shall be content if we have called the attention of those princely shipbuilders who are ever on the look out for anything that may diminish the cost, and increase the speed and the comfort, of ocean navigation, to an entirely new field of inquiry. And we say the same with regard to those able men who are now making such brilliant and successful inroads into the darkness that veils the future. That the principle of accumulation of power will effect as great a revolution in ocean navigation as we are now dimly beginning to foresee that it is likely to do in the aid of the minor, or even of the major, industries of the day, we do not venture to assert. But we do say that the idea has enough in it to recommend it to the very careful consideration of those who have at their control the machinery for testing its truth. To steady a berth, a table, or a compass within a rolling vessel has long been a matter for consideration. But the idea of utilising the inconvenient motion which it is desired to counteract is that which we now suggest.

THE DESTROYERS OF FOOD.

In the interest of all who eat bread, who eat mutton, who drink beer, or who drink claret, we wish to call attention to the subject of a lecture which was delivered at the Agricultural College at Cirencester on the 20th of October, on the subject of insects destructive to food-producing plants. We have not seen a copy of the lecture itself, but as far as it is fair to judge from the abstract which has appeared in the daily journals, it would be well to have it printed for a penny, and widely circulated. For there is much good sense in the practical suggestion that while, on the one hand, it is desirable,—as we have long ere this insisted in these columns, —to complete and to publish a full and accurate account of all those pests which afflict the farmer, in the four successive stages of egg, larva or grub, pupa,—which is sometimes inactive as a chrysalis, and sometimes actively predacious,—and imago, or perfect insect, it is also most necessary to give some useful instruction to those who may have neither the means nor the capacity to profit by such lessons in natural history. Such is the good counsel to note the insect pest by his actions,—to watch for his destruction at those crises of his history when it may be most readily effected; and to destroy that aid, comfort, and sustenance which he may otherwise derive from the poor relations of the cultivated plants on which he chiefly preys. Such are the charlock for the turnip-fly, the nettle for the hop aphis, and the wild grasses for the weevils and other devourers of the corn crops.

Considering, however, that not a few of those who attend in youth an agricultural college are likely to do so for the sake of instruction which may hereafter be of value to them as emigrants, we should recommend any writer or speaker on the subject of destructive insects to commence with that family which, from the days of Moses (and long before) to our own, is most to be feared by man. We mean that tribe of *orthoptera* known commonly as the locust. Our indigenous representatives of this vast order,— the grasshopper, the cricket, and a few more,— can give little idea of the consternation caused by these creatures when they come in swarms. That they darken the sun is not a poetic, but a practical statement. In their steady march across the line of country on which they alight nothing that grows is spared. They sweep the face of the land bare; fire has no terror for them,—they simply march on to the bonfires made to keep them off until they stamp them out. No check, no remedy, no escape is known from a swarm of these creatures in their perfect state; but very much may be done by destruction of their eggs. In England we have perhaps little cause to dread the ravages of the *orthoptera*, though it must be remembered that every acre of ground that is allowed to go out of cultivation,—and we have 1,200,000 fewer acres under corn crops than we had in 1871,—becomes a fertile breeding-ground for noxious insects. Not only so, but negligent cultivation, scratching the soil with a hoe or even a donkey plough, allowance of the picturesque growth of weeds, idleness under whatever name it is applied to the soil, is as effective in the encouragement of insect pests as industry is in the improvement of the crops. As man fills and tills the wide wastes of the new world, the locust will gradually become less and less to be feared. But what noxious creatures may not spring from neglected tillage in older countries no one can predict, although the Russians are now learning. It is to be remembered, too, that it is not unfrequently the case that an injurious plant or animal, when introduced into a new locality, multiplies and spreads with astounding fertility. The hungry, ugly, sneaking black rat, that is at home in our sewers and neglected foundations, and that would readily make a meal on an infant in a cradle if left unwatched, is a foreign invader, and has almost entirely displaced the old English rat, which, if a predacious, is certainly a very beautiful, animal, much like a large dormouse, and of very domestic habits, and not, it is to be hoped, either so hungry or so prolific as the invader,— the Dane or Norway rat.

Again, the invasion of our waters by what has been called the "new weed," the "American weed," and the "thyme weed," of which the botanic name is the *Anacharis alsinastrum*, is a case of the extraordinary growth of a foreign pest. It was first found in England, or rather in Scotland, in 1842, in the lake of Dunse Castle, in Berwickshire. In 1851, the Rev. W. M. Hind, writing from Burton-on-Trent in July, says "it bids fair in a short time to block up one of the two streams into which the Trent here divides; and from the fact that the *Anacharis* is a dioecious plant, and that amid all the rivers and lakes into which it has spread in the vast area of country that drains into the Humber, no male plant has ever been found, it is concluded, with some probability, that the whole of this enormous mass of vegetation has sprung from a single plant, accidentally introduced on a piece of timber from North America.

With regard to the phylloxera, which has been attacked in France, Italy, and Germany with a system and intelligence such as has never been brought to the aid of the cultivator in the United Kingdom, it is even now a moot point whether it will not prove victorious over the vine-grower, and allow no respite from its attacks until it becomes extinct from the mere fact of having eaten up all its natural food. It is to be hoped that this will not be the case; but there is much fear that it will. The economic importance of these two scourges of the American and of the European cultivator is such as to lead any writer on the subject of destructive insects to call attention to the great importance of his theme by citing the most formidable cases of depredation.

It is very remarkable, however, to note how that counsel which three thousand years ago was given to the sluggard,—to go to the ant, consider her ways, and be wise,—is enforced on the same individual by insect preachers. It might be said by the ant herself, in the West Indies, and other tropical countries, meaning the white ant or termites. But this destructive creature is not really an ant. It does not belong to the order *Hymenoptera*, the bee and ant tribe, which contains so many carpenters, sawyers, masons, paper-makers, tapestry-hangers, and other insect building tradesmen, besides the famous makers of honey; but to the order *Neuroptera*, which includes the dragon-fly, for its size the most powerful of all creatures on the wing, and the most predacious of those of insectivorous habits in its perfect state. Industry, that is the moral of the story, is the source of wealth, as much almost by what it unconsciously as by what it consciously effects. The man who destroys weeds and keeps his ground clear, from industrious instincts, is rewarded by the destruction of the hiding places and feeding grounds of his insect foes at times when there are no crops on which they can subsist.

Art-Gallery for Wolverhampton. — A gentleman has written privately to the Mayor of Wolverhampton (Mr. J. Jones), offering to erect a building at a cost of 5,000*l.* for an art-gallery conditionally on the town providing a site. The donor has chosen the Mayor, the Rev. J. T. Jeffcock (rector), and Sir Rupert Kettle, as a committee to mature the plan and decide whether a museum shall be attached, and also to obtain promises of works of art, &c. When promises to the value of 10,000*l.* are obtained, or the committee are otherwise ready, the donor, who stipulates that the Mayor shall not divulge his name, will be prepared to begin the building. A site is selected near the public park.

THE PRESIDENT'S ADDRESS AT THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The following is Mr. Street's opening address, delivered on Monday evening last, as elsewhere mentioned:—

Gentlemen and Colleagues, — It is a time-honoured custom that the opening meeting of the session shall each year be devoted to a review of our position, the work we have done during the past year, the losses we have sustained, and finally, the openings which appear to offer themselves for the promotion of that which, above all, concerns almost all of us, —the advancement of the art to which we have devoted ourselves. We all know how much it pleases some of our critics to assert that the objects of this corporation are selfish first of all, and devoted to the improvement of the art and the science of building only in a very secondary degree. I need hardly waste words upon a refutation of such statements. I am content to point to the volumes of our "Transactions" for the most complete answer to them, as well as to the experience of those who have served on our Council from time to time. The real object of the Institute of British Architects is very different; we exist not only because of, but for, our art. It is not because we are architects that we band ourselves together in selfish opposition to the interests of the world, but rather that the interests of the outside world and of the profession may be harmonised and proved to be identical; and equally that our well-loved art may be more studied, more admired, better understood, and more widely practised, not only by ourselves, but by the public outside our ranks. The real interests of the public and of ourselves are identical. The obligation to carry on the business side of our work upon the highest rules of honour or integrity as between man and man is placed in the very front of the conditions of membership of this Institute. We admit of no compromise or conditions; and the condition of membership here is undoubtedly that of working thoroughly in the spirit and traditions of gentlemen. In addition to this, the practical work which we have to do is, by meetings, by reading of papers, and by discussions, to keep up and increase as far as we can the general interest in and knowledge of our art, without which neither accomplished architects nor an intelligent public will continue to exist. Naturally our work of this sort divides itself into that which relates to the scientific and that which is concerned with the artistic side of our art. I think there has of late years been rather a tendency to devote more time to the former than to the latter; but the art of building, the art of draining, and the like are exact, and do not admit of perpetual discussion. The development of attention to the study of novelty in construction is not always for the advantage of good building. Half the inventors whose circulars cover our tables every morning claim as the chief merit of their inventions that they are cheap, and I would that occasionally they convinced us that they were equally lasting. You will pardon me, I am sure, for frankly speaking my mind on an occasion such as this. I maintain that British architects are honourably distinguished for the way in which, as a rule, they deal with all those questions of new forms of construction, of water supply, of drainage, and of the general conditions on which comfort and convenience in our houses depend. English comfort is a proverbial expression almost all over the world, and our architects are fairly entitled to a large share of the credit of its creation.

I wish it were quite possible to make the same assertion with regard to our artistic successes. It strikes me more strongly, the more I think of it, that we cannot quite escape some responsibility for the bad work which is done by builders without our aid. How is it, one may fairly be asked, that, with an ever-increasing body of architects educated and trained more and more carefully, the vernacular architecture of the country becomes worse and worse every day? The vernacular architecture of a country is that which the carpenter, the bricklayer, the mason, the smith, or the plasterer does if left wholly to himself. We all know that the time was when little even of this work was wholly contemptible; take even the last century, and in such work one sees a simplicity and restraint in design, and an absence of vulgar display, which make one feel a charm in work most of which certainly never passed through

an architect's office. Go from the house built in the suburb of an English country town in 1750, to one of the houses which rise in countless numbers on all hands now, and your verdict as architects and as artists must always, I fear, be given in favour of the former. Compare the two and you will find that the taste of the eighteenth-century builder was for simple and good work before ornamental, so that he seldom came to the latter at all; whilst the taste of the nineteenth-century builder is to do everything for display, sacrificing the money which might have made his work at least substantial to an investment in so-called "ornaments" to the show fronts only of his house, which are costly to put up, costly to keep in repair, and hideous in their ghastly unfitness for their place. They have some compo keystones, ornamental railings and balconies, a few lumps of terra-cotta, "elegant" cornices and window-dressings, and highly-suggestive chimney-pots; and for the sake of these the house has walls and floors so thin that every sound can be heard throughout, and so weak that in a heavy gale you rock in your bed. For all this, of course, we are only indirectly responsible, but I do think that we must allow that too many, if not all of us, think too much of the fronts of our buildings, and so have practically brought up a whole generation of builders and workmen to believe firmly that all buildings ought to have a show front, whilst we so often sacrifice solidity to the pleasure of creating what we call ornament that we have led them naturally to assume that ornament is an object by itself to be clapped on to a building at all hazards, and even at the sacrifice of solidity. I should much like to see your attention more and more turned to this large and serious question. It deserves discussion and action. For, depend upon it, some screws must be very loose indeed in our system if all our work is so wholly outside the world as not to influence the vernacular architecture of the people for good. My only suggestion at present is that our duty is to show by example that simple building may be quite as good as extravagant, and that the essence of all good architecture is that it should be solid and lasting before it tries to be ornamental, and that ornament is a feature which grows out of utility, and cannot be applied to a building like a loose-fitting garment to cover defects or to distract attention from parts which are not supposed to be seen. It is unworthy of architects to build what is in its very nature ephemeral, and I wish heartily that, before all questions of style, this vital one of solidity were always present to us when we are making our plans. Depend upon it, the builders who have been trained by architects who never build what is not solidly and well constructed are much more likely to build for themselves in the same spirit and way, than they ever are if they have been otherwise taught. And, after all, it is the work done by builders without the intervention of an architect that we see wherever we move in this ever-increasing city, and in others similarly conditioned. It is work which it ill becomes us to treat as non-existing. It is, on the contrary, one of the very first necessities of the day that we should, in some practical way, deal with it.

There is another question to which the one just mentioned naturally leads, and this is one as to the extent to which we may be able to affect, in the interests of our art, the future architectural arrangements of the streets and buildings throughout our great cities. To state the case in this way is perhaps in fact to answer it, as far as relates to direct interference with or influence over what is done by municipal authorities; though as our Institute boasts properly that it is a British and not only a London institution, our object ought always to be to keep this fact well before us, and to act even out of London whenever the importance of the case demands it. In 1876 the late Mr. Wyatt, in the course of a discussion on Mr. Eastlake's interesting paper on the work and history of the Institute, told us that the author had omitted to mention one proof of the growing influence of the Institute. This he saw in the request which had just then been made to us, to exercise control over the designs and elevations of buildings in Northumberland Avenue; a request which became, I believe, a law to the extent of making it necessary that all these designs should be "submitted" to the Council of the Royal Institute of British Architects. Well, I know not, gentlemen, what the general feeling on this subject is now. Some, I know, agreed with the view which I took at the time, that the position we were taking was a dangerous one, and one that could do no sort of good to our art. The taste of the individual members of a council may be excellent; but there is an unwillingness on the part of a body of men to criticise too severely, or to agree in suggestions as to the alteration of, the work of a brother architect. Opinions differ round our own table as to what is best, sometimes even as to what is good, to such an extent as to end in approval being given to works in a general way to which probably every one of the Council in his own heart can see little good. Nor is this all. The elevations alone, which are not complete without plans, are submitted; modifications of a very simple kind alone can be and are advised, the advice is neglected, and the building is, after all, erected with little, if any, attention to the opinion of the Council of the Institute. In the end, if Northumberland Avenue ever becomes an avenue of buildings, the Institute will have to ask itself whether the control it has exercised has been sufficiently strong, and the result so good, in comparison to that of the streets in which we have not been able to interfere, as to justify Mr. Wyatt's satisfaction. For myself I have no hesitation in saying that it would be better, if we are to have no more power than at present, that we should have less.

I do not think it right to close the few words I have to say on the Northumberland Avenue question without endorsing what fell from my predecessor in this chair on the subject of architects who are members of the Metropolitan Board. He was speaking of the business relations which constantly bring members of our body, as well as the Institute itself, into correspondence with the Metropolitan Board of Works, and he concluded with the expression of an opinion, in which I concur so completely, that I think it only right to repeat it. Mr. Whichcord's words related to the composition of the Board. "Architects," he said, "may be elected members of that Board just as barristers, solicitors, and doctors may be so elected. It would be ridiculous to say that professional men shall not sit at that Board because they may have had a pecuniary interest in some of its public building transactions. But I shall run no risk of censure when I say that a Fellow or an Associate of this Institute, if he be elected a Member of the Metropolitan Board of Works, ought not, from that moment, to have any professional connexion whatever with the purchase of land offered for sale or lease by the Board; nor should he be professionally engaged in the superintendence of buildings to be erected on land which is the property of ratepayers whose agent and representative he is." Such a statement is so obviously right and beyond question, that I am sorry it should be necessary to repeat it.

Upon the broad question of giving general advice through our Council, I feel sure that the Government, or the governing bodies of our great cities, might well, and with advantage to themselves, consult us from time to time on the preliminaries of great building operations; and I have no sort of doubt that we should always be willing to give the best help in our power. Whether the points to be settled are the best routes for new streets, the best sites for great public buildings, or the best openings for architectural improvements, it would be advantageous to every one if the subject were laid before a committee of experts,—such as the Council of this Institute is,—for its advice and opinion. Take such cases, for instance, as the choice of a site for the New Courts of Justice; or as to the choice among various schemes for the placing of the New Government Offices which are even now required; or as to the conditions on which railways are to be brought into London or across our river, and it is obvious that our opinion might well be asked, and almost certainly be acted on, with advantage to the world and without prejudice to any one. In the last case, for instance, can it be doubted that, if we had been consulted, the House of Commons would never have allowed the London, Chatham, and Dover Railway to erect its bridge across Ludgate-hill, and to erect a second and almost equally ill-placed bridge across the Thames, within a few yards only of another built on wholly different lines? Nor would the South-Eastern Railway have been permitted to build the two gigantic and odious sheds on the river side, which have been the ruin of so much of the beauty of the matchless prospect. Such subjects lead me to say how useful a function this Institute might perform if it could keep a more active surveillance on the mode in which the works of deceased artists are dealt with. I am not among the passionate admirers of such a work as the General Post-office, but at any rate it was a consistent design, carried out in an honest and uniform spirit, and complete in outline and character. New wants have arisen since it was built; Rowland Hill has come and gone, and more and more accommodation is required. But it is almost beyond credence, that some of that increased space should have been obtained by a series of erections on the roof of the original building, hideous in themselves, and wholly careless of the effect produced, or even of having in themselves any architectural character at all higher than that of a third-rate house or workshop. Yet so it is. And perhaps it was because for years the porticos and colonnades of another great public building,—the British Museum,—were entirely filled with glass cases and partitions, without any outcry from the public or from us at such a defacing of a consistent and costly design, that the Government which represented the country was so heedless of the monstrosity of which it was guilty, when it made the additions to the Post-office. Nor is it out of place here to ask when the front of the Colonial Office in Whitehall is to be finished? Its architect evidently prepared for the erection of two towers or pavilions at the angles of the front towards Whitehall. His proposals were not acted on,—and there to the present day stands the building with its two most important angles evidently unfinished. Every day a large proportion of the members of both Houses of Parliament, and most of the Ministry, pass under the walls of this unfinished front, without, I suppose, one thought of the injustice done to the memory and reputation of one of the greatest architects of his time. Surely on such a question as this the Institute of Architects, if no one outside will move, ought to take some action.

Then, again, I hope we are all agreed that there is no work in which we can, as a body, do better service to our art, or more certainly show our real sense of its value, than by sturdily opposing all schemes for the destruction of existing works of architectural art, or constructions of historical or archæological interest. We have, as you know, a committee for the conservation of ancient monuments; it is a strongly constituted committee, and its existence cannot be too widely known. There is always work for it to do. Take, for example, the case of the City churches. It is no exaggeration to say for myself, what I doubt not very many of you feel also, that when I return from some foreign travel, and cross the railway bridge into Cannon-street, I feel a pride in the architectural beauty of the City of London, which is never lessened by contrast with what I have been seeing elsewhere. And to what, may I ask, is the beauty of this view owing? There is a magnificent river and a sublime bridge, but beyond and above these a cluster of towers and steeples, of so much variety of design, so skilfully treated, so picturesque from every point of view, as to afford unending delight. In the year 1800 there were 107 churches in the City, in the year 1877 only ninety-five remained, and of these there were no less than thirty-one scheduled as "at present" to be pulled down. Only the other day another of Wren's reputed churches, St. Matthew's, Friday-street, was said to be condemned, and though the particular case is not a strong one, it seems to me high time that this Institute should strain every nerve in order to save any more such regrettable destruction of the buildings to which London owes so much of its beauty. If architects stand by quietly, it may be assumed that there are no artistic objections to such work. We may still permit men to go on in the cheap and easy fashion of making our ancestors' piety and liberality pay for building and endowing churches which we, with all our increased wealth, choose to think we cannot afford to erect; and by the time that all the empty churches (consequent largely on a non-resident clergy) have been removed, and their sites sold for counting-houses, shops, banks, and what not, men will awake to the discovery that the architectural beauty of the City is a thing of the past, and that the loss is irremediable. At the West End I hope the same words of warning are not required. We have been appealed to in reference to a rumour that St. Margaret's, Westminster, was to be taken away. This is a constantly-recurring rumour. The newspapers probably think that every one

wishes it removed. They forget that it has just been refitted at great cost, that it is a building full of architectural and historical interest, and they are not aware that the builders of our great churches and cathedrals, being artists, had never any objections to the erection of small buildings near to, or in contact with larger ones, to which they gave infinitely more value and scale than they otherwise possessed. I am glad to be able to assure you, however, in this case, on the best authority, that there is no foundation whatever for the rumour. It is remarkable to notice how much is lost on all sides for want of some active hands to save threatened works of art. We look round on the Paris, the London, the Florence, the Cairo, the Venice of our youth, and find that on all sides work has been destroyed, apparently mainly for the sake of change, for the loss of which no new building will ever atone. In London there is the well-known case of the colonnade of Burlington House, taken away upon the understanding that it should be rebuilt, but lying in a mouldy heap somewhere on the other side of the river. In some similar limbo, we suppose, are the stones of Temple Bar, for the re-erection of which in some spot not far from its old place, such, for instance, as an entrance to Temple Gardens, one would suppose that funds might without difficulty have been found. Farther to the west is an even more interesting work,—the water-gate at Buckingham-street, Adelphi,—treated in an even more ingeniously spiteful way. For here the lovers of the beautiful have created a garden with lawns and shrubs and winding walks, which one would suppose might have been allowed to undulate as well as to wind. At any rate, even now the level of the garden might be lowered for some distance on either side and in front of the gateway, and Inigo Jones's work might again be seen in its integrity, instead of being earthed up to nearly half its height, and of having its archway used as a receptacle for rubbish, and the decay of its old stonework hastened as much as possible by the piles of damp earth and plants carefully placed against it by the landscape gardener. And, to conclude, there is the case of the church in Edinburgh, for taking down and rebuilding which, on a new site, stone for stone, the railway company were bound to, and did, provide the funds. Here, again, the stones remain in a heap, and the Corporation, unless they are much traduced, have kept the money for their own municipal purposes.

I might easily multiply examples of the same kind. They all seem to point in the same direction,—to the necessity in such a country as ours for the creation of a Government department of the Fine Arts, whose office should be not only to give order to our magnificent but often confused and inaccessible collections, but to take care that our national buildings and our historical monuments are classified and preserved as far as possible from further damage, either at the hands of time and weather, or at the equally-destructive hands of those who (as in the case of the Post-office) have no hesitation in wholly destroying the architectural character of a great public building. I believe that the appointment of such a ministry might be followed very soon among other things by an addition to our museums, which has often been urged strongly,—but hitherto unsuccessfully,—of a museum of casts. Every one admits the advantage to students of art of such a museum. Berlin has shown us the way, and the expense could not be so great as to be a difficulty in the way of so rich a country as this is. Moreover, it seems to be a necessary complement to the other collections which have been accumulated within the present century, as affording the very best means of educating the eyes of a people who are undoubtedly holding their own against foreigners in all artistic matters far better than they did before such museums were first of all formed. The collections at South Kensington, to which all who are interested in our art must always most gladly confess their indebtedness, contain, no doubt, a good many most valuable casts, but they represent only comparatively modern art, and even then are in no degree whatever complete, and they are not, as they should be, exhibited by themselves, or classified in such a way as to be thoroughly useful to students. I hope that we shall keep this subject well before us, and that no opportunity will be lost of pressing upon Government the sense that this Institute must feel of the importance of such an addition to our national collections. It is a feeling which is sharpened in us by the knowledge of the fact that such a museum would, to a very large extent, illustrate the close connexion which ought to exist between the work of the sculptor and that of the architect. The best works of the greatest sculptors have nearly always been their decorations of architecture; and the evidence of this necessary connexion before the eyes of the people is the best way of familiarising them with the fact, and of leading them to feel the want in our own buildings, in which, even when the architect has advertised his desire to see sculpture introduced, the spaces he has left for it are still, as a rule, conspicuous by their emptiness. The Government which, with a large and wise liberality, would deal with such questions as these, would secure for itself perhaps less temporary popularity, but would have the satisfaction of knowing that it more permanently benefited the highest interests of the community than it could by exclusive attention to purely political questions, and as such work ought to be independent of party, what one set of ministers undertook would not be likely to be undone by their opponents or successors.

At the recent Conference, the question of competitions led to much discussion, and the resolutions arrived at have been discussed by the Council, who will ere long lay before you the result of their deliberations. The position which I hope will be taken by you will be to arrange that in the event of a competition being indulged in, due securities should be given for really accomplished assistance, or advice, or judgment on the competing plans, not only in regard to technical questions as to compliance with conditions, but at least as much on true artistic questions, which are even more to be thought of and more vital. But it is, I hope, no part of our business or duty to do so much in the way of facilitating competitions as to lead the world to suppose that we are in any sense whatever admirers or encouragers of a system the defects of which, under the best arrangements, are so many and so patent that the best men keep themselves wholly or almost entirely out of reach of them, with the result that works which result from competitions are seldom those which we look back on with the greatest satisfaction.

Our Conference in its discussions leaned rather to the merely business-like side of our work; but let us hope that this was corrected in some degree by the visits paid to various buildings and collections in the metropolis. Of the latter, those to Buckingham Palace and to Sir Richard Wallace's were the most important. Probably we all regretted that the palace of our well-loved Sovereign was not more worthy, in structure and in decoration, of so great a monarch. Your Council desired me to express their sense of Sir Richard Wallace's singularly courteous treatment of us at Hertford House, in which I am sure I represented the unanimous opinion of our members.

Our numbers still continue to increase. Last year at this time the total number of Fellows and Associates was 716. The additions during the year have been 28 Fellows, 143 Associates, 9 honorary Associates, and 9 honorary and corresponding members; and deducting the losses which we have sustained by death or otherwise, our numbers now stand at 370 Fellows and 491 Associates, a net gain of 19 Fellows and 126 Associates. It is to be hoped that this large accession of new members does not mean that we are reaching a lower level of qualifications so much as that the Institute is becoming more recognised as the centre of our work. A large increase of members involves also an increase of our means, and additions to our library, which is rapidly increasing, and is now of great value. Another addition to our means of doing good work is Mr. Godwin's generous foundation for the promotion of the study abroad of modern structures and building improvements and adaptations. This has the special peculiarity of being open to all British subjects of any age, and though it is not educational in quite the same sense as most of our other prizes, it will, there can be no doubt, be of high value in its results to the profession.*

Melbourne Cathedral.—The *Melbourne Argus* of September 28th, says:—"A donation of 5,000*l.* has been offered anonymously towards the completion of the Anglican Cathedral, Melbourne, on condition that 25,000*l.* is contributed from other sources before the close of the year."

* The remainder in our next.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE opening meeting of this Institute for Session 1881-82 was held on Monday evening last, the President, Mr. Street, R.A., in the chair.

Certificates of Proficiency were presented to Messrs. Arthur Marshall, William Henry Thorp, Alexander Pope, and John Dent Harker, passed candidates in the Class of Proficiency at the twelfth and final Voluntary Architectural Examination, 1881.

The following gentlemen were balloted for and declared to be duly elected, viz.:—

As Fellows:—William Leiper, Glasgow; John Slater, B.A. (*Associate*), Bedford-row; Daniel Brade, Kendal; William Harvey (*Associate*), Whitehall; Capel Nankivell Tripp (*Associate*), Gloucester; Henry Thomas Gordon, Basinghall-street; and William Eade, Ipswich.

As Associates:—Robert Barton Morgan, Birmingham; Lawrence George Summers, Nottingham; John Tweedale, Leeds; Thomas Ames, Bathampton; John Henry Eastwood, Red Lion-street; Horace Thomas Bonner, Lewisham; George Elkington, jun., Cannon-street; Arthur Edmund Street, M.A., Cavendish-place; Arthur Edward Lloyd Oswell, Shrewsbury; George Thomas Poole, Southampton; James Martin Brooks, Wellington-street; Maurice Charles Hulbert, Queen Anne's Gate; George Borer, Finsbury-circus; John Henry Curry, Tulse-hill; Alfred Millwood, Hammersmith; Percy Paul Green, Hampstead; Edward William Mountford, Buckingham-street; John Wardle Bulcock, Blackburn; Arthur John Gale, Surrey-street; William Jacomb Gibbon, Oxford-terrace; Ernest Augustus Eckett Woodrow, Hornsey-rise; Walter Blackwell, Millman-street; Arthur Charles Bulmer Booth, Bennet's hill; James Tolley, jun., Cannon-street; Thomas Batterbury, Great James-street; Richard Mauleverer Roe, Leadenhall-street; John Malcolm, Queen Victoria-street; Henry William Peck, Gower-street; Joseph Porter Power, New Broad-street; Edward Alan Jackson, Chancery-lane; Henry Petit, Welbeck-street; Alfred Augustus Bonella, Montague-street; Henry Gregory Turner, Chancery-lane; Andrew Edwards, Red Lion-square; Peter Dollar, Great Marlborough-street; and Francis Lennox Canning, Westminster.

The President then delivered his inaugural address, the first half of which we print in preceding columns. The delivery of the address concluded,

Sir Frederick Leighton, P.R.A., said,—In obedience to the commands of the Council of this Institute, I rise to ask you to express, by a vote of thanks, your appreciation of the very remarkable address to which you have just listened. The duty thus placed in my hands is doubly grateful to me. As an honorary member of this Institute, I hold it to be a great privilege to be permitted, on such an occasion, to ask for this vote. As a member of the Royal Academy, I rejoice in the opportunity given to me of doing homage on his own throne to that efficient and devoted officer who sits on the right of the president at the councils of the Royal Academy. Gentlemen, I need hardly say that I do not propose to follow minutely the vigorous and lucid address to which we have just listened, but I would ask your permission to address to you one or two observations that have suggested themselves to me on a perusal of the address which I owe to the kindness and courtesy of your secretary. Now, in the very forefront of his remarks, Mr. Street has touched a chord to which every lover of the building art must, I think, warmly respond. He has lamented, as well he may, the vast amount of building work,—if it may so be called,—which rises to the right and left of us in weary acres in all directions, wherein the architect, indeed, has neither hand nor part, and in which a reckless,—I had almost said, a criminal,—structural flimsiness vies with a depraved vulgarity of taste. Now under the first of these vices no doubt the chief sufferer is the occupant; but the effect of the other is more far-reaching. To the great masses of men the sum of their perception in matters of taste is naturally but the result of those fugitive impressions which follow one another, hardly observed at the time, in the daily routine of their lives. Now I know nothing more certainly calculated to numb and deaden whatever latent spark there may be in those masses of a perception of beauty, than the constant inhaling of what I may call the miasma of ugliness. I hope, with Mr. Street, that the frequent example of solid, tasteful, and simple work may exercise a counteracting influence, and I may add,—what he surely thinks, though he did not say it,—that in no more certain way can you contribute indirectly to what I may call the chastening of taste than by promoting the love of solid, sober, and honest workmanship, because with that love of solid and simple workmanship comes of necessity that dignified and sober tone of mind to which meretricious tawdriness is wholly foreign, and, in fact, absolutely repugnant. The contemplation of the uncontrolled production of ugliness in this

country has inspired Mr. Street with a desire to see the establishment of a minister invested with powers of control in certain matters of art, and there is no doubt that in theory, in the abstract, a great deal can be said in favour of such a proposal. There is no doubt that the constant and vigorous influence of a competent minister of art, checking with authority all that is bad in art, and fostering with favour all that is good, would be a most beneficent influence; but I cannot help feeling that there is much to be said on the other side, and that many grave difficulties would beset such a scheme. In the meantime, there is one controlling influence more potent than all, and which I think all of us should make our very best efforts to direct and control. I mean the public taste. That alone is potent in the long run for what is good and what is bad in art. I believe, however, that so long as there exists amongst the public a grotesque indifference to beauty, and a callous indifference to ugliness,—until the people have a higher sense and a more refined perception of beauty, the career of the true architect will be, I fear, a lifelong struggle against the solid and serried ranks of the Philistines. But amongst those schemes for which the aid, if not the initiative of the Government is indispensable, I am glad to see that our President gives prominence in his address to one in which I have taken a great interest for some time,—I mean the collection of a large and scientifically comprehensive museum of casts, such as we see already in Berlin, and not only there, but, either in completion or in process of creation in several Continental cities, as, for instance, in Paris and Munich, and even in little Switzerland (I forget whether at Berne or at Zurich). When we consider that in all contemporary scientific research, or in nearly all, the keynote is evolution, and when we consider further how faithfully the evolution of the tone and temper of nations is mirrored in their art, and how much we learn, that we cannot learn elsewhere, of the history of nations from their arts, it does strike me as very extraordinary that in this country, which is the very stronghold,—nay, the very cradle—of evolution, so little should have been done for the study of that great principle in art. While biology, anthropology, sociology, and philology have received much attention in connexion with the theory of evolution, it is curious that archæology should have taken a place in relation to this subject so little adequate to its merits as a guide to the study of mankind, quite irrespective of its intensely fascinating interest viewed on merely artistic grounds. That a perception of this shortcoming is ripening in minds in which it may eventually lead to practical and fruitful action I venture to say that I have some reason to hope, and I do not doubt that some day, possibly not very remote, the young English archæologist may study at least the rudiments of his science without the necessity of going to a foreign country for that purpose. I will only touch upon one more point. So loyal an Academician as Mr. Street could not fail to have alluded to the development which the study of your great art has taken of late in the schools of the Royal Academy. But he did not allude to one matter which I know has at least as much weight with him as with me. I allude to those provisions by which the Royal Academy has sought to more closely knit together the three arts which are its care, and to eliminate and set aside any barriers which may have existed hitherto between class and class, and which may have prevented the interchangeability of the study of the three arts by all students alike. These provisions are made as inducements as well as privileges. I very earnestly hope that they will be very freely used, and that they may conduce to the consolidation of the three noble arts, which are akin. I have much pleasure in moving that thanks be given to your President for the very excellent address which he has just delivered to us.

Mr. A. J. B. Beresford Hope, M.P., said he felt it to be a very great privilege to be allowed to second the vote of thanks which had been moved with so much taste and elegance by the President of the Royal Academy. It was an extremely masculine, able, sensible, well-spoken, and admirably-composed address which Mr. Street had delivered. He used all these adjectives not for the sake of piling up a fluffy, fulsome compliment, but strictly critically, and as definitions as accurate as on the spur of the moment he could give of the qualities of the address. Having known the heart-searchings and the trouble and anxiety of preparing similar, though, he was afraid, far inferior addresses to be delivered by him from that chair, he was entitled, he thought, to congratulate Mr. Street on the triumph he had achieved. The address afforded instruction for the members of the Institute and instruction for the world: "*Urbi et Orbi*,"—*urbs* being that room, and *orbis* the morning newspapers of the next day. He had listened with very great interest to that portion of Mr. Street's address in which he had dealt with the suggested Ministry of Fine Arts for this country, and he had also listened with equal attention to the passing allusion to the subject made by Sir Frederick Leighton. He had often spoken of the subject before, and, coupling what had been said by Mr. Street with the words of caution which fell from the President of the Royal Academy, he thought he might say that a Ministry of the Fine Arts, if it would do enough, and not too much, would be an admirable addition to our public offices. He remembered that some few years ago it was very much the fashion in some quarters to advocate what was called "regularity" in the architecture of our public buildings and streets, and it was suggested that such regulation should be the care of a permanent official. Against such a proposal he most strongly protested. A permanent official entrusted with such duties would have the effect of stereotyping taste in building. He would be the suburban builder *in excelsis*. The proposal to have a permanent director of arts, in that sense, was one to be utterly and absolutely scouted. Who was to be the Minister of Arts? The departmental minister who sat in the House of Commons or House of Lords had his own mysterious master concealed behind him, in the shape of the permanent under-secretary of the department. Of course, if there was to be a Minister for Art there must be a permanent Under-Secretary for Art. By all means let there be a Minister for Art if he be an ideal minister, but, at the same time, let care be taken that the permanent under-secretary did not become the permanent overseer. The proposed Ministry of Arts should not be so powerful as to be able to override such bodies as the Royal Academy, the British Museum, and the Royal Institute of British Architects, and to make them serve as mere departmental *bureaux*. He did not say this with a view to throw "cold water" on the proposal, but merely to show the difficulties that beset the question. If the Institute, as the recognised mouthpiece of the profession of architecture, was true to its mission in every way, it would cease to be sneered at from the front benches of the House of Commons.

The motion having been put to the meeting,

Mr. Street, after expressing his thanks for the way in which his address had been received, said he was quite aware that there was a great deal more to be said on some of the subjects he had touched upon, and especially with reference to the question of a Ministry of the Arts.

MODERN EASTBOURNE.

The rapid progress which Eastbourne is at present making as one of the most popular seaside resorts in the south of England is a striking proof of what can be effected by public spirit and capital, and of how an almost-unoccupied and straggling series of hamlets can be converted into a handsome and well-laid-out town, with miles of streets, ornamented by noble terraces and princely mansions. In order fully to appreciate the transformation which Eastbourne has undergone within a comparatively short period, it is necessary to compare its present extent and population with what it was little more than twenty years since. The number of its inhabitants at that period was 5,700. Ten years later, that is, in 1871, its population had risen to 10,352, whilst according to the last census returns, only a few months since issued, it now has a population of 22,500, showing that during the decade between 1871 and the present year, the population has considerably more than doubled itself, the increase within that period being about 125 per cent. In 1857 the total number of houses was 400, whereas the Eastbourne Local Board have now on their books 5,000 as the number of houses within the district under their control, and a few weeks ago we were informed by Mr. Schmidt, the building surveyor, who courteously afforded us other information, that within the last six months he has passed the plans of 400 new houses, many of them detached family residences and other high-class structures, which are at present in course of erection. The present rateable value of the town affords another illustration of its rapid expansion. In 1845 its rateable value was 10,000*l*., whereas it is now, in the year 1881, upwards of 100,000*l*., the increase being thus tenfold within a period of thirty-six years.

There can be no doubt that the Duke of Devonshire, who owns the greater portion of Eastbourne,—estimated to cover an area (including the Parade) of nearly 6,000 acres,—has been the main cause of its remarkable development and expansion. An esplanade is, of course, regarded as an indispensable requirement at all seaside localities, and this feature Eastbourne already possesses on a scale which may at once be described as unique, whilst it is at present in course of extension, both in a south-west and in a north-east direction. It is estimated that in roadmaking, drainage, and the formation of the parade, the Duke has expended no less than 300,000*l*., and in extending the parade still further westward, he is now expending a further sum of 50,000*l*. This extension is from the point known as the Wish Tower to what may be termed the foot of Beachy Head, at Holywell, which now, with the village of Meads, forms a part of New Eastbourne. What is called the Marine Parade, in an easterly direction, is of the ordinary watering-place character, but the western section, named the Grand Parade, with which the Duke of Devonshire is specially identified as its constructor, is one of the most picturesque in the country. It is in terrace form, consisting of both an upper and a lower promenade, connected at intervals by flights of steps, the slopes between the upper and lower promenades being planted with flowers and shrubs, amongst which tamarisk is prominent. Another specially distinguishing characteristic of this portion of the Parade consists of large and commodious shelters erected at intervals along the promenade, together with a continuous range of forms and seats. From the point where the extension of the Parade commences to its terminus at the foot of the hill leading up to Beachy Head, there is continuous ascent, and the slopes between the upper and the lower promenades are of considerable depth. In order, therefore, to connect them, winding roadways down the slopes are being constructed, as well as steps. Messrs. Wallis & Wallis are the contractors for the extension. Running parallel with the Parade extension, the Duke has just completed the extension of the public road from the Wish Tower to Holywell and Meads, the road gradually rising until a high level is attained at Holywell, from which there is a commanding marine view. Several fine terraces of houses fronting the sea have just been erected between these points, whilst others are now in progress.

It is immediately opposite the terminus of this road and the parade extension that the large and handsome Convalescent Hospital and chapel, designed by Mr. Woodyer, of Guildford, is situated. The building, standing within its own pleasantly-laid-out grounds, was erected at a cost of 42,000*l*., accommodating upwards of 200 patients. In consequence of still further accommodation being required, a new wing has just been added, the contractors for the building being Messrs. Wheeler Brothers, of Reading. This new wing was opened on Thursday last, the 10th inst., when, with the sanction of the Bishop of Chichester, there was a special service in the chapel, the sermon being preached by the Rev. George Body.

The parade eastward has already been completed from the Wish Tower to the Anchor Hotel, and it is now being further extended in a north-easterly direction to the Great Redoubt, or eleven-gun battery. In connexion with this extension a strong sea-wall is in course of construction. The extension is 1,800 ft. in length, and its estimated cost is 34,000*l*. Mr. John Jackson is the contractor. The works are being carried out by the Local Board at the cost of the ratepayers. It will thus be seen that upwards of 80,000*l*. is at present being expended in parade works alone. The entire length of the parade from north-east to south-west, when these works are completed, will be nearly three miles.

A very comprehensive system of sewerage, from the designs of Mr. Shone, of Wrexham, has just been carried out, at a cost of 36,000*l*. Large ejector works near the Archway Tavern, complete the drainage of the town. The works

commence inland at Old Eastbourne, which is about one mile and a half from the sea in a north-westerly direction. The several sewers converge at the sea side, and have their outfall at Langney Point, situated about four miles from Eastbourne—a sufficient distance to preserve the bathing sites intact from sewage contamination. The outfall pipes are carried a long distance out seaward, so as to prevent the possibility of the sewage being washed back at high water to the shore opposite the town. Eastbourne is likewise fortunate as regards its water supply, which since the year 1859 has been chiefly in the hands of the Duke of Devonshire and a company of proprietors associated with him. In that year the duke bought up the rights of a small local company, and had new works constructed. In connexion with these works there are three spacious reservoirs. The largest of them is situated on high ground, 400 ft. above the sea level, and in the locality leading to Beachy Head. It is about the summit of a beautiful spot not inaptly named Paradise, immediately overlooking the Duke's mansion and grounds in the valley below, called Compton Place, and which is at present occupied by his brother-in-law, Mr. F. J. Howard. From this elevated spot there is a charming and commanding marine view on the south-east, together with an extensive view inland of the country for miles around, on the north-west and north-east sides, Pevensey Castle, Hastings, St. Leonard's, and the locality adjacent, being conspicuous in the more immediate distance. The capacity of this reservoir is equal to 2,000,000 gallons. The water is pumped up into this and the other reservoirs from deep wells passing through and filtered by the chalk, which is a guarantee for the excellence of its quality. It is thence supplied to the town on the gravitation principle. The rapid increase of the town renders an extension of the existing works necessary, and those works are now in course of construction. They consist of the sinking of another well, together with the erection of new buildings and pumping machinery in connexion. These are situated not far from the existing works, but on the opposite side of the railway, and about a quarter of a mile from the Eastbourne Station. The new well is being sunk to a considerable depth through the chalk, until it arrives at the greensand, whence an abundant supply of pure and excellent water is said to be obtained. Over the well an engine and boiler-house are in course of erection, the foundation-stone of which was formally laid about a fortnight ago by Miss Currey, daughter of the Duke of Devonshire's solicitor. The engine-house has a main frontage of 70 ft. in length and 65 feet in height, with an ornamental chimney-shaft carried to a height of 150 ft. There is also a further frontage of 70 ft., this portion of the buildings consisting of a low block, containing the boiler-house. The buildings are faced with stock bricks, having stone and red brick dressings and string courses. The cost of the works, including the engines and machinery, will be 15,000*l*. The architect is Mr. Henry Currey, of Norfolk-street, Strand.

As regards the numerous private residences and other buildings which are being erected in rapid succession, there is a distinctive speciality about them deserving notice. The long lines of structures on the parade facing the sea, and in the several streets and roads immediately adjoining, are all, as a rule, faced with Portland cement, and in their architectural features are altogether different from those in the new roads more inland which continue to be laid out. Amongst the more prominent buildings on the parade are the hotels, several of which are large and costly structures. These include the Grand Hotel, nearly opposite the Wish tower, towards the west end of the parade; the Burlington Hotel, a little further eastward, is likewise a large and handsome building. The two most striking buildings in the town, however, of this class, whether as regards their architectural features or capacity, are the Cavendish and the Queen's Hotels, the last named of which has only been completed within the last few months. The Cavendish, which has a lofty elevation with a central portion and two wings, is at present in course of enlargement and completion by the erection of the second wing. The architect is Mr. T. Knightley, and the contractor, Mr. James Peerlee, of Eastbourne. The Queen's, which is the most recently erected hotel in the town, is situated at the east end of the parade, a short distance westward of the great Redoubt, and has a range of frontages, containing six stories each. Including the ornamentally laid out grounds, which are partially devoted to lawn tennis, the hotel covers an area of more than an acre in extent. Internally it has accommodation for a very large number of visitors since the completion of the new wing a few months since. It has a spacious entrance-hall, 33 ft. square, from which, along a wide corridor, a number of noble apartments on the ground-floor are reached. These include the *table d'hôte* room, 70 ft. by 35 ft., in addition to a spacious bay, 24 ft. by 12 ft.; also a coffee-room, 47 ft. by 23 ft.; a drawing-room adjoining, 35 ft. by 17 ft. together with a reading and writing room, and a billiard-room. The first and second floors contain a large number of private sitting-rooms, and on the remaining floors there are ninety-six bedrooms. Mr. Henry Currey is the architect, and Messrs. Wallis & Wallis, of Eastbourne, are the builders. The cost of the hotel, exclusive of the furniture, which was supplied by Messrs. Maple, of Tottenham-court-road, was 40,000*l*.

Amongst the public buildings and other attractions in the immediate neighbourhood of the parade, a public pleasure-ground on high ground around the old Martello-tower, named the Wish Tower, must be noticed. The site of this, which is between the carriage-road of the Grand Parade and the sea, has been ornamentally laid out, and is much frequented by visitors. The pier, which was lengthened a short time ago, and is now 1,000 ft. long, is a favourite promenade. In addition to the facilities for bathing on the shore by numerous well-appointed bathing-machines, an extensive and handsome block of buildings, forming salt-water swimming-baths for both sexes, have recently been erected on a site fronting one of the new streets, a short distance inland from the parade; and close adjoining, still further inland, is the Devonshire Park, an ornamental recreation-ground, twelve acres in extent. In the park there is a spacious pavilion, in which concerts and other entertainments are held. During the season there are performances in the park every morning and evening, by Jullien Adams's band, and a special feature is that the pavilion, as well as the grounds, is illuminated by the electric light. The land for both the baths and the park was presented by the Duke of Devonshire to the companies formed for the construction of the two establishments respectively.

The Eastbourne of the present day, which is manifestly destined yet to make more rapid strides, and ultimately to become one of the most important towns in Sussex, may be described as consisting of the localities comprising old Eastbourne, Southbourne, Sea Houses, and Meads. These hitherto disconnected and straggling congeries are fast being converted from a purely rural into a thickly-populated urban neighbourhood, forming a large and ornamentally-laid-out modern town and charming seaside resort, having all the advantages of marine views in combination with beautiful inland walks and scenery in almost every direction around. Under their Act of 1879 the Local Board's district extends to all the several districts above named, over which they have large powers in connexion with the laying out of streets and the erection of buildings. This Act gives them control over the materials and workmanship employed in every new building, likewise providing that no new building shall be occupied as a dwelling-house until the drainage has been completed, nor until the building has been certified by the building surveyor as fit for habitation. There are also other stringent provisions as to foundations and other matters, so that the sanitary condition of all new residences in this interesting locality ought to be well secured. In laying out the several new roads in various directions a noticeable feature is the preservation of full-grown trees, imparting to a large proportion of the roads the Boulevard character. This more especially applies to the hamlet of Meads at the north-west of the town, adjoining Compton Place, where large numbers of houses of the villa and mansion class are in course of erection, and which is not unlikely to become the Belgravia of Eastbourne. As we have already observed, the character externally of the new buildings in Meads and other roads inland materially differs from those on the parade. The materials of the former as a rule consist of red brick and flint, with gabled frontages and red tiled roofs.

From the extreme west end of the parade the carriage-drive is continued along the Meads-road shaded by a long avenue of elms and other full-grown trees, leading to South-street, in the direction of the railway station. It is at this point where the new Town-hall is about to be erected, designs for which have been prepared by Mr. E. W. Schmidt, building surveyor to the Local Board. The building is intended to be in the Classic style of architecture, and will be two stories in height. It will be faced with red brick, and will have stone dressings and columns, the ground-floor having Doric and the upper floor Corinthian columns. It will have a central tower, carried up to a height of 50 ft., with three stories, and in which will be the principal entrance. This will lead into a large hall, and stone staircase, which will give access to the upper floor. The building, amongst other apartments, will contain a large court-room, 75 ft. by 80 ft., with retiring-rooms for the magistrates; also a board-room, 40 ft. by 27 ft., for the meetings of the Local Board, together with the offices of the clerk to the board, the town surveyor, and building surveyor; also, committee-rooms, jury-room, inspectors', rate-collectors', and general clerks' offices. The total cost of the building is to be 14,000*l*. The site is at Stock's Bank, fronting South-street, which, under the board's Improvement Act, is at present being widened and re-constructed.

Eastbourne is noted for its schools and other institutions of an educational character, and amongst other buildings of this class which have recently been erected is the new college in Compton-place, an establishment covering a large area of ground, with accommodation for upwards of 100 students. Eastbourne College, another establishment of the same class, consisting of an extensive range of school buildings and dormitories, is situated in Blackwater-road, not far from Devonshire Park. A large building, containing library, reading-rooms, and lecture-rooms, has likewise been erected near the Queen's Hotel, under the auspices of the Mutual Improvement Society. Churches and chapels are erected in quick succession. On what is known as the Upperton Estate a new church, called St. Andrew's, has just been erected from the designs of Mr. Haddon, of Hereford, the contractors being Messrs. William & John Crow, also of Hereford. A new Baptist chapel, nearly opposite the site of the new Town Hall, was opened about a month since; whilst a large Presbyterian church a short distance from the Devonshire Park, is almost completed and ready for opening. In South-street new choir-schools and residences are being erected for the choir-boys of St. Saviour's Church, close adjoining. St. Saviour's, which was erected some few years ago, from the designs of Mr. G. E. Street, is the largest and most costly church in Eastbourne. It is Gothic in style, with a lofty tower and spire, and is elaborately decorated internally.

The accommodation at the railway station has been found to be altogether inadequate to the traffic to and from Eastbourne, and the station is at present being considerably enlarged. The extension will add two double lines, and arrival and departure platforms, each about 600 ft. in length. It is stated that the entire re-building of the present booking-offices, and the whole of the station buildings facing Terminus-road, is ultimately intended, and that there is a probability of these contemplated works being carried out in conjunction with the South Eastern Company, in connexion with a branch of the last-named company's line between Battle or Robertsbridge, and Eastbourne.

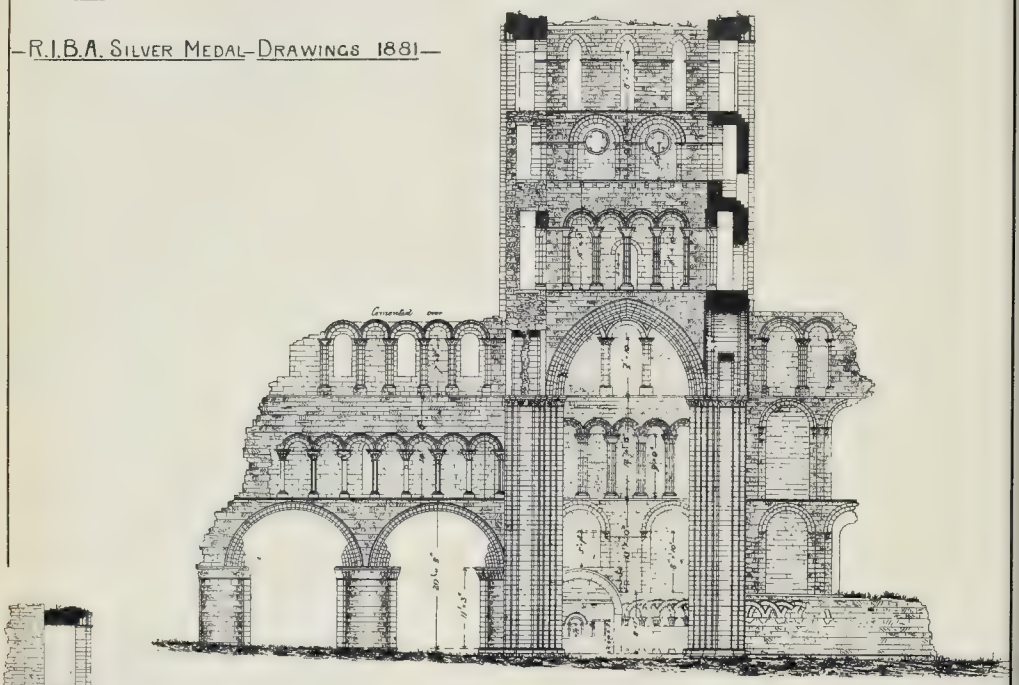
In closing this notice, we may state that, by the liberality of the Duke of Devonshire, a spacious building has just been erected at the summit of Beachy Head, close to the coast-guard-station, for the convenience of the numerous visitors who daily make the ascent to that elevated spot during the season, where tea, coffee, and other kinds of refreshment can be obtained, but no intoxicants.

MESSRS. AGNEW'S ART GALLERY, LIVERPOOL.

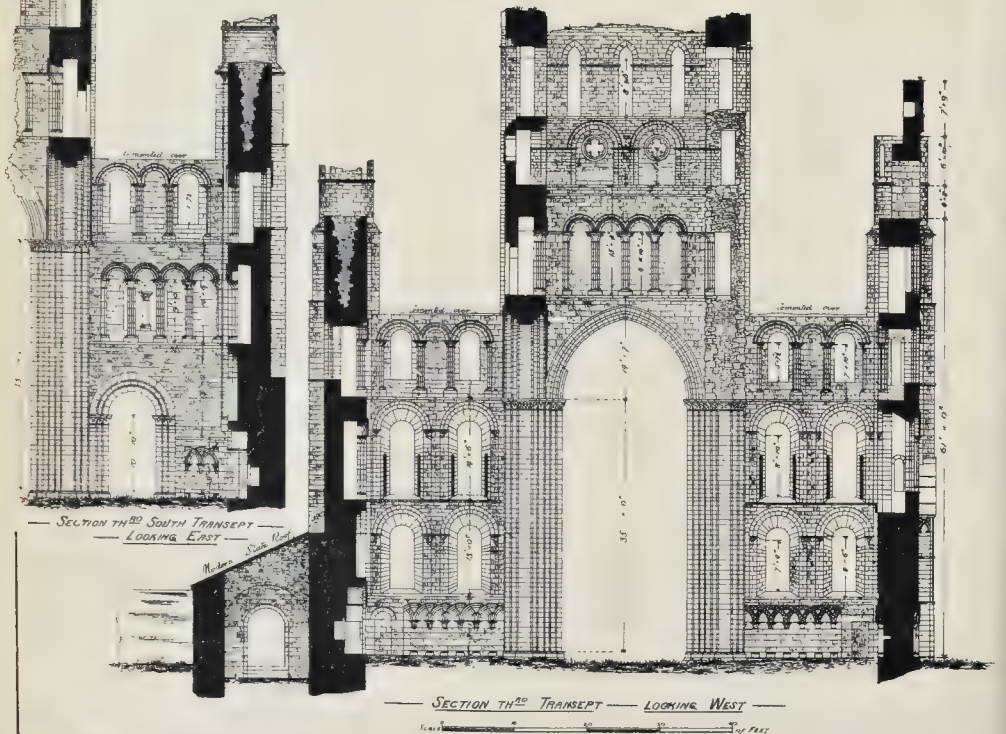
We give a sketch of part of the new gallery which has been erected for Messrs. Agnew, in Liverpool, from the designs of Messrs. Salomons & Ely, architects. The exterior is carried out entirely in red bricks from Maidenhead set in white putty, all cut and rubbed; the mouldings are cut on the spot and the carving is done in the brick. The interior is fitted up in American walnut and pitch pine; the cost was about 11,000*l*. Messrs. Haigh & Co., of Liverpool, were the contractors for the whole of the work.

—Abbey of St Mary and St John — Kelso Scotland—

—R.I.B.A. Silver Medal—Drawings 1881—



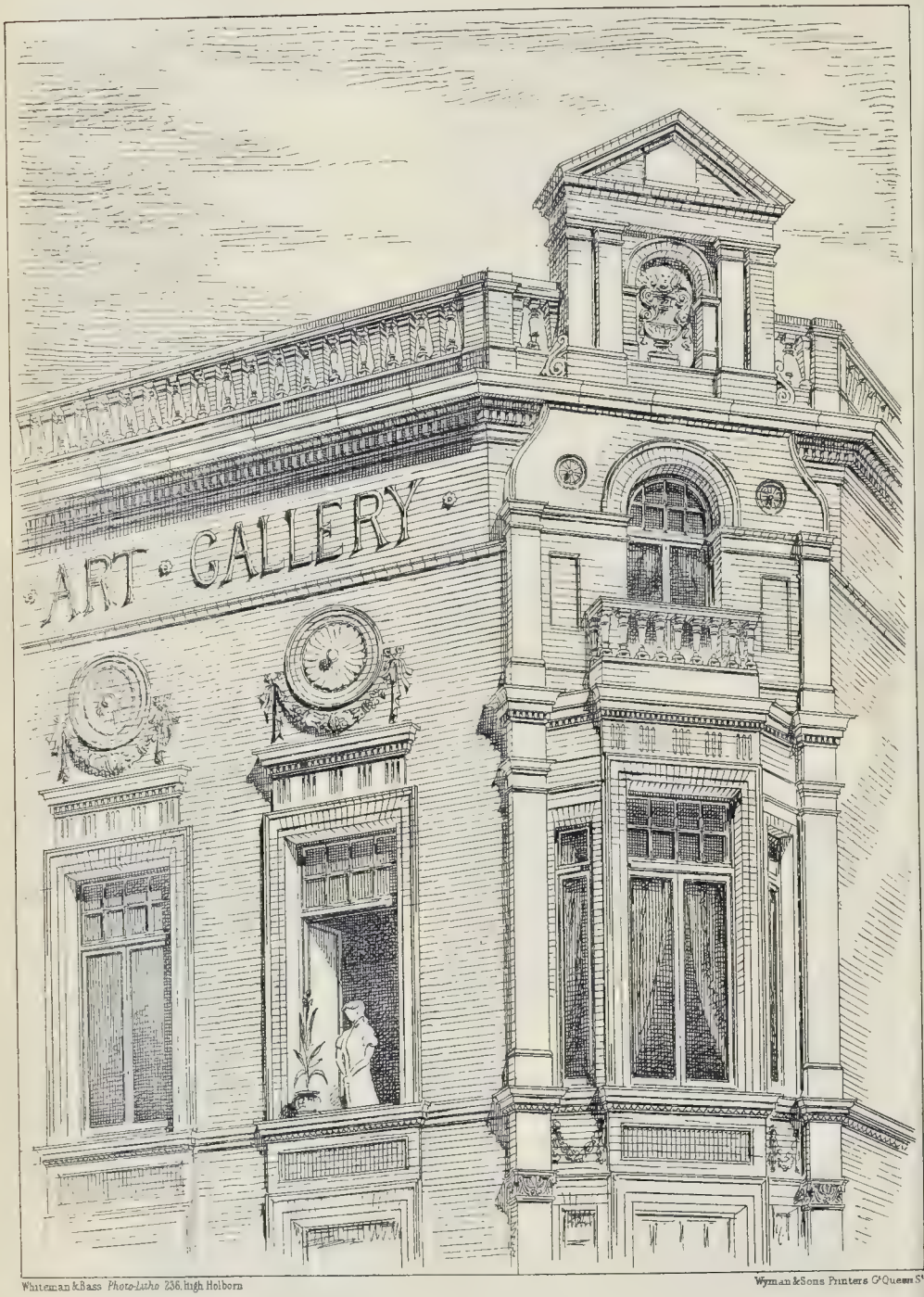
—— Longitudinal Section —— Looking South ——



—— Section thro South Transept —— Looking East ——

—— Section thro Transept —— Looking West ——

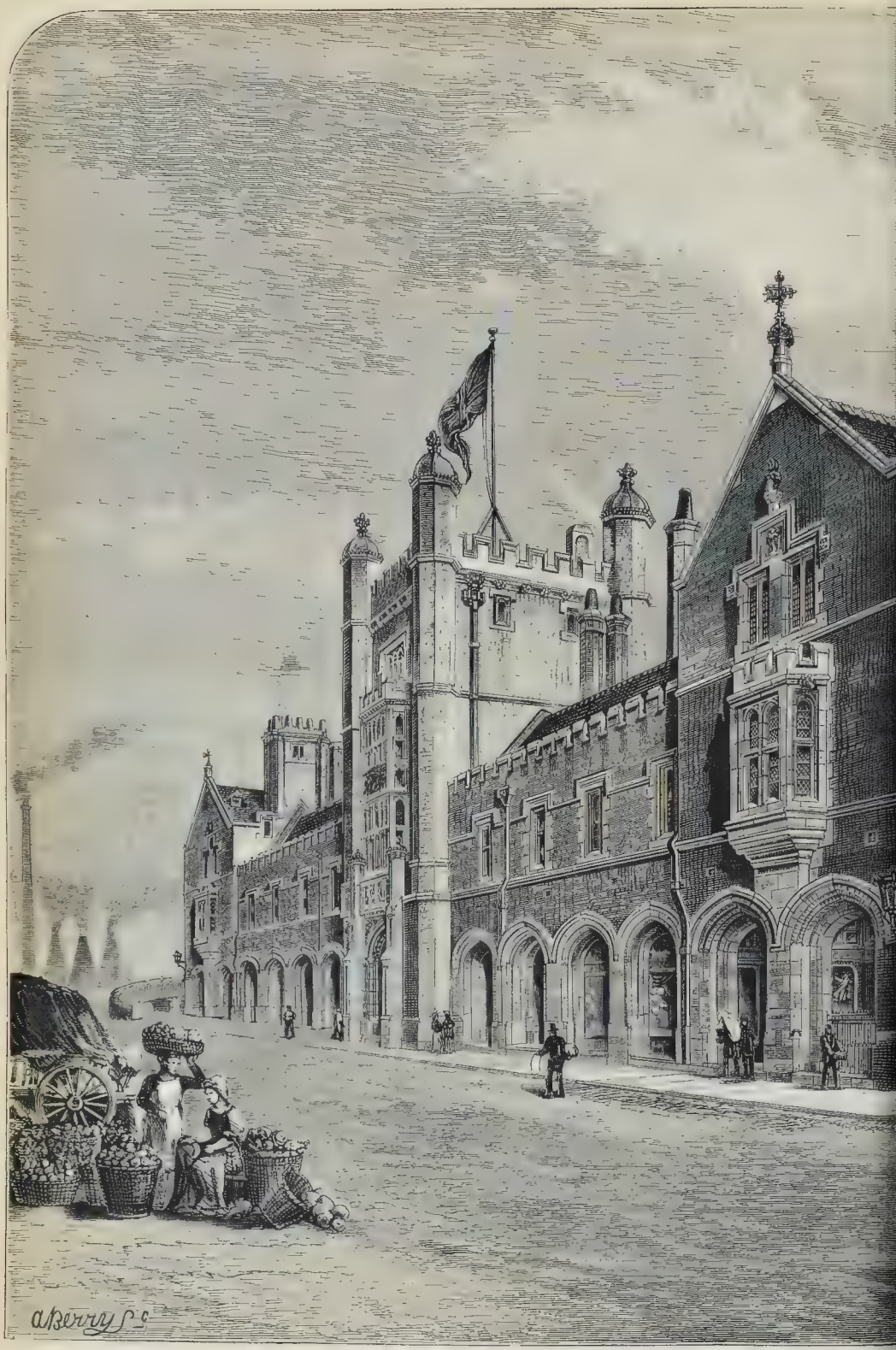
Wyman & Sons, Printers, Great Queen St.



Whiteman & Bass *Photo-Litho* 236 High Holborn

Wyman & Sons Printers 74 Queen St

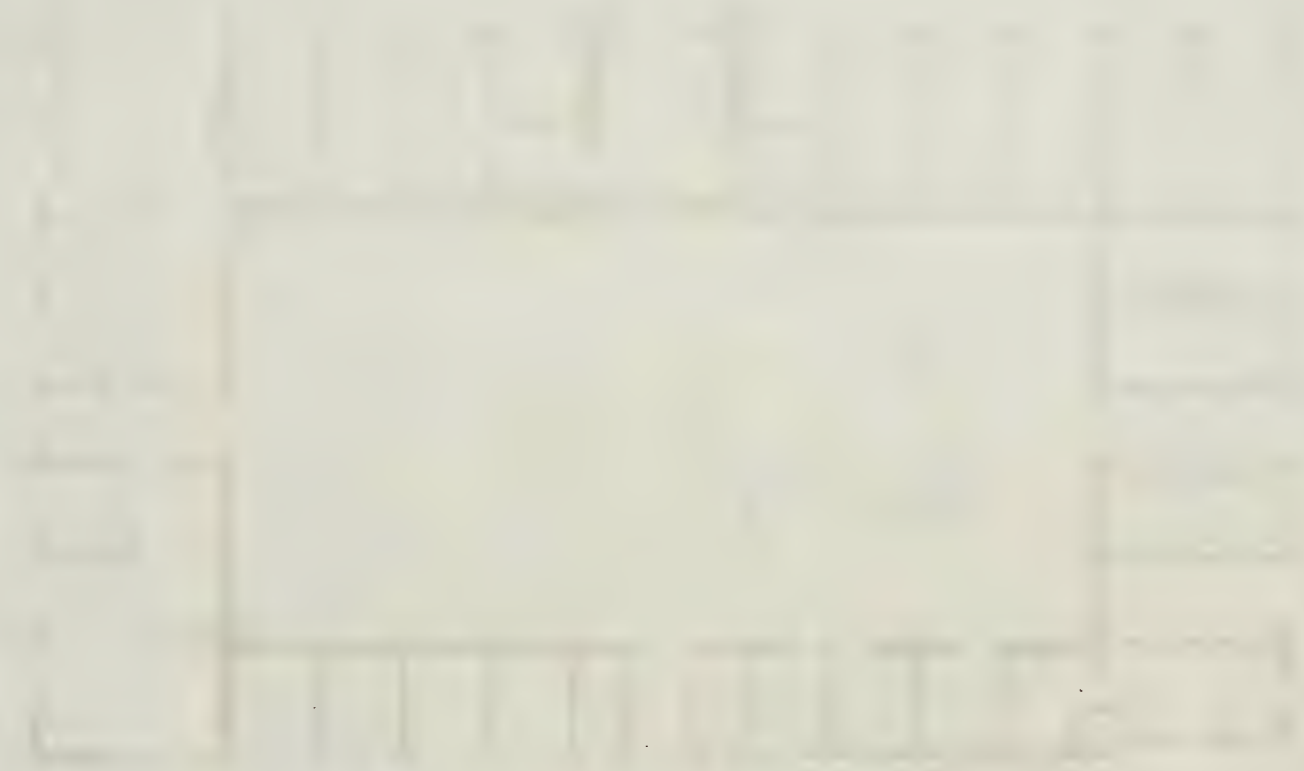
MESSRS. AGNEW'S ART GALLERY, LIVERPOOL.—MESSRS. SALOMONS & ELY, ARCHITECTS.

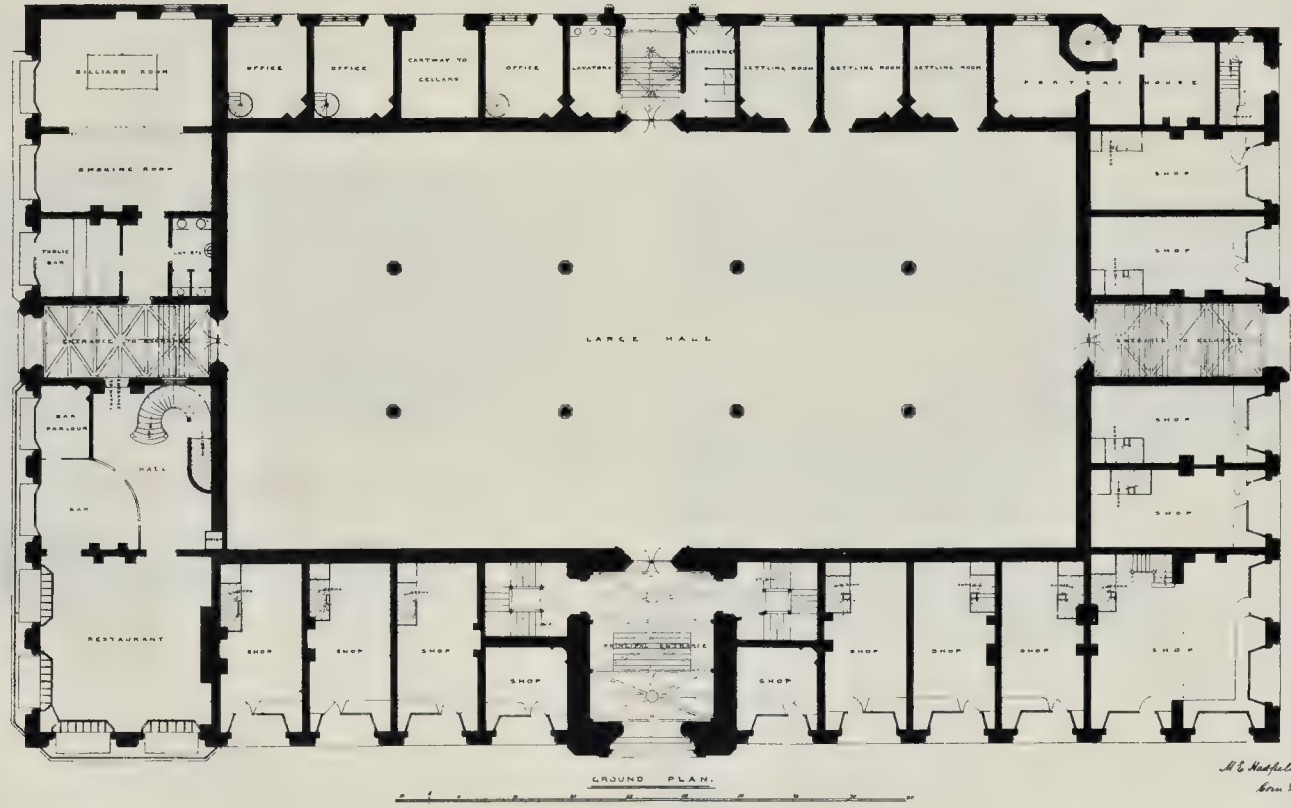


NEW CORN EXCHANGE, SHEFFIELD: FOR HIS GRACE THE



NORFOLK, E.M.—Messrs. M. E. Hadfield & Son, Architects.





M. E. Hadfield, Hon. Architect
Corn Exchange Chambers
Sheffield.

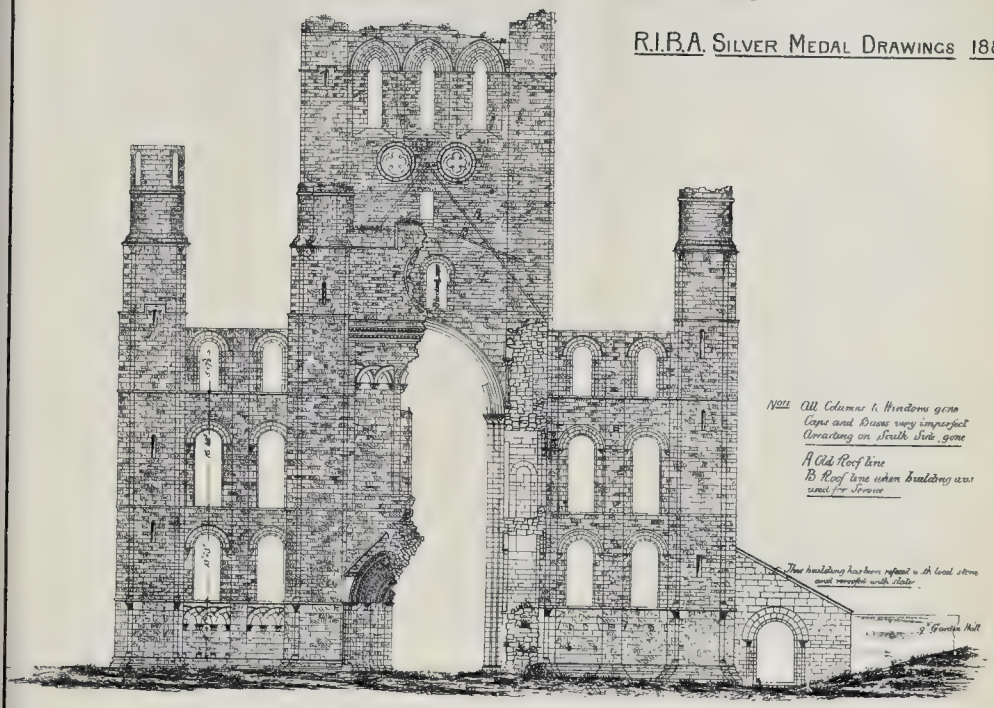
Whiteman & Bass, *Photo Litho* 236, High Holborn

Wyman & Sons, Printers, 74 Queen St.

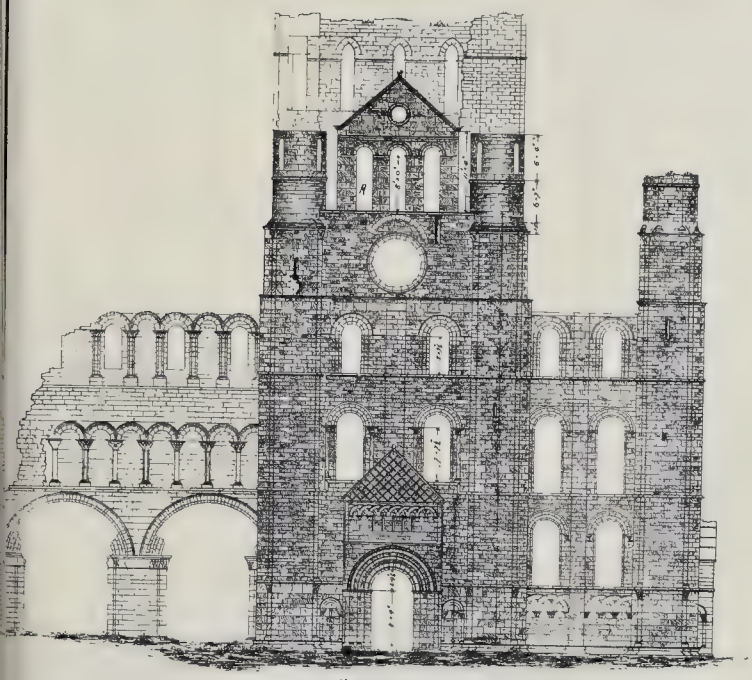
NEW CORN EXCHANGE, ESTATE OFFICES, &c., SHEFFIELD, FOR HIS GRACE THE DUKE OF NORFOLK, E.M.

ABBEY OF ST MARY AND ST JOHN — KELSO SCOTLAND —

R.I.B.A. SILVER MEDAL DRAWINGS 1881



— WEST ELEVATION —



— NORTH ELEVATION —

Scale of feet

Arthur Rice Cranston
1881

Wyman & Sons, Printers, Great Queen St.

KELSO ABBEY.

Kelso Abbey, which forms the subject of some of our illustrations, was founded on the 2nd of May, 1128, by King David I. of Scotland, and was dedicated to the Virgin Mary and St. John the Evangelist. It was inhabited by a reformed class of Benedictine monks, originally established at Tiron, in Picardy. King David's only son, Henry, the heir apparent to the throne, who died at Roxburgh about the middle of June, 1152, was buried within the walls of the building. James III. of Scotland was crowned here in the month of August, 1460, with great pomp and ceremony, more than 100 knights being created to commemorate the event. The monastery of Kelso is frequently mentioned in history as the place of meeting of the representatives of the kings of England and Scotland for the ratification of treaties and truces. The sacred building was twice burned, first during the contest that arose out of the rival claims of Bruce and Baliol for the Scottish crown; and in 1545, during the Earl of Hertford's invasion. It was never again rebuilt, but it was in all probability somewhat restored, as about twenty-one years later Queen Mary spent two days in Kelso, when she did no doubt take up her quarters at the Abbey. After the Reformation it was put into some sort of repair, and converted into a parish church, where the congregation continued to worship until the year 1772.

The ruin, as it stands now, is a fine specimen of Norman architecture. The form of the building was that of a Latin cross; the head of the cross, contrary to the general practice in ecclesiastical architecture, is turned towards the west, and the longest limb towards the east. The only parts which are still tolerably entire are the western end, which contains, among other features, a segment of a magnificent archway; the central tower, rising over the intersections of the cross, of which the north, south, and west sides remain; and the walls of the transept, with the northern entrance to this portion of the church. Of the eastern end, which seems to have consisted, when entire, of a choir and two side aisles, all that now remain is one of the walls which upheld the main roof, and separated the choir from the southern aisle. This wall rests upon two arches, with piers, and the superincumbent structure has within its thickness two tiers of galleries, one over the other, opening to the interior by a series of small round arches. In 1592 the lands and possessions of Kelso Abbey were conferred on Sir Robert Ker, of Cessford, whose representatives as Earls, and afterwards Dukes, of Roxburgh, have retained possession ever since.

A. P. Gunston.

THE NEW CORN EXCHANGE, SHEFFIELD.

This building, of which we give an illustration, has been in course of erection for about three years.

The new structure comprises a central hall for the use of the corn-factors, 150 ft. long and 75 ft. wide, and 35 ft. high. The roof, which is entirely of oak, is in five spans or sections, supported by stone pillars, having arched oak principals. This arrangement has been adopted to secure the steady north light so necessary for the corn-dealers, and, in addition to the sky-lights, there are five three-light windows in the eastern gables. There are four entrances to the hall, and the settling-rooms, lavatories, &c., are arranged on the eastern side of the hall. There will be space for 100 desks or movable stands on the floor of the hall.

The principal façade of the building, which occupies the site of the old Haymarket, is 225 ft. long, and the lateral elevations are each 135 ft. long.

A first-class commercial hotel, with ample accommodation, occupies the northern front. There are thirty-two bedrooms, spacious restaurant, billiard and smoking rooms, and private sitting-room. The offices are very complete, occupying the basement, with extensive cellarage.

Along the west and south fronts are spacious sale-shops, with mezzanine floors and basement, kitchen to each, the Dennett system of arched flooring being used throughout.

There is extensive cellarage under the central hall. The chamber-story is occupied as the Duke of Norfolk's estate offices, and there are also suites of offices to let.

The design, as shown in the illustration, is of the Tudor type, the materials being thin red bricks, with stone facings from a quarry on the estate, of a durable texture and warm colour.

All the roofs are covered with brindled Broseley tiles. In the centre of the west front is a gateway for the principal entrance, which is groined in stone, having a flight of ten steps to approach the hall. In the upper story is a fire-proof-room for all the muniments, plans, &c., of the estate.

It may be interesting to state that, the foundation being very unsatisfactory, it was necessary to underlay the whole with concrete, composed of five parts of broken stone and brick ballast to one part of ground Barrow lime, and the result is everything that can be desired.

The whole work was designed by Messrs. M. E. Hadfield & Son, and executed under their personal attendance, Messrs. Tomlinson & Sons being the contractors, and Mr. R. W. Payne the clerk of works.

The heating and ventilating arrangements are carried out by Mr. W. W. Phipson, C.E., and the carving throughout has been executed by Mr. McCulloch, of Kennington-road.

Messrs. Hardman & Co. have executed the wrought-iron gates and ornamental ironwork.

The cost of the building will be about 55,000*l.*

FRENCH AND FLEMISH GALLERY.

We can hardly say that the winter exhibition at this gallery, which opened last week, is of much interest, though, of course, it contains some good pictures. The work which is put forward as the prominent one, and which in regard to scale and elaboration is so, Brozig's "Une Fête chez Rubens," is disappointing. It shows the interior of the princely painter's house, a large room garnished with rich furniture and numerous paintings, and occupied by a number of guests, ladies and gentlemen, including portraits of various artists and other notabilities among the painter's contemporaries. Rubens stands in the centre of the groups, introducing two new arrivals to his wife, who sits near him. Among the group of ladies beside her is the reduced likeness of the face and headdress of the "Chapeau de Paille," coming out very prettily among the less refined faces of the more Dutch type. The painting is rich and full in colour, but impresses us too much like a contrived grouping on a stage; and there is a want of incident for so many figures: a number of the personages seem not to know exactly what to do with themselves, and to be sitting there just to fill up the scene. The men and women are grouped together, respectively, on opposite sides of the room, in a manner which increases the somewhat "stagey" effect of the whole.

There is nothing stagey about the work hung opposite, De Neuville's painting of French troops "Setting Fire to a barricaded House at Villersexel, January 9th, 1871." The painting has the same characteristics of spirited action, realism, and truth of detail, which have characterised other works of the same class by this admirable painter of battle scenes. De Neuville does not ignore the heroism of warfare; on the contrary, he is one of the finest illustrators of it, for he gives it us without tinsel; but he shows the sadder and less effective aspect of the game of war also with terrible truth. He is, whether intentionally or not, a kind of Erckmann-Chatrian among painters.

There are two landscapes by Herr Heffner (6, 24), brilliant in their effect of light and perspective, but a trifle hard. Mr. W. H. Bartlett's "Neighbours" (46) is a realistic and not very refined painting of two young artists working in a room whence they have a view of the feminine occupant of the opposite rooms watering the flowers in her window. There is nothing in any of the figures to interest us, but the precision of local colour and detail, and the clear atmospheric effect, call for much praise. A little interior by the same artist, "Kept in" (49), has similar qualities in even more marked extent, and is an admirable little work. Herr Schloesser's old man engaged in tying "a troublesome tie" is an admirable bit of humour. M. Laugée's group, "La Veuve" (139) has interest and pathos, far more than a larger picture, "Orphans" (95), which is hung in a place of honour at the top of the room, and bears the name of R. Wylie; the tone is agreeable, but the faces are absolutely without modelling, and seem all cast in one mould. There are other paintings that are below what we used to regard as the standard of this gallery, — much belo. wDuverger, Chevilliard, and other old favourites in the gallery, are represented, and Windmaier and Munthe among landscape-painters; and we must not omit Miss Hilda Montalba's "Sorting Crabs on the Lagoon, Venice" (107), pleasant not only for good drawing, but rich and fine tone. Looking about for rising talent, we will mention that Miss H. L. Corkran shows good advance in No. 125, "A Normandy Peasant Girl."

AN ANCIENT ATHENIAN CHURCH AND SARCOPHAGUS.

A German archæologist, writing from Athens on the 16th ult., reports the discovery there of numerous remains of one of the earliest Christian churches of that city, together with a sarcophagus containing the skeleton of an ancient bishop, Clematios. In laying the foundations of a house at the foot of the Lykabettos, there were found, at a depth of 0·65 mètre, the traces of the niche of an altar and of a building belonging to the oldest Christian period of Athens. Among the objects found the most interesting are:—

1. Two postaments, square-shaped, with the basis of a column of the Ionic style. It is of Pentelic marble, of good workmanship, of the oldest Christian period. The height of the postaments is 0·70 mètre, and diameter 0·55 mètre.

2. Two cornered capitals of columns, with pillars of Pentelic marble and fine reliefs of the Christian era. The length is 0·77 mètre, breadth 0·45, and height 0·32.

3. Two portions of small capitals, also of Pentelic marble, 0·22 mètre high, with a cross and small reliefs of the Christian style.

4. A four-cornered decretal column of Pentelic marble, 1·15 mètre high, 0·45 broad, and 0·15 thick. This contained an inscription, which unfortunately has been for the most part erased by some tool used in stone-work. Two lines only (in Greek characters) are legible and run as follows:—"*epsēphisato [he]x Areiou Pagou boulē.*" (The council of the Areopagus voted . . .) This column had evidently been brought from another part of Athens and employed with other materials in building a Christian church. The date of its erection, there is reason to believe, was during the reign of Constantine the Great. There are indications that the church was destroyed by fire either under Julian the Apostate (363 A.D.) or during the second invasion of the Goths under Alaric (396 A.D.).

From among the numerous pieces of marble, tiles, tablets, &c., here found, it is to be inferred that the edifice was of considerable size. It manifestly served as a common house of prayer, and stood on the churchyard and Christian burial-ground that existed at that spot in the first four centuries of the Christian era. This opinion is confirmed by the discovery of numerous Christian tombs there, and more particularly by the finding of a sarcophagus (on September 21st). This contained the remains of one of the first bishops of the city of Athens, although, until this discovery, his name was unknown. At a depth of 0·85 mètre the workmen, in digging, came upon a marble plate, which the house-proprietor had brought out and cleansed with great care. It was a white marble tablet, of good workmanship, with a smooth surface and an inscription. It was 2·30 mètres long, 1·06 wide, and 0·07 thick. About 0·04 mètre from the upper edge there are three Christian monograms inscribed on the tablet. The use of such abbreviations on Christian tombs was not customary till the period of the reign of the sons of Constantine the Great, 337 to 361 A.D. About 0·05 mètre below these three monograms stands a fourth, with the following clear inscription:—"*O en 'osiois episkopēsas Klēmatios*" (Clematios, the superintendent,—or bishop,—in sacred things). The letters of this inscription belong to the Roman-Christian period. They are precisely similar to those on a column erected in honour of the Roman Hipparchus Herculius at the expense of Plutarchus Nestorius, a Neo-Platonist who taught philosophy in Athens about the year 398 A.D. Unfortunately, the inscription just found contains no chronological mark. There is a little hole in the tablet, the object of which is not clear. After the tablet had been brought up by the workmen, they found beneath its original position a layer of stones or masonry of ancient date, to which the tablet had been attached by a thick layer of

mortar. All this having been removed, the hollow interior of the sarcophagus was come to where lay the skeleton of the former Athenian bishop. The length of the sarcophagus interior was 2·10 mètre, width 0·85, and depth 0·95. Of the four sides, one is cut out of the Lykabettos itself, while the other three are very strongly composed of tiles. Each tile is 0·40 mètre long, 0·30 wide, and 0·04 thick. The four sides were all covered with marble tablets, each 0·04 mètre thick. The sides were fastened together by bent nails, and nails were used to attach the sarcophagus proper to them. In this sarcophagus the excavators now found the remains of Bishop Clematios. His head was to the south, and his feet towards that part of the Lykabettos where the traces of the church altar had been found. The entire skeleton was covered with a layer of dust or clay 0·05 mètre thick. Only the lower portion of the skull was well preserved besides some of the teeth of the upper jaw. All the other bones were in a perfectly crumbling condition. It is strange that nothing else was found in the sarcophagus to denote that the deceased was a bishop; no ornament nor coin was there, such as those often found in the early Christian tombs opened in 1832. The bishop, however, appears to have been buried in his robes of office, as there were remains of colour on all the marble tablets. When Bishop Clematios lived is a question not easy to settle. But his date was probably soon after Bishop Pistos, of Athens, who attended the First Synod of Nicæa. Bishop Clematios flourished, therefore, either under the first successors of Constantine the Great, between 337 and 361 A.D., or a few years before the second irruption of the Goths in Athens. This conjecture as to the date is supported by a sarcophagus of an entirely similar character that was found a few years back in the catacombs at Rome, and which belongs to the year 355 A.D.

BUILDERS' BENEVOLENT INSTITUTION.

ANNUAL DINNER.

The thirty-fourth anniversary festival of this Institution took place (as briefly announced by us last week) on the 3rd inst. at the Freemasons' Tavern, Mr. George Burt, J.P. (of the firm of John Mowlem & Co., and ex-Sheriff of London and Middlesex), President, in the chair, supported by about 280 friends of the charity. The usual loyal and patriotic toasts having been disposed of (Major Brutton and Captain Bird responding for "The Army" and "Reserve Forces" respectively),

The Chairman, in proposing the toast of the evening, "Success to the Builders' Benevolent Institution," said the Institution was founded in 1847 chiefly by his very old friend the late Mr. Thomas Cozens,—all honour to his name. Its object, as they all knew, was to grant pensions to master builders and their widows, and others connected with the building trades. The number of pensioners who had been assisted by it, exclusive of those now on the list, was 129, and there were at present 23 men and 30 women in receipt of annuities at the hands of the Institution. The average age of the men in receipt of the benefits of the Institution was 70, and that of the women 72, and the amounts of the pensions granted were 39*l.* per annum for the men and 27*l.* per annum for the women. Widows of pensioners retained their husbands' pensions during life. The pensioners must have been in good circumstances to make them eligible, and of the age of not less than sixty years,—and there was one applicant at the present time for the benefits of the Institution whose age was eighty-four. The average time that pensioners remained on the list after election was from seven to eight years. It would, therefore, be seen that the pensions granted by the Institution did materially soften the last years of the lives of the old people, and that the charity was one which was of great service. The pensioners had been at one time in good circumstances, but causes perhaps not their own had led them to seek the comparatively small pittances given by the Builders' Benevolent Institution, the support of which was the real duty of the builders of London. He was sure it was not necessary that he should say much in appealing to the company to support the Institution to the utmost of their power, for he had already appealed to them in connexion with Mr. Godwin's generous offer, with a result that had been very gratifying, and he heartily thanked the very numerous friends of himself and the Institution for the way in which they had rallied round him and come to his support on that occasion. He sincerely trusted that as years rolled on the friends of the Institution would be able to gather together and invest such a sum of money as to render them less dependent on the appeal made on the occasion of the anniversary dinner. He felt that it was the duty of the master builders of London to endeavour to enable the Institution to attain that position as speedily as possible, so as to enable the work of the Institution to be efficiently supported from year to year independently of fluctuations in the amount of support given to the chairmen at its annual dinners. Many of those present would know some who had been seeking the benefits of the charity, and some of those to whom he was speaking might some day stand in need of its aid. Surely, then, they should all do their utmost to increase the amount of the invested funds of the Institution. So far as in him lay, he would do his utmost to achieve that object, and he was sure that he might count on the hearty support of all the friends of the Institution.

The toast was received with enthusiasm.

The secretary then read the lists of subscriptions, the total of the chairman's list alone amounting to 1,074*l.* 7*s.* This included 105*l.* given by himself, 105*l.* given by Mr. Godwin, and 827*l.* given in ten guinea donations, about 630*l.* being given in response to Mr. Godwin's offer to give 100 guineas provided twenty donors of ten guineas each could be found. The grand total of subscriptions and donations announced was 1,436*l.* 7*s.* 6*d.*, a sum not equalled on the occasion of any previous anniversary of the Institution.

Mr. F. J. Dove, in proposing "The Chairman," said that among the many services which Mr. Plucknett, their valued treasurer, had rendered to the Institution, not the least was his successful persuasion of Mr. Burt to become the President of the Institution. Mr. Burt had eloquently advocated the claims of the charity, and his zeal in its cause was shown by the magnificent list of subscriptions. It was not the first time that Mr. Burt had assisted them on the like occasion. A few years ago, when he was occupying the exalted position of Sheriff of London, he very kindly came to their assistance. His presidency would be memorable in the annals of the Institution.

The Chairman, in responding, said he thanked Mr. Dove for the flattering terms in which he had mentioned his name, and the company for the way in which they had received the toast; but he had to thank them for something still better, viz., for the warm response which he had met with in reference to his appeal in connexion with Mr. Godwin's kind offer. Mr. Godwin had started the ball towards a good subscription, and he (the chairman) had done his best to keep the ball rolling, and he had been nobly assisted in that work by many of the gentlemen whom he saw around him.

Mr. Barfield proposed "The Vice-Presidents and Trustees," coupled with the name of Mr. T. F. Rider, who, in responding, said he had to speak in the name of 150 gentleman, many of whom had done good service to the Institution, while many others were still doing it, or hoped to do it, good service.

The Chairman, in proposing the health of the Treasurer of the Institution, Mr. George Plucknett, J.P., said that gentleman had been associated with the charity from its very foundation, and everybody knew the great services which he had rendered it.

Mr. Plucknett, in responding, expressed his gratitude for the handsome way in which the Institution had been supported on that occasion, for by the help of the liberal donations and subscriptions which had been announced the committee would be able to carry on the work of the Institution without anxiety during the coming year. When, a year or two ago, the friends of the Institution were pleased to say that the stipends of the pensioners should be increased, so that they might have a sufficient income from the Institution without seeking the aid of other charities, the committee felt that they had undertaken a great responsibility by so large an increase of annual expenditure as was involved by the change, and they felt that if the change was to be a permanent one it would be necessary to largely increase the amount of subscriptions and donations. Hardly had that change been entered upon, however, when, thanks to the energy of Mr. Rider, the President of the Institution last year, increased subscriptions and donations flowed in, so that the committee were able not only to pay the increased amounts of the pensions, but to elect three additional pensioners. Before he resumed his seat he should like to say a few words more than had been said with reference to Mr. George Godwin's generous help. He did not believe that there was any man living who had rendered such powerful aid to the Institution as Mr. Godwin. In years gone by, when its founders were struggling to put the Institution on a permanent basis, Mr. Godwin rendered them every possible service by advocating the cause of the charity in the press. They used to look, as their annual meetings came round, to learn what Mr. Godwin had to say about them, and he never failed them in coming to their aid with words of encouragement, and with the powerful advocacy of the journal with which he was connected. The *Builder* had ever been foremost in aiding the Institution. When Mr. Godwin heard of the proposed increase in the amount of the pensions he did not allow many hours to pass before he wrote offering to give a donation of 100 guineas to the Institution provided twenty other friends would give donations of ten guineas each. The result had been, thanks to the energy of the President, that instead of there being twenty responses to the offer, there had been sixty. As treasurer of the Institution he (Mr. Plucknett) could not sufficiently express his sense of indebtedness to the friends of the Institution for the magnificent subscription list which had been announced.

The Chairman, in proposing "The Architects and Surveyors," said that the builders owed much to the gentlemen of both professions. It was perfectly true that they (the builders) often found themselves completely in the hands of the architects, but, as a rule, those gentlemen performed their duties most properly and fairly. With the toast was coupled the name of Mr. Franklin, who, in responding, said he considered himself by no means an architect, although he did claim to be a surveyor. It was his decided conviction that the two professions were, and should be kept, entirely distinct, and he believed that that was an opinion which would be ratified by all builders.

Mr. Chappell, in proposing "The Committee and Stewards," spoke of the assiduity with which the Committee of the Institution attended to their duties, and coupled with the toast the name of Mr. T. G. Smith, who, in responding, said that as some illustration of the way in which the committee performed their duties, he might mention that when, at the beginning of the year, Mr. Fourdrinier offered to get up a theatrical performance in aid of the funds of the Institution, the committee at once guaranteed all the necessary expenses, and the result was that the entertainment brought in more than 100*l.* to the funds of the Institution. More recently, when the offer which had been referred to came before them, eleven out of the required twenty donations of ten guineas each were promised by members of the committee.

Before leaving the chair, the President announced that he had received several kind letters from friends of the Institution wishing him success on that occasion. One of them was from Mr. W. R. Rogers, of the firm of Cubitt & Co., who stated that when he was President of the Institution some years ago, his firm offered 100 guineas to its funds provided nine other firms would give the like amount each. Now, Mr. Chappell had consented to be the President of the Institution next year, and if that gentleman could find nine firms who would give 900 guineas collectively, his (the Chairman's) firm would give the tenth hundred guineas.

Mr. Chappell said he accepted that challenge with pleasure, and would do his utmost to be able to claim the fulfilment of the President's promise. Personally, he might say that he should not be backward in doing his part.

Surveyor, &c., Loughborough.—A meeting of the Loughborough Local Board was held on the 3rd inst. to appoint a surveyor and waterworks manager. Out of 136 applications, reduced first to twenty-one and then to six, three had been invited to attend, viz., 1, Mr. Frank Baker, Assoc. M. Inst. C.E., Waterworks Office, Sheffield; 2, Mr. William Matthews, Assistant Borough Surveyor, Peterborough; 3, Mr. Alfred B. Brady, Surveyor to the Dockwell Union and Hunstanton Local Board. Eventually Mr. Baker was appointed. The salary is 200*l.* a year.

RE TEWKESBURY ABBEY.

A LETTER from the Secretary of the Society for the Protection of Ancient Buildings, published in the *Times* in the course of last week, calls attention to a subject of complaint in regard to which we can concur with the Society. This is in reference to a reported intention on the part of the Restoration Committee to take out the large west window of Tewkesbury Abbey, to replace it, we presume, with a modern building up of what it is supposed may have been there in the Norman period of the abbey. If it is true that there is such an intention, we say, without hesitation, that it is a foolish and unjustifiable scheme. It may be the more advisable that we should add an opinion, as we can at least give a moderate and reasonable one, without the exaggerated statements with which, as usual, the Society's agents do much to discredit their own recommendations and to prevent many reasonable people from accepting their authority. The Secretary states in his note prefacing the communication, that this is an ancient fabric which has "already received irremediable damage at the hands of the restorer." This may be regarded as true by those who think it is doing "irremediable damage" to a church to scrape the whitewash off the walls and repair the interior stonework. At the time when the interior work was half finished, we drew attention to the contrast of effect between the still white-washed state and forlorn appearance of the nave, and the way in which the cleaning and repair had brought out the effect of the choir and transepts, and advised any one who was affected by the fulminations of the Society against repairing and cleaning a building to look on this picture and on that,—on the unrestored nave and the restored choir,—and say which state best represented the true architectural effect of the building. The painting and gilding of the bosses of the vault were coarse and tawdry in effect, but that is not "irremediable." Subjoined to the Secretary's letter above referred to was a long statement from "a competent member" of the Society as to the west window and its history. It would have been better to have stated who the member was, and we could then have formed our own opinion as to his competency. He gives a description of the window, not forgetting the inscriptions on the two tablets inside, giving the names of the clergy and churchwardens, and the builder, under whose reign the window was put in, at the date, as stated on one of the tablets, of 1686. The "competent member" does not believe that this is the date of the window, but of its repair, and asserts that it is "a fine and interesting window" with the stonework in a perfect state of repair, and that, "the design of this window being a very good one, and its state of preservation quite perfect, there cannot be even the shadow of excuse for destroying it."

Whether the "competent member" is only biassed by the usual determination of the Society to find everything to be of remarkable interest which it is proposed to pull down, or whether he is merely unacquainted with the characteristics of really "fine" late Gothic work, we cannot say, of course. We believe the date of 1686 may be open to question as the real date of the window, but there is nothing to make such a date impossible. The window is a weakly-designed specimen of the decadence of Gothic architecture, with thin and badly-designed tracery, and such as in "the books" used to be generally classed as "Debased Gothic," and it is quite possible that such a window might have been put in, as an expiring effort of Gothic, as late as the date inscribed. No one who knew what fine Perpendicular work was would think of calling it a fine window, and any one who went out of the way to look at it in consequence of being told so, would consider that he had been taken in. We consider it necessary to state this, because we are not going to implicate ourselves in the ideas of the "competent member" in regard to Gothic architecture, and we wish to take every opportunity of warning the public against accepting exaggerated statements. But in spite of this, we entirely concur in the opinion that to take out the window would be an act of sheer folly. It is in a way "interesting" historically, as showing what sort of Gothic was put in by churchwardens towards the close of the seventeenth century. In spite of its bad detail, it looks fairly well at a little distance. It has been associated for nearly two centuries with the grand west end of the building, and has become assimilated by time with the tone of the rest of the exterior; and, above all, if the Restoration Committee take it out, what are they going to put in its place? Modern Norman, we presume, to "match" the large arch. Well, the present window, poor as it is intrinsically, is at least worth far more than any sham Norman can be. It represents part of the latter history of the church, and has a continuity architecturally with what preceded it, representing one of the latest attempts of a decaying or decayed style. To remove it for the sake of putting up modern imitation work in its place would be an absurdity, and we strongly protest against it, without thinking it necessary on that account to exaggerate the architectural beauty of the window. Nothing is to be gained by doing that, except impairing the force of the recommendation to let it remain. But it is an old feature which has grown into its place, and, at all events, nothing that is likely to be put in instead of it will equal it in interest. We hope the Restoration Committee will have the sense to let well alone.

OXFORD UNIVERSITY.

NEW BUILDINGS, ADDITIONS, AND ALTERATIONS.

THE building operations in connexion with the University of Oxford during the last twelve months have been less numerous and extensive than in past years, but the following summary, abridged from the *Oxford Times*, refers to some very important and interesting works:—

The New Examination Schools.—Since October 1880 considerable progress has been made towards the completion of this pile. The hoarding having been removed from the High-street front, the façade may now be seen in its entirety. The architect is Mr. T. G. Jackson; the builder is Mr. Estcourt, of Gloucester; and the carving is by Messrs. Farmer & Brindley, of London. The building throughout will be warmed and ventilated by the hot-water apparatus of Messrs. Haden & Son, of London and Trowbridge, under the superintendence of Mr. John Rogers. The same firm have also constructed a similar apparatus in the new High School for boys.

The New Wing at Magdalen.—A new quadrangle is in course of formation on the space between the existing front and Magdalen School. The foundations have been excavated and laid in, and the walls have at present reached a height of nearly 5 ft., the jambs of the windows and the various doorways being in position. Eventually it is intended to construct three sides of a square, the fourth side being occupied by structures already standing, but at present only half of the original design is in hand. This portion includes the whole of the frontage facing south, in a line with the school and Magdalen Bridge, and half of the west wing, to be erected at right angles to it. This part of the building will include thirty "sets," besides lecture-rooms and Fellows' chambers. The front elevation is Late Perpendicular in style, in order to harmonise with the front adjoining. At the south angle of the new façade will be erected a tower harmonising with that of the founder in the centre of the west side of the cloisters, which will rise to some 80 ft. At the base of this tower the chief entrance to the new quadrangle will be constructed, the archway and groining of the roof being in harmony with those in the founder's tower; and above, on the first and second stories, oriel windows. The front extends about 200 ft. from east to west, and the west wing will extend about 114 ft. northwards. At either extremity the oriels will extend to the second story, and in the west wing those facing the interior of the quadrangle will be of similar design. The architects are Messrs. G. F. Bodley and T. Garner, of London. The contract for the portion of the work at present in hand has been let to Messrs. Franklin & Son, builders, Deddington; and the clerk of the works is Mr. G. Fitzwilliam.

Somerville Hall.—A large addition, nearly or quite equal in size to the original building, is being made to this institution, situate in St. Giles's-road West. The extension consists of a new wing at the south-east corner of the old building, with which it will be connected by a corridor, and the foundations are now being laid. The new structure, which will be of Handborough stone and red brick, with red tiled roof, will be 56 ft. by 24 ft., and three stories in height. On each floor a corridor will extend the whole length of the north side of the building, and will give access to four sets of rooms. The building will thus give accommodation for twelve additional students. Mr. T. G. Jackson, of London, is the architect, and the builder is Mr. Selby, of Oxford.

The Reredos in the Cathedral.—This work, which was finished last Term, has attracted many visitors. It consists of a centre panel and two flying arches, in each of which is an accessory figure, flanked by side panels, each containing two statuettes. The centre piece represents the Crucifixion. The style of architecture employed is ornate Perpendicular, with rich adjuncts. The dull red of the stone is relieved by the golden background, and the ornaments picked out with green and gold on either side of the groined canopy. The structure itself is in Dumfries red sandstone, and the figures are in Cipolino marble. The canopies over all three panels are rich and effective, and the embossing perfect in its character. Over the side canopies are embossed shields, bearing figures connected with the crucifixion. Richly-embroidered wings, in green and gold tapestry, by Watson & Co., of London, are hung at either extremity on gilt rods, while the super-altar is covered with similar materials. The architects of the reredos are Messrs. Bodley & Garner, and the clerk of the works was Mr. G. Fitzwilliam. It may be stated that the cathedral authorities intend to erect a marble font in the south transept.

St. John's College.—Part of the new scheme for the extension of this college is now nearly completed. The entire plan embraces the construction of a new quadrangle and dining-hall to the north of the existing buildings, with a frontage to St. Giles's-street of 152 ft., a north wing extending 164 ft., and an east wing 156 ft. The new hall will be 88 ft. by 44 ft. Three old houses on the south side have recently been demolished for a fresh addition on that side, but neither the plans nor arrangements for this part of the improvements have been completed. The portion of the new quadrangle which is almost finished, consists of a residence for a porter on the south side of the entrance gateway, Fellows' rooms over the entrance, and twelve suites for undergraduates. The noticeable feature is the gateway, which forms the basement of the tower, and the tower itself. Over the archway is a decorated niche with canopy, which is destined to receive a statue of St. John the Baptist, in whose honour the college was founded. The oriel windows above are simple, but effective. The tower is 66 ft. high, and finished off with an embattled coping. The new entrance-gateway is low-pitched and stone-groined, with ornamental panels. At the junction of the groinings are the arms of the architect, Mr. Geo. Gilbert Scott, F.S.A., and of the University, and Herodias bearing the head of the Baptist, the escutcheon of the college. The pitch of the roof of this wing is 46 ft. from the ground, and the subordinate features of the frontage are elaborately executed gargoyles with grotesques carved on the weather courses. Throughout this portion the spandrels of the doorways are ornamented and carved. The chambers are spacious and well-lighted, a speciality having been introduced in the grates so as to provide either hot air or ventilation, as may be requisite. The walls of the building are of brick, faced with Taynton stone, supplied from the quarries of Messrs. Groves & Pittaway. The sills, weather-courses, &c., are in Clipsham stone, supplied by Mr. Medwell. The roofing is of Colley Weston slating, supplied and laid by Mr. W. Close. Messrs. Boyd, of Maddox-street, London, have been entrusted to fix the grates and tiles, and Messrs. Burt & Potts supply the casements. The staircases of the building are in solid oak with ornamented balustrades, the floor-joists and roof-joisting of fir. Messrs. J. R. Symm & Co., of Oxford, are the builders, and the completed contract was let for over 9,000*l.*, but this forms but a fraction of the estimated cost of the new quadrangle when complete. Mr. Thos. Burton is clerk of the works.

Brasenose College.—One of the most extensive collegiate alterations that have been recently undertaken is the new quadrangle. It is intended to construct a pile of buildings extending from the library to High-street. At present, however, only part of the scheme is to be completed. The portion at present in course of construction is to occupy the area of what used to be known as "Amsterdam." The space available by the demolition of old cottages is about 170 ft. by 80 ft., and the building to be erected will measure about 150 ft. from north to south, and about 46 ft. from east to west. The buildings will include basement, ground, first, and second

floors. There will be accommodation for about thirty students, and the plan includes two large lecture-rooms, besides laundresses' offices, conveniences for scouts, &c. At present the workmen are engaged digging the foundations, and, in order to get a reliable hold, excavations averaging 20 ft. in depth have been made. A solid bed of concrete, 6 ft. thick, will be laid in, over which there will be a solid stone bed very nearly to the present ground level. Mr. J. G. Jackson is the architect. The clerk of the works is Mr. Thomas Mockford.

Lincoln College.—A new wing is being added to this college in what is known as "the Grove." The site extends from the dining-hall eastward to the back of Brasenose College, and at right angles, northward, to Brasenose-lane, the area being 90 ft. by 30 ft. The foundations are already in, and when the new buildings are complete there will be accommodation for sixteen students. The new buildings stand on the site of an old block in which there were ten sets, and will consist of three stories and basement, with the usual offices. The architect is Mr. T. G. Jackson.

NEW FIRE BRIGADE STATIONS.

Several new station buildings for the use of the Metropolitan Fire Brigade are now in course of erection, or are about to be commenced. The report of the Fire Brigade Committee, submitted to the meeting of the Metropolitan Board of Works on the 1st inst., notified the receipt of a report from the Superintending Architect of the Board (Mr. Vulliamy), stating that Mr. Mott, the officer in his department who had the superintendence of the Fire Brigade buildings, was in a weak state of health, and that a medical certificate had been produced to the effect that he required a few months' leave of absence to enable him to recover his health. The Committee were able to say from their own experience that Mr. Mott was an excellent officer, and that his services were valuable to the Board. They recommended that two months' leave of absence be granted to him, and they hoped that at the end of that time he would be able to return to his duties in improved health. During Mr. Mott's absence, his place would be filled by Mr. R. Pearsall, who, although only employed temporarily, and in receipt of 3*l.* 13s. 6d. a week, was stated by the Architect to be a thoroughly competent man. The Architect had also reported to the Committee with respect to the work in hand and in prospect connected with the Fire Brigade buildings, and from his report it appeared that it would be necessary to employ more persons on the work to enable it to be proceeded with more quickly. There were three stations in course of erection,—at Shadwell, Theobald's-road, and Lower Norwood. The new station which the Board had ordered to be erected in Scotland-yard, and the drawings of which were now nearly completed, would, it was hoped, be begun at the end of this year or the beginning of the next; and the drawings of the additional buildings at head quarters were about to be proceeded with. There were also in hand the drawings of the proposed additions to the Holloway Station. The Board had, moreover, ordered the erection of two new stations, on ground already purchased for the purpose, one at Kentish-town and the other in the northern part of the parish of Kensington, and it was desirable that these should be proceeded with as early as possible. In addition to these works, there was in prospect the erection of new stations in Bishopsgate, Bethnal-green, Stoke Newington, Camden-town, Regent-street, and Baker-street, all of these being required, though some of them sooner than others. Then, again, additions and alterations were required at many of the existing stations to make them adequate to the increased necessities of the Brigade; and at all the stations repairs were called for from time to time to keep them in good condition. It would thus be seen that a considerable staff was required to deal with the large quantity of work which the erection and maintenance of the Fire Brigade buildings involved; and the number of persons now employed was really insufficient for the purpose. There were six, altogether: Mr. Mott, who arranged and superintended the whole; Mr. Pearsall, a competent architectural designer, of whom, as stated, the Architect speaks highly; Mr. Nixon, who assisted Mr. Mott in the survey and superintendence of the alterations, repairs, and general works, and whose assistance was stated to be most valuable, his salary being 4*l.* 4s. a week; Mr. Estall, clerk of works, at 4*l.* 4s. a week; Mr. Brakspear, a draughtsman, at 2*l.* 10s. a week; and Mr. Hart, a junior assistant for general purposes, at 1*l.* 10s. a week. Quite apart, therefore, from Mr. Mott's approaching temporary absence, it was requisite that more persons should be employed on the Fire Brigade work; and after full consideration, the committee felt compelled to ask the Board to authorise them to employ temporarily, and not in an established capacity, an additional clerk of works at 3*l.* a week, and two additional draughtsmen at 2*l.* 10s. a week each, their engagements to be determinable by a week's notice.

The report was adopted.

THE TOWN-HALL AT ECCLES, NEAR MANCHESTER.

The new town-hall which has recently been erected for the Local Board district of Eccles, Barton, and Patricroft, at Eccles (the seat of the manufacture of the famous Eccles cakes), near Manchester, was opened on Friday evening last (Nov. 4), by Mr. J. T. Hibbert, M.P., the Parliamentary secretary to the Local Government Board. The building, which occupies a commanding position in the main thoroughfare, Church-street, is in the Italian style of architecture; the exterior elevation is of stock bricks with stone dressings, and is surmounted by an ornamental clock-tower. Perhaps the most imposing feature in connexion with the hall is the large assembly-room, which is on the first floor, and is about 90 ft. by 40 ft., and capable of seating 1,000 people; there are also a fine orchestral platform and three ante-rooms, the room being intended to be used for public meetings, balls, and other gatherings.

On the ground-floor at the front are the board-room and general "rate, &c.," offices, and on either side of a long encaustic-tiled corridor are the offices of the surveyor, the sanitary inspector, the members' ante or retiring rooms, clerks' offices, and several other rooms. There are ten rooms in the basement, where there is a cooking-kitchen amply provided with the requisite cooking-apparatus, "Leamington ranges," &c., and living-apartments for the hall-keeper, storage-rooms, &c.

It was originally intended that the tower should be composed of wood, but Mr. Robert Hall, a member of the Board, offered to supply the tower with a clock if it were built of stone, which was accordingly done, and the result is, thanks to Mr. Hall's generosity, a very fine clock with bells, which strike the hours and chime the quarters. The total cost of the building has been about 4,600*l.*, in addition to which about 500*l.* has been expended in furnishing and fitting the interior. The architect was Mr. John Lowe, F.R.I.B.A., of Mansfield-chambers, St. Ann's-square, Manchester, and the builders were Messrs. T. Moore & Sons, of Eccles.

ST. PETER'S CHURCH, VERE-STREET, OXFORD-STREET.

This church, of which the Rev. Wm. Page-Roberts, M.A., is the present incumbent, has been closed for about three months, during which time it has been painted and decorated and reseated in oak, with new carved oak pulpit, lectern, &c., and was re-opened on Sunday, November 6th. The whole has been designed by, and the work carried out under the superintendence of, Mr. James K. Colling, architect. The execution of the oak work and carving was entrusted to Messrs. Cornish & Gaymer, of North Walsham, Norfolk; the decoration to Messrs. J. & J. King, of Norwich; and the glazing of the side windows to Messrs. Pepper & Co., of the Euston-road.

The east window has been filled in with stained glass designed by Mr. Burne Jones, and executed by Messrs. Morris & Co.

The organ has been removed from the west-end gallery and placed in the north-east angle of the church. This has been done, and considerable improvements have been made in the organ, by Messrs. Hill & Son, organ-builders. The church has been lighted by two sun-lights, which were put up by Messrs. Strode & Co.

The church externally is a plain brick structure, of very unpretending appearance, but internally it is divided into nave and aisles, having an enriched plaster ceiling, supported on Corinthian columns. The architect of the building was James Gibbs, the architect of St. Martin's-in-the-Fields, to which church St. Peter's bears a considerable resemblance, although upon a smaller scale.

The carving has been specially designed by the architect, with natural foliage conventionalised to accord with the character and style of the building. In doing so, the type of work which has been followed in a great measure has been the oak carving of Grinling Gibbons. It should be understood that Grinling Gibbons carved in two styles,—one out of the solid oak in low relief, much of which was very beautiful and delicate in style, as may be seen in the stall-work of St. Paul's Cathedral; the other was carved in lime-tree, and fixed upon an oak ground, executed with most extreme relief, as seen in the panels above the stalls of St. Paul's, and in the reredos of St. James's Church, Piccadilly. To obtain this latter character no attempt has been made in the carving designed by Mr. Colling for St. Peter's Church, but all has been scrupulously carved out of the solid oak.

The total cost of the additions, alterations, and decoration has been about 2,000*l.* The result appears to us very satisfactory.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

The annual meeting of this Association, for the opening of session 1881-1882, was held on Tuesday evening last, the 8th inst., in the Library at Queen's College.

The President, Mr. Jethro A. Cossins, occupied the chair, and there was a good attendance of members and visitors, including Messrs. J. G. Bland, H. F. Talbot, G. F. Hawkes, R. B. Morgan, J. L. Ball, J. P. Osborne, W. Henman, T. Jones, W. Wallis, J. William Tonks, W. H. Kendrick (of West Bromwich), H. H. McConnal, and F. E. F. Bailey (of Walsall), Fred. G. Hughes (honorary secretary), &c.

The annual report and the balance-sheet were read and approved.

The President then delivered an address, in which he dwelt chiefly on the subject of street-architecture. At the conclusion, a hearty vote of thanks was accorded to Mr. Cossins for his excellent address on the motion of Mr. McConnal. Messrs. Morgan, Tonks, and Henman spoke in support of the motion, and, after the President had replied, the meeting terminated.

EXETER ON THE "FIFTH."

The fiery festival was kept up at the "Ever Faithful" city with all the usual honours. At seven p.m. the annual procession started from the head of St. Sidwell's, preceded by bands of music. It consisted of several hundred citizens dressed in quaint costumes and armed with blazing torches. The scene, as the train proceeded down the venerable High-street, was wondrously picturesque. Not only was the thoroughfare thronged, but every open window above was filled with smiling and cheering faces. Coloured fires burnt at intervals illuminated the old gabled buildings and threw a weird light upon the proceedings. On passing the ancient Guildhall, the Mayor (Alderman Pring) was loudly cheered by the populace. This annual carnival has been opposed by several preceding mayors, but the present one,—who is a jolly brewer,—has countenanced, rather than otherwise, the traditionary gathering. Upon arriving in the cathedral yard, the bonfire was lighted with much ceremony for the 285th annual time, the brass band the while playing the "National Anthem." This fire is always built upon one spot,—an open space immediately facing the west front of the cathedral, and close by the adjacent church of St. Mary Major. It consisted of 1,200 ash-faggots, ten tons of old railway sleepers, six tons of roots of trees, and thirty tar-barrels. The old cathedral never looks so sublimely grand as it does on these occasions.

Cauer's Witch.—The fine marble statue, called "A Witch," by Carl Cauer, which excited almost as much admiration as any piece of sculpture in the German division at the last Universal Exhibition at Paris, has just been purchased by the Prussian Government. The work will form a permanent ornament of the National Gallery of Berlin.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,609. J. Court, London. Appliances for ventilating, heating, and cooling. Oct. 21, 1881.

4,620. H. T. Dawson, Chiswick. Cistern-valves. Oct. 21, 1881.

4,638. F. H. Smith, London. Ventilation, &c. Oct. 22, 1881.

4,648. H. J. Haddan, Kensington. Tiles. (Com. by A. Vuillaumé, Blanquefort, France). Oct. 24, 1881.

4,656. T. H. Rees, Lambeth. Glass tile borders. Oct. 25, 1881.

4,662. E. P. Alexander, London. Apparatus for heating baths and greenhouses, &c. (Com. by C. Martin, Paris.) Oct. 25, 1881.

4,665. H. J. Haddan, Kensington. Doors and windows. (Com. by Favier-Simonet, Tourcoing, France.) Oct. 25, 1881.

4,692. J. Benson and T. Wainwright, Southport. Apparatus for excluding draughts and dust in doors and windows. Oct. 27, 1881.

4,698. R. Brealey, Westminster. Chimney-caps. Oct. 27, 1881.

4,707. J. H. Miles, Southampton. Window-sashes. Oct. 27, 1881.

4,712. C. Ezard, Bradford. Ash-pans. Oct. 27, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

October 25, 1881.

3,292. A. Sclanders, London. Appliances for fastening doors and instantaneously releasing the same. (Com. by J. P. Black, Nelson, New Zealand.) July 27, 1881.

October 28, 1881.

3,447. W. G. Macvitie, Sutton Coldfield. Attaching door-knobs to their spindles. Aug. 9, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending October 29, 1881.

1,101. M. E. Dearnaly, Mirfield. Bricks.

A T-shaped or dovetailed recess is formed in the brick, and iron binders are used in double walls which correspond to this recess to bind the walls together. March 14th, 1881. Price 1d.

1,184. J. A. Berly, Peckham. Pipe-joints.

A ring, made of an elastic or compressible material, such as indiarubber, lead, &c., is used for the joint. This ring, in section, is of U-shape, and is placed in the joint with the concave part turned towards the pressure of the liquids, fluids, gases, &c. In the female flange of the pipe is hollowed out a cavity in which the ring is placed, and the male flange has a fore part, the end of which presses against the joint ring. Numerous modifications and adaptations for different pipes are shown. (Com. by L. Langlois, Louvain, Belgium.) March 18th, 1881. Price 8d.

1,210. J. Bernard, London. Baths, &c.

The bath is formed of the usual shape, but with a double shell. The space between the two shells serves as an air-heating chamber, so that the bath may be used as a Roman or Turkish bath. The air may be heated by steam or other method. A rotary brush as a shampooer and other fittings of a like nature are also provided. March 19th, 1881. Price 6d.

1,217. W. L. Hunt, Westminster. Apparatus for measuring and registering the flow of liquids.

The tap or cock is fitted with a plug which has a central chamber of a determined size, and two holes in its circumference to open and close the communication. The plug is connected by a toothed segment and ratchet wheel, with an apparatus to register the number of times it is turned. (*Pro. Pro.*) March 19th, 1881. Price 2d.

1,249. P. O'Connor, Wavertree. Taps or cocks.

The taper hollow plug has an aperture leading from the large end to one side, and the barrel has two openings at the sides, one in a line with the side opening of the plug, and the other beneath the wider end of the plug. The plug is held in position by a washer. No leakage, therefore, is allowed. Several modifications are shown. March 22, 1881. Price 6d.

1,252. J. W. Lewis, Halifax. Raising and lowering window-sashes.

On the outer side of each sash is a groove, and in the frame a corresponding groove, with worm-threaded racks, arranged so as to be capable of being moved laterally therein into the opposite groove in the frame or casing. At the back of the grooves in the frame a pair of vertical shafts, each with a worm and pinion, are affixed, together with a horizontal shaft and double-faced bevel wheel, so arranged that this wheel can gear into either of the pinions. By rotating the handles of the horizontal shafts, two of the worms are revolved, and the two corresponding racks becoming geared into these worms, the sash in connexion with them is caused to ascend or descend. In the case of side windows, the handles may be connected by a link. March 22, 1881. Price 6d.

1,290. W. R. Comings, London. Bells, knockers, letter-plates, &c.

The bell is operated by clock mechanism, governed by an escapement. The spring is wound up by a lever connected with the bell-pull, and the reaction causes the bell-hammer to strike upon the bell. The bell-pull is carried through the door and letter-plate. All are placed together in the door. (*Pro. Pro.*) March 23rd, 1881. Price 2d.

1,293. J. Watson, Rotherham. Manufacture of kitchen ranges, &c.

The usual screws for securing the back and side plates together are dispensed with by casting on the edges of the plates hooks, which hold them firmly in position. (*Pro. Pro.*) March 23rd, 1881. Price 2d.

1,309. A. C. Henderson, London. Safety wicket and grating for street-doors.

A grating is let into the door from the inside, which is opened or closed by a second grating secured by a bolt beneath the grating in the aperture for the reception of letters. The lower panel of the door is movable, and turns on hinges for the reception of parcels, &c. The panel is secured by a bar which is formed in the shape of an axe for use if required. (Com. by J. M. A. Montclar, Paris.) March 24, 1881. Price 6d.

1,312. H. Massicks and W. Crooke, Millom. Hot-blast stoves.

An iron vertical cylinder, the top of which is conical and fitted with an air-valve, contains a series of concentric segmental passages, the walls of which are of brickwork. The gases to heat the stove are admitted from below to the centre of the stove, and caused to traverse all the passages alternately upwards and downwards before being carried off by the chimney. The air to be heated passes through in the opposite direction. March 24, 1881. Price 6d.

1,314. G. L. Shorland, Manchester. Ventilating apparatus.

An air-passage is formed from the bottom to the top of the building, and branches are led from each room to this shaft. The vitiated air is withdrawn through a passage in the ceiling, and suitable valves are used to prevent any down-draught. (*Pro. Pro.*) March 24, 1881. Price 2d.

1,338. S. Bee, Grantham. Apparatus for working the rollers of blinds, maps, &c.

A collar-nut is applied to the lower end of a spindle in such a manner that the nut communicates its rotary motion to the spindle, which carries a screw-worm geared into by corresponding appliances on the roller. (*Pro. Pro.*) March 25, 1881. Price 2d.

1,362. A. L. Tomkins, F. M. Courage, and F. A. Cracknall, London. Automatic regulation of heat in kilns.

A coil of mercury is connected with a receptacle covered with india-rubber. As the mercury rises or falls, the india-rubber, acting in connexion therewith, opens or shuts a valve which regulates the heat either by closing the air-channel or cutting off the gas. March 28, 1881. Price 4d.

1,380. W. E. Crowther, Manchester. Ornamental screens for fire-places.

The screen is composed of canes or other flexible reeds, which are arranged in an open ornamental pattern that will not interfere with the ventilation, but the screen at the same time can easily be bent or woven to the desired pattern or configuration. March 29, 1881. Price 2d.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

ARCHITECTS' ACTIONS.

LANGSTON *v.* TRINITY COLLEGE, LONDON.

THIS was an action (Queen's Bench Division) for services rendered as an architect and surveyor. The defendants paid 21*l.* into court, which they said was sufficient to satisfy the plaintiff's claim.

The plaintiff, Mr. Alfred Langston, is an architect and surveyor, residing in Torrington-square, and the defendants are the authorities of Trinity College, London, which was established for the cultivation of church music and other purposes. The case for the plaintiff was that in January, 1876, he was employed by the Rev. Bonavia Hunt, the warden of the college, to prepare designs for the institution, and to look about for an eligible site. He accordingly prepared designs, which were accepted, and a perspective of the exterior of the proposed building was published in the College Calendar. Further, he entered into negotiations for a site, and selected and superintended the alteration and decoration of certain premises in Weymouth-street, which were temporarily occupied by the college. It was for remuneration for these services that the action was brought. The defendants admitted that the plaintiff was entitled to be paid for finding the premises in Weymouth-street and superintending the repairs and decorations there, and for this they paid 21*l.* into court. With respect to the design and the site, they said the plaintiff was employed subject only to his being paid for his services in the event of the design being carried out, and that, in fact, from want of the necessary funds, it was not carried out. It was agreed between the parties that if the plaintiff was entitled to recover under these heads, the sums should be 50*l.* for the design, and 10*l.* for services in connexion with the site, and the liability of the defendants for these sums was the only question in the case.

The jury found that the plaintiff was entitled to 60*l.* beyond the sum paid into court.

Verdict accordingly.

EVANS AND ANOTHER *v.* CARTE.

THIS case, which came before Lords Justices Baggallay and Brett in the Court of Appeal on the 9th inst., raised a question whether, if a plan for a building "goes off," the employer of the architect is liable to the surveyor employed by the architect to take out the quantities on the architect's plans.

The action arose out of the project of Mr. D'Oyley Carte, in 1880, of building the Savoy Theatre, and was tried before Mr. Justice Bowen and a common jury. The question left to the jury was whether Mr. Emden, the architect from whose drawings the quantities were taken, was acting under the authority of the defendant in giving instructions to the plaintiffs to reduce the quantities, which they had previously prepared, in order to get a reduced tender. The jury found that he was, and gave a verdict for the plaintiffs. A Divisional Court, consisting of three Judges, having discharged a rule *nisi* for a new trial, on the ground that the verdict was against the weight of evidence, the defendant appealed to this Court.

Their Lordships, without calling on the counsel for the plaintiffs, refused to interfere, and dismissed the appeal.

COMPENSATION CASES.

THE CORPORATION OF THE TRINITY HOUSE *v.* THE METROPOLITAN AND DISTRICT RAILWAY COMPANIES.

THIS was one of several heavy compensation cases arising out of the works lately taken in hand for the completion of the "Inner Circle" Railway. The case was tried on Saturday last before Mr. Under-Sheriff Burchell and a special jury.

The property in question is situate on the east side of Trinity-square, Tower-hill, and consists of several houses of which the claimants were the owners. Sir John Holker and Mr. Vaughan Williams appeared for the plaintiffs, and Mr. R. E. Webster, Q.C., and Mr. Graham, for the defendants.

Mr. T. Horsey (of the firm of Fuller, Horsey, Sons, & Co.), called by the counsel for the claimants, stated that the property consisted of 33, 34, 36, and 38, Trinity-square, No. 33 had a frontage of 16 ft. and an area of 993 ft., and was let on a lease at 90*l.* a year, expiring at Midsummer, 1894. He estimated it to be worth 150*l.* a year. He capitalised the rental on the 5 per cent. tables, making 2,430*l.* Nos. 34 and 36, on the opposite side of the mews, were houses with gardens; and as gardens were an anachronism in the City of London, he would let the sites as building land, and take 200 ft. from the roadway, which was wider than necessary. This would give 4,515 ft., but on 900 ft. buildings of only a ground-floor could be erected, as there were ancient lights to be preserved. He valued the 900 ft. at 1*s.* a foot, and 1,365 ft. at 2*s.* a foot. It was a very valuable site, easily accessible, and well lighted, and he capitalised it at twenty-four years and a half's purchase. He proposed to erect a warehouse containing 18,070 ft. of floor space, the rental value of which, at 1*s.* a foot, would be 900*l.* a year. The cost of the buildings would be, at 6*d.* a foot cube, 6,274*l.*, so that after paying 410*l.* a year ground-rent, the builder would still get 8 per cent. on his outlay. His valuation for these premises was 9,800*l.* No. 38 was a very substantial fine building, built by Cubitt in his best style, and occupied by Messrs. Morgan Brothers, wine merchants and shippers, and used to be the old Oporto House. It had an area of 2,293 ft., and was let on lease for 21 years, expiring at Christmas, 1884, at 150*l.* a year. This had also formerly a garden at the back, but it had been utilised for buildings and cellars by Messrs. Morgan, who had spent a considerable sum of money on the premises. At the expiration of the 3¾ years of the lease, the rental would be at least 300*l.* a year. He capitalised both rent and reversion on the 5 per cent. table, making 5,513*l.* The value of the easement of the road-way had to be calculated on the "rule of thumb." It contained 4,250 ft., which at 2*l.* a foot would be 8,500*l.* for the freehold; but as it was only an easement he put it at 1,000*l.* These four items together made 15,742*l.*, and he added 10 per cent. for compulsory sale, making 21,816*l.*

Mr. E. I'Anson, who was called as a witness on the same side, estimated the total value of the property at 19,897*l.*, or, with 10 per cent. for forced sale, 21,886*l.*

Mr. T. Chatfeild Clarke was also called for the claimants, and gave it as his opinion that the full value of the property, including 10 per cent. for forced sale, was 20,323*l.*

For the railway company, Mr. Alderman Ellis (now the Lord Mayor) was called. According to his view, the full value of the property was 11,823*l.*, which, with 10 per cent. for forced sale, amounted to 13,007*l.*

Mr. E. N. Clifton said the value of the property was 11,859*l.*, which, with 10 per cent. added, was 13,044*l.*

Mr. Edmund Farmer's total valuation was 13,266*l.*, being 13,060*l.* plus 10 per cent.

Mr. George Low valued the property at 11,755*l.*, or 12,930*l.* with the 10 per cent. added.

The jury gave a verdict for 14,659*l.*, including 500*l.* for the easement.

PUGH'S TRUSTEES *v.* THE METROPOLITAN AND METROPOLITAN DISTRICT RAILWAY COMPANIES.

THIS was a claim, in the Lord Mayor's Court, before the Recorder, Sir Thomas Chambers, Q.C., and a special jury, by Messrs. Edward Stuart Pugh and Charles Needs Wellon, trustees of the late Edward Pugh, against the defendant companies for compensation in respect of certain freehold property,—71, Great Tower-street, in the occupation of Mr. Godsell, wine merchant,—required by them under the compulsory powers of the Metropolitan and Metropolitan District Railways (City Lines and Extensions) Act, 1879.

Mr. Edward Clarke, Q.C., and Mr. Pollock were

counsel for the claimants; Mr. Bidder, Q.C., and another learned gentleman for the defendant companies.

The area of the land was agreed on both sides at 1,023 superficial feet.

In support of the claim, Mr. Bousfield (Messrs. Fox & Bousfield), Mr. Pryce (Messrs. Ellis & Co.), Mr. Buckland, and Mr. Vigers, surveyors, estimated the gross value, including a reversion under the will, to be about 13,000*l.*

On the part of the defendant companies, Mr. Alderman Ellis, Mr. Farmer (Debenham, Tewson, & Farmer), Mr. Whichcord, and Mr. Lowe, considered that something under 8,000*l.* was sufficient to satisfy the claimants.

The jury ultimately found a verdict for the claimants—Damages, 8,463*l.*

In the case of Middleton's Trustees against the same Company, and tried in the same Court, the property consisted of four houses in Seething-lane, five in Barking-lane, and three houses and a warehouse in Black Raven-court, City. Mr. M'Intyre, Q.C., M.P., and Mr. Gainsford Bruce were counsel for the claimants; Mr. Bidder, Q.C., and Mr. H. Sutton appeared for the Railway Companies. The valuations on behalf of the claimants were —Mr. C. Reilly, surveyor to the Drapers' Company, 36,828*l.*; Mr. E. l'Anson, Laurence Pountney-hill, 36,390*l.*; Mr. F. W. Porter, surveyor to the Clothworkers' Company, 34,683*l.*; Mr. E. Pryce (Ellis & Sons, auctioneers, Fenchurch-street), 36,828*l.*; and Mr. E. Fox (Fox & Bousfield, auctioneers), 33,325*l.* On behalf of the Railway Company the following estimates were given: —Mr. Alderman Ellis (Farebrother, Ellis, Clark, & Co., auctioneers), 17,050*l.*; Mr. J. Whichcord, architect and valuer, 16,955*l.*; Mr. Edmund Farmer (Debenham, Tewson, Farmer, & Bridgwater, auctioneers), 17,050*l.*; and Mr. E. N. Clifton, architect and surveyor, 16,057*l.*

The jury, after a brief deliberation, found a verdict for 23,143*l.*

DIAMONDS.

Sir,—I notice in the *Builder* of October 29th a statement as to the value of diamonds. Permit me to point out that the most valuable diamonds are not those which are entirely colourless, but those known to merchants as "blue-white." Of blue diamonds, the finest known is the "Hope," valued at 30,000*l.*, and which formed part of the collection of the late Henry Thomas Hope, esq., of Deepdene, and not Mr. Beresford Hope, as stated. This stone is in colour of a beautiful sapphire blue, and there are only three or four other diamonds known in Europe which can really be termed "blue."

The only known specimen of a *red* diamond is now in the hands of a great connoisseur residing in London. It weighs about three grains, and is valued at 800*l.*

The finest green diamond,—a pure emerald green,—is now the property of a West End merchant. It weighs about four grains. There is no other stone known at all approaching this for depth of colour. It is valued at 1,000*l.*

Diamonds that contain a slight tinge of colour are numerous, but have no special value.

Edwin W. Streeter.

*** We print Mr. Streeter's opinion, but against it we must set that of the learned authors of the book *dpropos* of which our remarks were made, who, in classifying diamonds, say, "*Diamants incolores*, très limpides, de la plus belle eau; ce sont les plus estimés, ceux qui donnent les pierres de haut prix."

IMPROVEMENT IN THE FIRING OF KILNS.

Sir,—Having read your article under the above heading, on page 541, I shall be obliged if you will allow me to point out, with reference to your remark, "In the best type of coal-fired brick-kiln hitherto constructed, a firing takes from forty-eight to sixty hours," that there is in use at the Harranden Brick and Tile Company's Hill Top Works, Harranden, a Cramp's patent brick-kiln, which consists of a series of six chambers, each capable of holding 10,000 bricks, and which is worked on the same principle as described by you. That is to say, as regards the utilisation of the heat, each chamber, containing 10,000 bricks, is burned in twelve hours, with a saving of 75 per cent. of fuel. These facts may be of interest to some of your readers.

For the Harranden Brick and Tile Co.,
Samuel Abbott.

The Fish Markets Question was revived at the meeting of the Metropolitan Board of Works on the 4th inst., when, by a much more decisive majority than at the previous meeting, the members voted against applying at present for Parliamentary powers to deal with the subject. On the previous day the Court of Common Council decided by a large majority to experimentally use the new Fruit and Vegetable Market (now nearly completed) as a market for railway-borne fish, subject to the sanction of Parliament.

WEST-END IMPROVEMENTS.

Sir,—I beg to offer for publication a suggestion as to West-end street improvements, which, both for convenience and ornament, is, I think, superior to the plan contemplated by the Metropolitan Board of Works, and which would probably not be more expensive. I propose to form a square between Regent-street, Great Windmill-street, and Piccadilly, and to continue the "Quadrant" from Windmill-street to the junction of Princes-street and King-street. I also propose to widen King-street, Crown-street, and Dudley-street, and remove the block of buildings at the junction of these streets. I would further propose to widen Wardour-street to the same width as Berners-street.

C. Roberts.

TESTING TRAPS.

Sir,—You will, of course, be cognisant that recently not a little discussion has taken place as to the value of the various closet traps, and that there are certain of them that I have advocated; also, that in furtherance of my ideas I have attended various experiments with a view of testing the actual value of each individual trap.

The result of these experiments I have duly reported, and as accurately as possible, but as some members of the trade seem to doubt (not improbably from some reason of their own) the accuracy of my reports, I beg now to inform them that on Saturday, November 19th, at three p.m., a committee of practical plumbers have arranged to meet and finally test the various traps. [See advertisement.] Any interested members of the trade can attend, and I trust that you will ventilate the matter as much as possible.

P. J. Davies.

Books.

The Imperial Dictionary of the English Language. By John Ogilvie, LL.D. New edition, greatly augmented. Edited by Charles Annandale, M.A. London: Blackie & Son. 1882.

The first volume just now issued of this new edition of a well-tried work is very satisfactory. The edition has been in preparation for above ten years, and may justly claim to be considered as substantially a new work. The augmentation which the vocabulary has undergone is so considerable that it will contain 130,000 separate entries.

As a literary dictionary it supplies a key to the written works in the language, by registering and explaining the various meanings which are or have been attached to words by writers both new and old.

The encyclopedic character of this dictionary adds greatly to its real usefulness as a book of reference, and, in conjunction with the numerous interesting quotations it contains, relieves it of the imputation common to dictionaries of being unattractive reading. In fact, it is nothing more than truth to say that, wherever it may be opened, the Imperial Dictionary presents something to interest and instruct,—some useful fact stated in concise terms,—some important maxim or sentiment in religion, morality, law, or civil policy; so that the charge usually preferred against English dictionaries, namely, that they furnish but dry sort of reading, will not apply to this dictionary.

The architectural terms, in common with others, are well illustrated. The work when completed will include 3,000 well-executed little woodcuts.

VARIORUM.

We have received a packet of serials from Messrs. Cassell, Petter, Galpin, & Co., all very good and cheap of their kind. The November number of the *Quiver* is the first of a new volume, and contains the commencement of a serial story, "Into a Larger Room," which begins very well. The *Quiver* is specially intended as a magazine for Sundays.——The *Family Magazine* is one of the best of its class at 7d., and may be safely recommended.——A popular issue, in one shilling parts, of "Picturesque Europe" has been commenced by the original publishers. It is a delightful work, and from first to last the same degree of excellence in the illustrations, on steel and wood, was maintained. The new issue will increase its popularity.——"Picturesque America," on the same lines, has reached its eighth number, and is richly illustrated.——"Cassell's Illustrated Almanac, 1882," for 6d., is a marvel of cheapness. The illustrations are excellent and numerous. —— "Gleanings from Popular Authors" will make an excellent half-hour book, and affords good subjects for readings. ——"Snow Time and Glow Time" is the title of "The Little Folks' Annual for 1882." It has plenty of good illustrations, and the letterpress is well calculated to please young people.—— The "Practical Dictionary of Mechanics," and "Cassell's Popular Educator," a revised edition, come also from the same enterprising firm.—— Never had the theatre so many frequenters in London as now, and never was there so much written of it, of a certain sort. The last addition to its literature is *The Play* (1, Kelso-place, Kensington), which gives weekly, for a penny, fair and sensible criticisms of new productions, and play-bills of all the theatres,—twenty-six. The number for November 3rd includes a touching poem, for recitation, 'titled "Drink," from the able pen of Mrs. Aylmer-Gowing.—— From the *Leisure Hour* office, 56, Paternoster-row, comes another pile of serials, all cheap, wholesome literature, with capital illustrations; the *Leisure Hour* itself, the *Sunday at Home*, and the *Cottager and Artisan*, a penny paper. The *Boy's Own Paper* and the *Girl's Own Paper*, from the same publishing office, are both well adapted to their purpose, and will be welcome anywhere amongst the young.——"Aunt Judy's Magazine" (Bogue) includes some charming writing and pretty illustrations. Our only objection is that some of the stories are a little over-sad. Why dash their bright spirits? Sorrow will come soon enough.——"Routledge's Christmas Number" is also intended for the young, and well fulfils its purpose. It includes eight full-page illustrations in colours.——In "Art and Letters, an Illustrated Monthly Magazine of Fine Art and Fiction," conducted by Mr. Comyns Carr (Remington & Co.), it is intended, if we understand rightly, to utilise some of the engravings given in the French journal *L'Art*. Under no other circumstances, probably, could so many excellent illustrations be given in the new venture at its present price. It promises to take a good place.——To remove from *L'Art* the more ephemeral portion of its usual contents, the proprietors have commenced the publication of a smaller journal, *Chronique de l'Art*, containing the art notes and current news heretofore printed in the former work, and which is sent gratuitously to its subscribers, while it can be bought separately by those who do not subscribe to *L'Art*. The number of serial publications in connexion with the fine arts is remarkable, especially if we look back to the bareness in this department of literature that existed when Mr. S. C. Hall first started the *Art Journal*, and the time it took to create a public for it. The good service done by this pioneer ought never to be forgotten, as it sometimes is.——*The Magazine of Art* (Cassell) for 1881, bound, forms a delightful book, whether for the eye or the understanding. It is impossible to open it at a page without finding something to interest. "The Homes of our Artists" makes a good feature in it. The two illustrated articles under this heading given in the present volume serve to show strikingly the splendour in which our distinguished countrymen, Sir Frederick Leighton and Mr. Millais, live and work. And, mind you, gentle youths, who are looking admiringly, perhaps a little enviously, on the magnificent apartments and costly surroundings here depicted, this is all the result, not of inheritance, not of mere luck, but of downright, resolute, and continuous hard work, developing original genius.

Miscellanea.

The Danger of Timber-covered Wells.—The danger to which the following refers is so little suspected, and yet, as is here proved, is so possible, that it deserves publicity. On the 2nd inst. as Vice-Chancellor Bristowe and Mr. Beckett (editor of the *Provincial Price Book*) were surveying an untenanted mansion in the neighbourhood of Crewe, an accident occurred which might have had more serious results. The Vice-Chancellor walked in the entrance-hall on a pump-well which had been covered with oak timbers, and looked perfectly safe, when the whole suddenly gave way under him, and he fell to the bottom. Fortunately, in falling, he obtained foothold on a cross-bearer some distance down the well, and, with Mr. Beckett's assistance, was able to sustain himself until further help could be obtained, when he was extricated from his dangerous position.

The Silicate Paint Company have received advice that their manufactures have been awarded the Gold Medal at the Adelaide Exhibition.

The Second Annual Food Exhibition, now open in the Agricultural Hall, contains much to interest everybody. There are a few matters of special interest to our readers. Messrs. Ashton & Green (Limited) exhibit a good collection of cooking-ranges, including the "Birmingham" and the "Phœnix Independent," but their chief novelty is their "Master" range (registered), which is a model of compactness, as will be seen when we state that the 36-in. size contains an oven 20 in. by 20 in. by 16 in., and a boiler to hold twenty-eight pints. It is a "close" range, and requires no setting. It needs but a small fire, and appears to be admirably adapted for use in blocks of artisans' dwellings and in the "back additions" of ordinary dwelling-houses. Messrs. Waygood & Co., besides some ingenious machinery for grocers' use, such as a gas-heated coffee-roaster and a mechanical sugar-chopper, show their patent self-sustaining lift, well suited for hotels, coffee taverns, factories, warehouses, &c. Their dinner-lifts are calculated to greatly facilitate the serving of food hot from the kitchen, and are deservedly coming largely into use. Messrs. Thos. Thomas & Sons, of Cardiff, exhibit their "automatic" self-sustaining lifts for various purposes. Of the great merits of these lifts we have spoken on previous occasions. Their "safety" hoisting crabs, cranes, and derrick winches, of which the handles cannot fly back, nor the load run down, are simple and ingenious. Turning the handles one way raises the load, turning them the reverse way lowers it. The load is always self-sustained, so that the handles may be left at any moment and will remain still. These appliances are eminently worthy of the attention of builders and others. Mr. E. S. Hindley, of Bourton, Dorset, exhibits horizontal and vertical engines and boilers, some of which supply the power for actuating the "Brush" electrical machines for lighting the hall. Messrs. F. Sage & Co. show by means of drawings what they can do in the way of shop fronts and fittings and show-cases. For excellence and variety of work of this kind this firm enjoys deservedly a high repute.

Middlesbrough. — Building operations in Middlesbrough, according to the *North-Eastern Daily Gazette*, have recommenced, — a very striking and hopeful indication of the change which has been steadily going on for some time. Mr. Almgill is erecting a small block of cottages in the Borough Field; Mr. Johnson has two houses on the way in Grange-road; a valuable block in Grange-road, which has been standing for years, has passed into new hands, and is now being completed; Mr. T. Imeson is erecting two spacious villas at the Albert Park, and is completing two others on the Linthorpe Estate; some progress is being made at Swatters Carr; foundations are being "dug out" in Union-street; and in three or four other instances land has been purchased or laid out with a view to its being utilised for workmen's dwellings. There are still empty houses in Middlesbrough, but the chief cause of this is that they have been allowed during the protracted depression in trade to fall into a state of dilapidation which renders them unfit for human habitation. Although it will take a long time to restore property in Middlesbrough to anything approaching its once reputed value, the contrast between the present and not very distant past, when there were some 3,000 empty houses there, is striking, and thus far satisfactory.

Smoke Abatement Exhibition.—At the meeting of the committee on Tuesday, at 44, Berners-street, it was announced that the Society of Arts had resolved to add, to the other prizes offered in connexion with this exhibition, a special medal to be given in the name of their Society, and Lord Alfred Churchill was nominated to act with the committee. It was reported by the hon. secretary (Mr. Wm. R. E. Coles) that the arrangements for completing the exhibition were being pushed on as fast as practicable, and that the applications for space were in excess of the amount at present available, and that fresh room would, if possible, be made for certain exhibits of special interest.

Houses in Bristol. — According to the returns of the rate-collectors, there are about 33,000 occupied houses in Bristol, and over 1,000 unoccupied.

Shutters.—Messrs. Salmon, Barnes, & Co., of Ulverston, have fitted up their patent iron balance-weight shutters to the new bank in Baker-street.

New Municipal Buildings at Launceston have been opened. The style of architecture selected by the joint architects (Messrs. Hine & Odgers, of Plymouth, and Mr. Otho B. Peter, of Launceston) is sixteenth-century Gothic. There is a central castellated tower, 15 ft. square and 60 ft. high, and a circular clock staircase at the south-west angle, leading to two rooms and a clock-chamber. From the tower a corridor on the left leads to the council-chamber. Its internal measurement is 20 ft. by 30 ft., and so far it is the largest room in the building. It has three three-light windows in the north wall, and one in the east wall. The former are filled with cathedral glass, and the latter, which is at the head of the chamber, is of stained glass, the subjects being the coats of arms and mottoes of past mayors of the borough. The centre piece is the Launceston borough arms, dated 1573, the date of the last charter. The carving has been done by Mr. Harry Hems, sculptor, of Exeter, in red Corsehill stone, from Dumfriesshire. It is surrounded by the arms of the most distinguished mayors. The window is by Messrs. Fouracre, of Plymouth. In addition to the council-chamber there are two committee-rooms, 14 ft. by 18 ft., a passage by the side entrance dividing them from the main room. Above these two committee-rooms is a large chamber, in which it is intended to fit up a local museum. There are also porters' rooms and lavatories. The walls are of local stone, from many different quarries. Mr. Congdon, of St. Stephens, was the builder. As soon as the funds can be obtained it is proposed to complete the buildings by erecting a large hall.

New Museum, Free Library, and School of Art, Stafford.—The new building erected by the Corporation of Stafford, from designs by Mr. J. B. McCallum, the borough surveyor, for the purposes of a museum, free library, and school of art, was formally opened on the 3rd inst. The building is situate in Eastgate-street, and adjoins the Borough Hall, being entered by the passage at the end of the hall, and having an internal communication with the corridor of the Assembly-room. It covers an area of about 225 square yards. The library and reading-room occupy the ground-floor, and the first-floor is taken up by the Wragge Museum, leaving the second floor for the art and science school. The dimensions of the rooms are 37 ft. by 37 ft. The frontage is composed of red brick, with ornamental designs in terra cotta, supplied from the Brereton works of Mr. Arthur Gee, of Stafford, the contractor. The work, which includes some scrolls and medallions in terra cotta, has been completed by Mr. A. Gee at a cost, exclusive of site, of 2,000*l*. The total cost was estimated at 3,000*l*., which is made chargeable upon the borough fund, the penny free library rate being only available for working expenses.

London and Middlesex Archæological Society.—The session of 1881-82 will commence on Monday, the 14th inst., when a paper will be read by Mr. Edwin Nash, F.R.I.B.A., entitled "Some Archæological Notes in Middlesex." The evening meetings will be continued as usual from November to May inclusive, and the following members have promised to read papers:—Mr. C. R. Rivington, "On the Registers of the Stationers' Company." Mr. H. B. Wheatley, F.S.A., "On the Site of the Adelphi." Communications are also expected from Alderman Hanson, F.S.A.; Mr. Wilfrid Cripps, F.S.A. (author of "Old English Plate"); and other members of the society. The "History of Monken Hadley," by the Rev. F. C. Cass, M.A., will be ready for issue almost immediately.

The late Mr. John Crawley.—We are glad to hear that the practice of the late Mr. John Crawley, of Bloomsbury-square, has been taken over by Mr. Joseph Stanislaus Hansom, F.R.I.B.A., of Alfred-place West, South Kensington, on terms of advantage to Mr. Crawley's family. Mr. Crawley was latterly engaged on the new Roman Catholic Church at Portsmouth, two churches at Brighton, and other important works. He had in progress also plans for a new cathedral at Hong Kong, which has been unavoidably delayed by his illness and death; but they are now being pushed on by Mr. Hansom.

"Victory over Sewer Gas." — We have received another letter from Mr. Cosmo Innes on this subject, but cannot find space for it. The matter is fully before our readers, and they can judge for themselves. A correspondent who writes admiringly of Mr. Mineard's system must accept the same reply.

The Building Exhibition, 1882.—This, the third Building Exhibition held at the Agricultural Hall, will be opened on March 20th, and remain open until the 1st of April. It will be under the same management as the previous exhibitions, and bids fair to continue the success already achieved. Applications for space should be sent to the Secretary and Manager, Mr. John Black, 161, Strand, without delay, for we are informed that more than three-fourths of the area of the hall have been already allotted to intending exhibitors.

Wilmington, Kent.—A new south aisle and heating-chamber have just been added to the parish church, and were opened on the 26th ult. Messrs. Naylar & Son, of Rochester, were the contractors; the architect being Mr. W. G. Bartleet, of New Broad-street. The total cost of the works has been about 1,600*l*.

Stoke.—The Stoke Town Council have resolved to purchase twenty-one acres of land in front of the infirmary for a cemetery, which the town will shortly require. The estimated outlay is rather under 5,000*l*., exclusive of chapels.

TENDERS

For stables and Coach-house, Jay's-mews, Kensington-gore. Mr. Basil Champneys, architect. Quantities supplied:—

Coles	£1,237	0	0
Higgs & Hill	1,234	0	0
Lascelles	1,208	0	0
Sawyer	1,253	0	0
Hobson	1,196	0	0
Adamson	1,187	0	0
Bywaters	1,183	0	0

For repairs and alterations to the Horse and Trumpeter public-house, Nottingham. Mr. Frederick Jackson, architect. Quantities supplied by the architect:—

G. Bell & Son, Nottingham	£1,060	0	0
Wood Brothers, Nottingham	1,059	0	0
William Bailey, Nottingham	997	0	0
Marriott & Wartnaby, Nottingham	830	0	0
Samuel Hind, Nottingham	803	0	0
Enoch Hind, Nottingham	772	10	0
Bradley & Barker, Nottingham	745	0	0
R. Middleton, Nottingham*	730	0	0

* accepted.

Accepted for plumber's, plasterer's, slater's, and iron-founder's work, Carlisle Grammar School. Messrs. Hetherington & Oliver, architects. Quantities by architects:—

W. Anderson, plumber	£879	10	0
T. Nanson, slater	435	0	0
Staufield & Son, ironfounders	432	10	3½
R. M. Ormerod, plasterer	397	0	0

For building two houses in North-street, Stepney, for Mr. Romain. Mr. C. A. Legg, architect:—

Elves	£425	0	0
Croft	4 0	0	0
Judd	397	0	0

For alterations, repairs, and additions to No. 10, Claremont-square, N., and for additional buildings in rear, for Dr. Abercrombie. Mr. A. J. Beesley, architect. Quantities supplied by Mr. Henry Nutt.

Allen (accepted).

Accepted for alterations and fitting-up of premises, 8, Russell-street, Leek, for the Leek Liberal Club. Messrs. William Sugden & Son, architects:—

T. Grace (Contract 1)	£189	10	0
J. & J. Matthews (Contract 2)	136	0	0
J. Heath (Contract 3)	97	0	0

For new branch bank buildings and manager's house at Leek, for the Manchester and Liverpool District Banking Company, Limited. Quantities supplied. Messrs. William Sugden & Son, architects:—

Samuel Warburton	£6,827	0	0
Richard Bradbury	6,774	0	0
John Wharton	6,772	0	0
Southern & Sons	6,660	0	0
H. & R. Inskip	6,485	0	0
J. Massey & Sons (accepted)	6,575	0	0

For the erection of stabling at Kilburn, for Mr. J. Griffiths. Mr. W. Graves, architect:—

Ward & Lamble (accepted).

For decorations and boundary walls to Yoroshi House, Woolwich, for Captain Skinner, R.A. Mr. W. Graves architect:—

Ward & Lamble (accepted).

For the erection of stabling and coach-house in the Edgware-road, Brondesbury, for Mr. J. Currom. Mr. W. Graves, architect:—

Ward & Lamble (accepted).

For the erection and completion of refreshment-bar and waiting-room adjoining the Staines railway-station yard, for Messrs. Charles Ashby & Co. Mr. E. Saunders, architect:—

Joseph Higgs, London (accepted).

For additions and alterations to the Nag's Head public-house, Sunningdale, Berks, for Messrs. Charles Ashby & Co. Mr. E. Saunders, architect:—

Joseph Higgs (accepted).

For alterations and repairs to the Bridge House Hotel, Frimley, Surrey, for Mr. T. F. Harris, Staines. Messrs. Low & Birch, architects:—

Joseph Higgs (accepted).

For the erection and completion of locomotive workshops, two blocks of workshops and one block of offices, for the Metropolitan Railway Company, at Neasden. Mr. J. Tomlinson, jun., architect. Quantities by Mr. A. R. Brede:—

W. J. Botterill	£31,342	0	0
F. Higgs	28,550	0	0
J. Kindell	27,489	0	0
W. Crockett	27,243	0	0
B. Cook & Co.	26,700	0	0
Mattock Bros.	26,548	0	0
Perry & Co.	26,447	0	0
J. Garlick	26,290	0	0
H. Lovatt	26,205	0	0
E. Dawson	26,114	0	0
W. Rigby	25,950	0	0
C. Claridge	25,514	0	0
Vernon & Ewens	24,997	0	0
B. N. Smith	24,838	0	3

For the erection of twenty houses in Gordon House Lane, Highgate-road, for Mr. J. M. Goodall. Mr. H. H. Bridgman, architect. Quantities by Mr. Frederick Thomson:—

		If basements are omitted in first four houses.
Nightingale	£14,581 0 0	£14,711 0 0
Dove Brothers	14,476 0 0	14,395 0 0
Merritt & Ashby	14,463 0 0	14,303 0 0
Burman	14,452 0 0	14,283 0 0
Crockett	13,800 0 0	13,800 0 0
Morter	13,650 0 0	13,548 0 0
Manley	12,945 0 0	12,085 0 0
Gould & Brand	12,890 0 0	12,740 0 0
Tarrant & Son	12,873 0 0	12,741 0 0
Richardson Brothers	12,703 0 0	12,656 0 0
Paramor & Son, Margate	12,740 0 0	13,630 0 0
Kirk & Randall	12,700 0 0	12,600 0 0
Perry & Co.	12,689 0 0	12,589 0 0
Shurmur	12,573 0 0	12,501 0 0
Wall Brothers	12,475 0 0	13,347 0 0
Scrivener & Co.	12,368 0 0	12,232 0 0
Drew	12,340 0 0	12,234 0 0
White	12,190 0 0	12,074 0 0
Dixon	11,835 0 0	11,754 0 0
Toms (accepted)	11,827 0 0	11,689 0 0

For six detached villa residences in the Lansdown-road, Ashburnham Estate, Bedford, for Messrs. Hawkins & Ashwell. Mr. H. H. Bridgman, architect. Quantities by Mr. F. Thomson:—

Thos. Spencer, Bedford (accepted)	£6,683 5 0

For a detached villa residence in The Oval, Ashburnham Estate, Bedford, for Messrs. Hawkins & Ashwell. Mr. H. H. Bridgman, architect:—

Thos. Spencer, Bedford (accepted)	£1,241 0 0

For pulling down and rebuilding the premises, No. 10, Finsbury-square, for the "United Kingdom Assurance Corporation, Limited." Mr. Frederick Hammond, architect. Quantities not supplied:—

Dove Brothers	£1,655 0 0
Prescott	1,250 0 0
H. L. & R. Roberts	1,083 0 0
J. H. Johnson (accepted)	2,197 0 0

For rebuilding Nos. 9 and 10, Tokenhouse-yard, Lothbury, City. Mr. R. E. Tyler, architect. Quantities by Mr. Barnett:—

Green	£8,389 0 0
Colls & Son	8,152 0 0
Clarke & Bracey	7,959 0 0
Wilson & Exton	7,787 0 0
Patrick & Son	7,785 0 0
McLachlan & Sons	7,678 0 0
Nightingale	7,584 0 0
Grover	7,547 0 0
Merritt & Ashby	7,547 0 0

For completion of two houses at Crouch-hill. Mr. Walter Stair, architect. Quantities by Mr. H. J. Kirk, surveyor:—

Gladwell	£973 0 0
Peck	840 5 0
Legers	840 0 0

For the erection of street portion of the new factory buildings on the premises of the Old College Ironworks, St. Alban's, for Messrs. John Freshwater & Company (Limited). Mr. Bertram A. Raves, architect, Welwyn Quantities by the architect:—

J. & W. Savage, St. Alban's	£732 0 0
C. Miskin, St. Alban's	680 0 0
W. Carlin, St. Alban's	666 10 0
J. Mead, St. Alban's	657 0 0
G. Capper, St. Alban's (accepted)	570 0 0

For alterations to shop at Canning-town. Mr. Walter Stair, architect:—

McLean	£1,510 0 0
Cawthorne	1,450 0 0
Hall	1,310 0 0
Gladwell	1,200 0 0
Clark	1,170 0 0

For engineering works in connexion with the laundry and bath-house, &c. at the Kensington and Chelsea District School, Banstead, for the Managers. Messrs. A. & C. Harston, architects:—

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Clements	1,250 0 0
May	1,080 0 0
Bradford & Co., High Holborn*	994 10 0

* Accepted.

For the erection of a "Mission House" at St. Leonard's-road, Bromley, Middlesex, for Miss Emily Currie. Messrs. A. & C. Harston, architects. Quantities supplied:—

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Carpenter & Poole, Pentonville	697 0 0
Ditto, reduced to and accepted at	653 0 0

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Wilkes & Company, London (accepted).

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VOL. XLI. No. 2124. SATURDAY, NOVEMBER 19, 1881.

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The New Etruscan Room in the British Museum.

In our recent notice of the principal objects of interest in the new Egyptian Rooms of the British Museum a subsequent account of the contents of the new room which is devoted to the display of Etruscan fictilia and sculptures was promised; this promise it is proposed to fulfil on the present occasion. The removal of the Palæontological Collections under the charge of Professor Owen, C.B., and Dr. H. Woodward, F.R.S., from the north-west corner of the upper floor at Bloomsbury gave an opportunity for exhibiting this fine series of Etruscan relics, of which Professor C. T. Newton, C.B., keeper of the Greek and Roman Antiquities, was not slow to take advantage. These Etruscan relics, which have been gradually acquired by the trustees, have never before been shown to the general public in any order of instructive arrangement. Indeed, almost all of them have been stowed away, for the last decade or longer, in the vaults of the basement floor, where they were difficult of access to the mere sight-seer, and equally difficult of examination by the critical student or archæologist. These circumstances, however, have now passed away. The Museum is gradually throwing off the feeling of overfulness which was once so universal in it, and a very short space of time has elapsed since the transference of the Natural History collections to that branch of the British Museum which, although still subject to the control of the Principal Librarian, is located at South Kensington, before the shifting of the unrivalled collection of Etruscan art remains has been made from the dark recesses and vaulted cellars of the British Museum to a new and admirably suitable position, where they will enjoy the advantages of being better lighted, more instructively grouped together, and more readily inspected by the ever-increasing number of persons who are rapidly becoming aware that the only true and profitable way of studying ancient art is to make a personal examination of the actual remains.

The relics which Etruscan sepulchres have richly and abundantly yielded to the scientific excavator are, in point of material, analogous to those of other sites and of other European nations. Glass, supposed to be of Phœnician origin, has been found in the tombs; gold objects, principally objects of personal ornament, beautifully worked in forms and patterns which defy even the most skilful of modern goldsmiths to imitate or reproduce them; and bronze figures and vases which manifest a highly-cultivated acquaintance with the manifold arts of the metal-worker, have been discovered in considerable quantities on the sites of ancient Etrurian cities and cemeteries. Of these three sub-divisions of Etruscan remains many specimens of especial beauty and value are in the collections of the British Museum. But they are displayed in the rooms devoted to the exhibition of similar materials from other archæological sources; hence they must be sought for in the Glass, the Gold, and the Bronze Rooms in other parts of the upper floor.

The New Etruscan Room, to a notice of which the present article is designed, is destined to an exhibition of the pottery and stone remains; and putting aside for the moment any consideration of other materials, in these two alone true and native Etruscan art, both in style and feeling, may be as well studied as it is thereby excellently illustrated. Commencing with the terra-cottas and fictilia, the first few cases at the left-hand corner farthest away from the doorway which leads from the new Egyptian Room to this are filled with specimens of vases and other miscellaneous specimens of pottery. Dr. Birch, one of our best authorities on the subject, divides the vases into four varieties: 1, brown ware; 2, black ware; 3, red ware; and, 4, yellow ware. The brown wares are apparently the oldest, their colour is a greyish brown, probably from having been imperfectly baked; sometimes, however, they are red in the centre. Some vases of this class, the fabric of which is exceedingly coarse, and which are ornamented with rude decorations, consisting of punctured or incised lines, spirals, raised zigzags, bosses, and projecting ornaments, applied after the body of the vase was made, resemble in their character the Teutonic vases which have been found on the banks of the Rhine, and certain Celtic examples that occur in France and Britain, from which they are often scarcely to be distinguished. They consist of jugs, *oinochoai*, small vases with two handles, and wide cups like the *kyathos*. In the rudeness of their shapes and peculiar treatment, they seem to be imitations of vases carved out of wood, such as we know the *kissibion* to have been. The most remarkable and interesting of this class are those found under the volcanic tufo, near the Alban lakes, which are in the shape of a tugurium or cottage, and must have contained the ashes of early inhabitants of Latium. There is one of these latter placed among the vases; another one, of somewhat larger dimensions, presented by Mr. W. R. Hamilton, found at Monte Albano in 1817, is placed under the windows on the right hand near the door. This is filled with the ashes of the dead, which were introduced by a little door, afterwards secured by a cord passing through two rings at its sides and tied round the vessel. The cover or roof is vaulted and apparently intended to represent the beams of a house or cottage. The exterior has been ornamented with a Mæander in white paint, traces of which still remain. They were placed within a large two-handled vase, which protected them from any superincumbent mass.

Close to these are specimens of the black ware with lustrous, jet-like polish, made, according to some authorities, of black bituminous earth found in the Etruscan territory, or, according to others, of yellow clay, darkened by casting the smoke of the furnace on it. It was baked in kilns at a low temperature. An *oinochoe* of this ware, and a vase with moulded figures on it, from Vulci, in this collection, have been figured by Dr. Birch in his "History of Ancient Pottery." Among other objects a male and a female mask will attract the visitor in this class of ware. Near these are those of a later period, when a finer material was employed, and the shapes and details of the ornamentation were chiefly imitated or adopted from contemporary works in bronze. In this style the ornament frequently consists of a frieze, or band, with representations of men, animals, and monsters. In this case are also three specimens of red Etruscan ware, on one of which is a frieze, with two draped figures reclining on a couch, beneath which are two birds. At the head of the couch stands a naked male figure, playing on the double flute at the foot are two vases and a branch. Towards them another similar figure is advancing, holding an instrument thought by some to be a strainer. Behind this group is a female stretched at full length on a couch, with a low table at the side, and another male figure, also undraped, advances towards the foot of the couch. This subject is repeated seven times, and appears to have been impressed by rolling a cylinder with subjects in intaglio along the body of the vase. Of the third or red ware are several examples. Some of them are flat circular dishes of fine paste, the broad and flat lips of which have similar friezes impressed in bas-relief with a rolling cylinder. These vases, of which there are three in the Museum cases, are very old, according to a very good authority, probably B.C. 700. They are generally found in the older Etruscan cemeteries, in the tunnelled tombs of Cervetri, or Caere Vetus, or at Tarquinii, and on the site of Veii. Of the pale yellow ware of fine quality, but imperfectly fired, are certain *lekythoi* and perfume-vases, sometimes found in the more ancient sepulchres, but the general mass of the pale ware appears referable to a late period.

Of Etruscan fictile vessels a large number has been collected, and there is scarcely a museum or a tolerably large private collection of antiquities without some specimens. Bricks and tiles were, probably, rarely employed; some, however, are extant with inscriptions painted or engraved upon them; and one writer of authority considers that tiles were used to close the recesses in sepulchral chambers, within which

were placed the small sarcophagi holding the ashes of the dead. The sepulchres of Chiusi, the ancient Clusium or Camars, have contributed some of these. There are some, also, with Latin and Etruscan bilingual inscriptions as late in point of date as the Republic or the Empire. Some pottery has been found under strata of peperino of considerable age.

Near the vases is a table-case of antefixal ornaments in terra-cotta of the yellow or light reddish-yellow class. These are mostly from Capua, and form the ornaments of roof tiles. They are impressed in bold relief with female heads, masks, harpies, gorgonic heads, a draped figure holding two lions, and a figure on a horse with a goose below on the ground. These, in many cases, preserve traces of colouring laid on rudely. On the top of this case is placed a canopic figure in the form of a cinerary urn, with two human arms for the handles, and a cover in the form of a human face or iconic head. Close by is a seated figure in terra-cotta, probably also of sepulchral or cinerary employment; and on the other side of the cast of a capital of foliated design, called, from its subject, the "Paris and Helen" capital, from the central support of a large tomb, another cinerary figure, with holes pierced in the head to allow of the escape of steam in the process of baking, or of effluvia from the ashes of the dead. This latter figure is seated, so to speak, for it has no legs or feet, in a large curule chair with curved and spreading back. On the right-hand side of the doorway, between the windows is a somewhat similar figure of yellowish-red clay, seated in a hollow box-like plinth. It has large earrings, and the dress, or toga, is deeply scratched with lines crossing like network about 1 in. apart, in a fretty or lozengy pattern. In the centre of the row of windows on the right-hand side of the room is a large vase of considerable age with a reeded body, widened lip, and narrow base, having on the shoulder a frieze of the peculiar style already described, in which is depicted a chariot scene.

The Etruscans enjoyed a reputation for their works in clay; but few statues of any importance have come down to us, yet the art of modelling in clay preceded that of working in metals, an art in which also the Etruscans particularly excelled, especially in the mechanical treatment. The most remarkable Etruscan terra-cotta group for its size and execution known, is that of a male and female figure reposing on a couch, of the same style of art as the early bronzes and wall-paintings of the sepulchres of Italy. The figures are of life-size, of slender proportions, with smiling features, the drapery flat and formal. It is made of a clay mixed with volcanic sand, resembling the red ware, and is decorated with colour. It comes from Cervetri, a site of prolific yield to the archæologist, which has not only contributed this group to the Louvre, but a group in many respects very similar to it, which was acquired from Signor Castellani by the Trustees of the British Museum, and now occupies a central position in the new room. Much has been written of this remarkable terra-cotta group placed upon the lid of a sarcophagus, the body of which is ornamented, after the late Etruscan style, with a frieze or band replenished with battle and banqueting scenes. It will be remembered that the Rev. Isaac Taylor, about the time of its acquisition, declared in the *Athenæum* his belief, founded on philological reasons in connexion with the inscription which it contains, that it was not a genuine object of antiquity; and Mr. Dennis, one of the greatest authorities on Etruscan monuments, who has given, in his newe dition of "The Cities and Cemeteries of Etruria," vol. i., p. 279, a graphic description of the Louvre sarcophagus mentioned above, speaking farther on of the yet more primitive character and peculiarly indigenous art of the British Museum terra-cotta sarcophagus, declares that Italian antiquaries generally doubt its genuineness. On the other hand, the inscription is observed by Mr. Newton to be in very early Greek characters rather than Etruscan, yet, like the latter, it is written from right to left. The room contains several other terra-cotta sarcophagi, among others two large ones from a tomb at Vulci. The lower part, which held the body, is in shape of a rectangular box or trough. On the covers are recumbent Etruscan females, modelled at full length. One of these has both its cover and chest divided into two portions, a fact probably to be accounted for in the fact that masses of too large a size were apt to fail in the process of baking.

We may aptly close the notice of the Etruscan terra-cotta, by Mr. Newton's description of the remarkable sarcophagus which occupies so prominent a position in a room dedicated to the ancient art of Etruria. He says, "This Etruscan sarcophagus consists of a coffin, richly decorated all round, the four corners of which rest each on a pedestal ornamented with the bust of a siren or harpy. On the cover of the coffin are a male and female figure reclining on a mattress. The male figure is naked, and his meagre and emaciated condition seems caused by age and sickness, though perhaps much of the peculiarity of the type may be due to the want of skill in the artist in the representation of nude forms. The female figure wears a close-fitting *chiton*, which does not reach to the feet. Her hair falls in long tresses over her bosom, and is gathered into a thick queue behind. Round her neck is a necklace with pendants, resembling some very ancient ornaments in silver and amber found at Palestrina, and now in the Castellani collection of jewels. Her right hand is raised as if she held out something, which the male figure advances his right hand to receive. His left elbow rests on two flat cushions, on which a painted Mæander is still visible. The style of these figures is archaic, the treatment throughout very naturalistic, in which a curious striving after truth in anatomical details gives animation to the group, in spite of extreme ungainliness of form, and ungraceful composition. The groups seem to have been made in parts, filled in after passage through the furnace. The relief on the front of the coffin represents a battle between two warriors, each attended by one male and two female figures. At either end of the scene is a winged figure; these probably represent the souls of the two warriors. On the opposite side of the coffin is represented a banquet, at which a male and female figure recline. At one end are two warriors, each of whom appears to be taking leave of two female relations. At the other end are two pairs of females, seated in chairs, in a mourning attitude. It is to be presumed that the four scenes thus represented on the sides of the coffin have relation to one another, and that the four subjects represented are the leave-taking of two warriors before going to single combat; the death of one of them; the mourning for that death; and the funeral feast, or possibly the reception of the slain warrior in the realms of bliss. But the particular single combat represented has not yet been identified. It should be noticed that in the single combat a lion is represented fastening on the leg of the falling warrior. Above the battle-scene is an Etruscan inscription painted in two lines, one of which is along the edge of the mattress, the other immediately below. The letters are identical with the earliest forms of the Greek. The inscription is very similar to that on a gold fibula found at Chiusi, but its interpretation is not yet determined. In the Louvre is a terra-cotta sarcophagus found at Cervetri, and formerly in the Campana Collection, on which are two relief figures, very similar in type and composition to these, but showing more sense of beauty, and more artistic skill in their design and execution. These two sarcophagi may be reckoned amongst the earliest known specimens of the fictile art of Etruria. There is no positive evidence as to their age, but they can hardly be later than B.C. 500." Dennis, however, considers the Museum sarcophagus to be earlier than that in the Louvre.

The stone relics, which form by far the largest proportion of remains in the Etruscan Room, may be divided into three classes: 1, the statues; 2, *cistæ*; 3, sarcophagi. Of the first there are only two examples in the British Museum. One is a full-sized male figure, draped and seated in a chair. The body is divided horizontally, and hollowed out, in all probability to receive the mortal remains of him whose portraiture it claims to represent. This comes from Chiusi, and is of considerable age. The other is a stone figure of a female, draped, holding a long-horned bird of peculiar shape in the left hand. The stone seems to be a very old kind of alabaster, and has been thickly gilded. It comes from the Polledrara tomb at Vulci, and has been described at length in Micali's "Monumenti Inediti." Of the second class, that of the *cistæ*, there are four remarkable examples, placed on the left-hand side of the room in the floor-space in front of the glass cases. The one nearest to the entrance-door has an elegant moulding as seen in profile. It bears four separate scenes on its sides in low relief. The subjects are,—funeral rites; music; a banquet or sepulchral feast, where a dog and a casket have been introduced by the artist under the couch of the guests; persons lamenting with uplifted hands; and a female figure on a bier attended by four mourners. The second *cista* has also four scenes in the same style of relief. Here occur the player on the double pipe or flute, a player on the lyre, a music band, and a group of mourners with hands upraised and finger stretched out in that peculiar attitude of wonder and alarm which may be noticed in some of the earliest illustrated manuscripts. The profile of the moulding here also is worthy of notice by the professional architect for its delicate simplicity and harmonious balance of proportion. The third *cista*, which has likewise an interesting moulding in plan or outline, shows us a group in which there is a dog and a vase under the banqueting-table, geese under another table, and a party of huntsmen equipped with a kind of pastoral crook. The fourth and last of these objects near the table-case of Capuan antefixal ornaments comes, like the others, from Chiusi. Its subjects are,—a banquet with a dog and a goose on the floor; two warriors leading their horses; a group of hunters armed with the crook and the spear, and attended by a man carrying the game slung on a yoke or pole over his shoulders; and a band of warriors whose armour consists of spears or javelins, the round shield, and the helmet with a long crested ridge reaching far down the shoulders of the wearer. Behind this *cista*, and at the left side of the gilded female figure holding the mystic bird, is a small sarcophagus or cist, of an intermediate type between the *cista* already mentioned and the sarcophagi proper, which we are about to describe. On the lid is a female figure laid out in death upon a funereal couch. The hair of the figure is disposed in six ample plaits upon her breast; the drapery is curiously archaic, and the mattress on which the body rests has a kind of double pillow at the head, and an undulating or wavelike bed. On the frieze below are two lions attacking a bull and two reclining Satyrs. The feet of the couch have a strange kind of antefixal ornament. This remarkable object comes from Caere.

The stone sarcophagi form the great bulk of the Etruscan Collection in the British Museum. In all there are about fifty of these relics. They are of all sizes, from 1 ft. long, and about the same in height, to about 7 ft. long and 6 ft. in height. The material of which they are composed is of various kinds; the dull greenish tufo, a whitish calcareous rock, and a yellowish, lustrous kind, somewhat resembling a marmoreal alabaster, being the favourite vehicles employed by the sculptors of these conventional cippi. A large proportion of them have upon the lid a recumbent figure, generally more or less iconic, propped up upon the left elbow, holding in the right hand a concave sacrificial patera, with a central boss, and wearing round the neck a chaplet of flowers, or of a kind of woollen material. This form is probably figurative of the deceased reclining on the festive couch, as described by Dennis, vol. i., p. 394. A few figures wore finger-rings, and one has a mirror in the hand. Among the subjects of the small urns, sarcophagi, or cippi, which are arranged in glass cases around the wall of the room, are many of Greek origin. They are well carved, as a rule, in bold and salient relief. Here we may see two Centaurs carrying off Lapithæ women; Paris and his companions carrying off Helena and the treasures of Menelaos; Ulysses and his companions passing the Sirens; Orestes and Pylades putting Klytemnestra and Ægisthos to death; Achilles slaying Troilus; the tragic death of Eteokles and Polyneikes, as tragically related in the "Septem contra Thebas"; the death of Hippolytus, his horse being terrified by a bull sent against him by the order of Poseidon; and another similar subject into which is introduced the figure of Artemis holding a torch. In others are:—Achilles slaying Penthesilea in her chariot; Telephos threatening to kill the infant Orestes in the presence of Klytemnestra, and Agamemnon with three Greek warriors; and four examples of the combat of two Greek warriors, probably Eteokles and Polyneikes, in the presence of a winged female figure holding a torch, and perhaps intended to represent Thanatos, or Death. Warriors, bouquets, floral ornaments, and animals' heads are also found on the smaller and less pretentious of these carvings.

It now remains only to speak of the larger

sarcophagi arranged under the windows on the right-hand side of the room. As we enter the room, the first is the stone cover of a sarcophagus of which the lower part or cist is wanting. On it is a recumbent female figure in relief, holding a *thyrsos* or branch, and a *kantharos* or vase. At her side is a deer. This comes from the early tomb called the "Grotta del Triclinio" or "Grotta Marzi," as it is also called, at Corneto or Tarquinii, discovered in 1830 by Marzi and Fossati, and of which Dennis, i. 318, gives a detailed notice. Next in order is a well-carved sarcophagus, with a recumbent effigy on the lid. On the front of the box is a winged male figure leading a *biga* or two-horsed chariot, attended by three lictors with their fasces and a trumpeter. This was brought from Toscanella, and the inscription forms the subject of especial lucubrations by Fabretti and Corssen. Close to this is another slab with a recumbent figure at full length holding a *kantharos*; and near to it a fine and spacious sarcophagus, without the lid, carved on both sides with scenes from the "Iliupersis," or taking of Troy. This was found in the "Tomb of the Chariots" at Corneto or Tarquinii, and is described at length by Campanari in his "Etruscan and Greek Antiquities." In proximity to this is another sarcophagus, with the usual recumbent figure on the lid, having on the front a Gorgon or Medusa's head between two marine monsters, ridden by youths. By the side of this are casts of two small lions, of rude workmanship, and probably of very great antiquity. At the north-west corner of the room is another sarcophagus, with the usual effigy leaning on the left elbow, and supported by a wedge-shaped pillow upon the lid. The front of the coffin in this case is ornamented with a head, perhaps of Medusa or a Gorgon, between two dolphins of primitive design. In front of the lions, and opposite the table-case of terra cotta antefixal ornaments, one of the most interesting sarcophagi is placed. This comes from the tomb known as the "Grotta dipinta" of Bomarzo, about twelve miles east of Viterbo, where extensive excavations have been made. In many respects this sarcophagus is unique. It seems from the sloping roof, joint-tiles, and antefixæ to have represented a house or temple, yet nothing like a door is shown. The lid has a winged sphinx at each end of the ridge of the roof, and in the middle are a pair of serpents curiously knotted together like ropes; and it appears highly probable, as Dennis asserts, from this and the other adornments of the sarcophagus, as well as from a serpent jar painted on the wall of the tomb itself, that this was the sepulchre of some augur or aruspex skilled in the mysteries of the Etruscan disciplina" and in interpreting the will of the gods. His name, inscribed on the sarcophagus, was "Vel Urinates," a family name met with at Castel d'Asso, on a rock tomb, and at Volterra, Chiusi, and Perugia, among Etruscan antiquities. The antefixæ of this sarcophagus are female heads, probably larvæ, like those on the black-ware of Chiusi and Sarteano. At each end of the sculpture are griffins, or beasts of prey, devouring antelopes, and on the sides, at each angle, is a figure, also in relief, one side representing Charon or Mantus, with a hammer and crested snake in his hands, balanced by Lasa, or Fate, with a scroll; the other the goddess Nortia, with a hammer and a nail, balanced by a warrior, with sword and shield. The whole was originally covered with stucco and coloured, and traces of red, black, and blue may still be detected. Near this is a sarcophagus, with the conventional recumbent figure, an incuse inscription, and two marine creatures on the front panel, from Toscanella. A smaller temple-shaped cist or sarcophagus, with sloping imbricated roof, and carved feet, is placed behind the cists on the left of the doorway, and may be compared in some parts of its form with the remarkable coffin of Vel Urinates, the soothsayer of Bomarzo.

Over the wall-cases are a series of painted facsimiles, by Signor Campanari, of the walls of an Etruscan tomb at Tarquinii, decorated with a double frieze. In the lower are represented dances and entertainments, and in the upper athletic games, as leaping, running, chariot-racing, hurling the discus, boxing, and the armed course. Above is a large vase and persons at an entertainment. The sides of the entrance to this tomb, decorated with two panthers, are also shown. Such are the principal objects of this marvellous collection of antiquities. The educational arrangement and artistic display reflect great credit on the keeper of the department to which they belong, and although, undoubtedly, the exhibition would be enhanced by the addition of bronze and gold Etruscan relics, yet, as the collection at present stands, there is considerable profit to be gained by those who study these antiquities aright; for, like most other monuments, they are eloquent, though silent, and speak readily enough to those who can understand them.

SOME POINTS IN THE INSTITUTE ADDRESS.

The opening meeting at the Institute last week was crowded to the doors, showing that so far at least the new President commands the support of a large number of members, as we should have expected. Those who may have come partly out of a wish to hear what new views, if any, on the subject of architecture might be put forth by a president whose general professional tendencies are so different from those of his recent predecessors in office, or who expected a very marked "new departure" in regard to the ideas to be entertained as to the object and influence of the Institute of Architects, would not have felt their expectations fully realised. Mr. Street, indeed, seemed specially desirous to show that he, though professedly an "art-architect," could take as practical a view of matters as any of his recent predecessors, and his address, chiefly concerned in indicating in what direction lay the lines of usefulness of the Institute, was marked by the absence of observations specially relating to architectural design or architectural art in its pure form.

This turn of the address is noticeable because the President in the first paragraph observed that he considered that the scientific side of architecture had received disproportionate attention lately in comparison with the artistic side. Our own judgment would be, in the Scriptural phrase, "These things ought ye to have done, and not to leave the other undone." The scientific side of architecture is of such great importance, being, in fact, the basis of the whole and that without which architecture can hardly be said to be fulfilling its mission at all, that it would take very strong evidence to make us think that we had reached a point at which little more attention to it was necessary. A great deal of practical work has been done at the Institute during the last session, and we pointed out, in a few words the other day in regard to the new volume of the Transactions, that here was at least an answer to the charge often recklessly made by newspaper writers and their readers, that the architects of the day were not giving attention to practical questions. But we fear it is too soon yet to say of English architects that as a body they are honourably distinguished for the way in which they deal with new forms of construction, drainage, and water-supply, &c. Some architects of the day have distinguished themselves among their fellows by special attention to these subjects, but the distinction is not one at present very difficult, relatively speaking, to acquire. The phrase "English comfort," quoted by Mr. Street, refers in the main to characteristics in regard to our habits of living and of furnishing our houses which do not come quite under the same category as questions of drainage and ventilation, and are the result of influences other than those of the architect. A great many people still consider it "English comfort" to have a large dinner-party in a room without the slightest provision for ventilation, and in a great many, we rather fear a majority of cases, the architect says and does nothing to induce them to be less easily contented. In the matter of drainage we are probably more advanced (where our best theory and practice have been applied) than any other European nation. In many other matters connected with house comfort we might probably have many hints to take from other nations, the French and Americans especially. In the exhibition of sanitary appliances during the medical congress we could not but notice how almost entirely insular was the exhibition in character, and how many things might have been shown there which are at present only known to us in French treatises on "Chauffage et Ventilation," and other cognate subjects. In relation to this we may be allowed to observe that the special intention in the founding of a new endowment for professional study by the editor of this journal, which was incidentally referred to in another part of the address, does not seem to have been quite fully apprehended. The position, it may be once more explained, is this; there are several endowments in the Institute for encouraging young architects and students to study, sketch, and measure ancient buildings abroad and at home, but abroad chiefly: there is one (the Grissell medal), specially intended to promote the study of construction. But there was no special inducement to students to study the *modern* buildings of other countries in their practical aspect, thus to see what could be learned from them and to keep our own country up to the mark in planning and construction and other practical details. This, it will be admitted, is as important in its way, and as much within the proper scope of the work of an educational institution (which the Institute is, to some extent), as the promotion of sketching tours in which the sentiment of ancient architecture, rather than the requirements of modern architecture, is the object.

In the stand which Mr. Street made in favour of solid and substantial building, and its great importance even when there is not a question of anything higher in the scale of architecture than mere substantiality, we, of course, quite agree. Whether the prevalent jerry-building of the speculating builder is really at all to be traced to the bad example of flimsy building under architectural rule, we should be disposed to question. The worst building executed under an architect is better than the speculating builder's average work; and a great many of the speculating builder's pet "vanities," such as exuberant plaster cornices and plaster arches, are derived much more from the traditions of a generation or two back than from the present. We imagine the public are the most to blame for the fact that the speculating builder in these days flourishes like a green bay-tree. Population is increasing fast, and the lower middle class public want dwellings very fast, and are either ignorant or careless as to their construction, and hence the natural results of these favourable circumstances for unprincipled and grasping builders.

There were two other points in the address which really belong to the same subject, viz.: the degree of influence which the Institute might reasonably expect to exercise in controlling and directing matters of public taste in regard to the architectural treatment of London, and the laying out of streets and sites. In regard to this, reference was first made to the part which the Institute of Architects had been invited to take in passing judgment on the designs of buildings to be erected in Northumberland-avenue. We consider the architectural profession may think it a matter for congratulation, in one sense, that such an arrangement was made law. It at once showed a growing feeling of the importance of having good architecture in a new thoroughfare, and of respect for the architectural profession in inviting their representative body to occupy the position of arbiters in the case. Nevertheless, we cannot but agree with Mr. Street that the position is an awkward and doubtful one. To ask the Council of the Institute, or, indeed, any architect or body of architects, to sit in judgment on designs and pronounce that they are or are not good enough for the occasion, is to place him or them in a very uncomfortable dilemma. Either they must be very critical and exacting, and hence lie under the imputation of being ungenerous towards those whose plans are submitted to them, or they must pass whatever is not glaringly bad, even if quite beneath the standard of taste of the majority among them, with the almost certain result of being saddled with a kind of responsibility for what is erected under their supposed sanction, and of having the new street or new buildings pointed out as exhibiting the taste of the Institute of Architects. But upon the question of mere prevention or regulation of public works which might be disfigurements to important points in what may be called city scenery, there certainly might be some good to be done by the Institute, if it were allowed the opportunity. Mr. Street's references to the additions to the Post-office, as well as to various railway bridges and stations, among other things, were sufficiently to the point. The disfigurement of the Thames by the dreadfully ugly viaduct over the river at Blackfriars is a thing that might have been prevented, on such grounds, but we know not how any case would have been made out against the adjoining bridge for ordinary traffic, which is in one sense the most objectionable of the two, as it is a pretentious and sham piece of work, whereas the viaduct is at least genuine in its ugliness. But

if any constituted body or any individual had made a stand against the erection of the Blackfriars roadway bridge on account of its vulgarity of design, he would have been met with the answer, "Here are columns and capitals and a balustrade, things which give the bridge that architectural appearance which you desire. You say they are in bad taste; we do not see it, and we challenge you to prove it"; and then there would have been the old dispute "*de gustibus*." On such a head there may be perfectly reasonable and maintainable judgments passed, which, nevertheless, it would be exceedingly difficult to put into any form which would afford a good ground for legal or official action. The difficulty will never be really got over in that way. But the advice of the Institute might certainly be of value in the determination of such questions as sites for important buildings, and the proper consideration, before it was too late, of the manner in which this or that proposed treatment of the site would affect the general *coup d'œil* and the relation of the new buildings to existing structures. But, after all, the necessity for this would lie chiefly in the fact that our Government and some of our large public bodies are too often in the habit of employing official advice only, and hence are led to under-rate or altogether ignore questions of architectural effect. If they employed an architect of high standing and ability, and went by his judgment, the result would be the same as if they employed the Council of the Institute as a kind of honorary consulting architects, or perhaps it would be more satisfactory, for the latter proceeding, after all, seems like a method of getting architectural advice *gratis*.

The idea of the appointment of a permanent Minister of Fine Arts, which has often been mooted in these columns, is naturally suggested in connexion with the subject of the control of the architectural treatment of London; but any one recommending such an appointment must be very careful to consider, first, exactly what he means by it,—what he intends the functions of such a minister to be. Mr. Street's reference to the subject evidently filled Sir F. Leighton's mind with anxiety, and he uttered some warning words about it in his speech proposing a vote of thanks for the address; and most certainly the appointment of any minister on the part of the State who was to act as a kind of arbiter of taste would be not only an evil to art, but an absurdity. What we have more than once proposed, and what, perhaps, Mr. Street intended, was that the office of First Commissioner of Works should be extended in its scope, and made independent of political changes, with which its objects have naturally no connexion whatever. Such a functionary might, if a judicious appointment were made, be of the highest use as a central controller of all works connected with public improvement and the promotion of the arts, without by any means necessarily interfering in matters that were really questions of taste, further than by a veto upon projects which, on due weight of evidence, seemed manifestly injurious to the interests of art progress, or to the beauty or convenience of the metropolis. Such a project, for instance, as the much-needed and often-asked-for museum of casts, also referred to in the Presidential address, would come under the management of the permanent Commissioner, and be his to initiate, perhaps, and to keep up. One great and clear gain would be the avoidance of the change of plans owing to a political crisis, when First Commissioner A. has to leave a scheme which he has just matured in the hands of his successor, B., who may have entirely different ideas,—perhaps entirely mistaken ones,—and undo all his predecessor's work, an absurd condition of things in regard to matters which have nothing whatever to do with politics.

Upon the question of the amalgamation, on some footing or other, of the Institute and the Architectural Association, we do not care to comment, regarding it as a matter for the two bodies themselves to make up their minds about, beyond saying that we can quite understand the members of the Association feeling that they do not care to give over to the nominal credit of the older society a system of architectural education which they have themselves worked out independently. Whether by enrolling under the Institute they would obtain any compensating advantages is a point for them to consider.

There is one other important,—very important,—subject touched upon by Mr. Street, upon which we would gladly have heard a little more from him. This is the demolition of the City churches. That we cordially go with him in lamenting in advance the grievous loss to the City of London if any large proportion of these remarkable and characteristic buildings were removed, as is threatened, no one, we are sure, will doubt. The moan over the fate of some and possible fate of others, has, however, been made often; we should have been glad if Mr. Street had gone further and given us some suggestion as to what to do with the churches so as to turn them to some account, instead of leaving in favour of the demolitionists the weighty argument, "These buildings are of no further use, and are taking up space which is urgently needed." We are by no means disposed to back this merely utilitarian view, but it must be taken account of and appeased, if possible; otherwise it will have its way sooner or later, and it is impossible to oppose it indefinitely. The question is one apart, practically, from considerations of orthodoxy in regard to church worship; because, let all the community be as orthodox as you please, the members who would otherwise go to the churches live out of the reach of them now; and many even of the absurdly small congregations who do *not* fill them, come from a long distance for the special purpose apparently of making a congregation. If Mr. Street, besides expressing his regret at the demolition of these often beautiful buildings, had gone a step further and suggested any means whereby they could be better utilised, so as to abolish the present practical arguments in favour of their removal, he would have done something for their preservation. We may suggest for a discussion at one of the meetings, "What is to be done with the City churches?"

SCARBOROUGH.

The first historic mention of Scarborough is in a Saga, the story of which is strangely unlike that of the town now: for the fierce Norse King Harold "lay to at Skardaborger," fought with the burghers, set fire to the town, and "slew many people" before he went to his fate at Stamford Bridge. But to the gazer from the ruined Castle or Mount down on the gay town, there is no more resemblance to that spoken of by the Saga Phillips quotes in his "Yorkshire," than there is to the town Leland saw partly walled with stone, partly with earth and mud. There is no more varied sight than that of Scarborough in its season; and possibly of all our watering-places it is the one that exhibits most fully all the phases of British life and character. It is incontestably the queen of the Northern watering-places; it has of recent years shown a spirit in catering for the wants of its visitors that none others have attempted; and it is to this that there is attributable the increased popularity of this ancient health-resort. It has a wide area to draw upon; the great towns of the greatest county yield it a continuous flow of visitors, and some of those near it give it a residential population, spending freely the earnings of the manufactories in the smoky valleys. Its ancient port is also the resort of another class, and in their season the fishing-boats cluster thickly, tier on tier, in the little harbours, and form a distinctive feature of the seascape. From its configuration, the peculiarities of life in Scarborough approach near together, and from that centre of fashionable life, the Grand Hotel, a stone might almost be thrown into the throng that gathers round the returning fisher-boats.

Look from the yard of the castle which for seven centuries has dominated over Scarborough. In late autumn there are few more varied scenes than it shows, especially in the gloaming, or on the afternoon of that day that is tautologically said to "come betwixt the Saturday and Monday." The town on a rock has expanded north and south. Look to the north from that gray castle, with its walls enclosing only the green fields now. The streets on the northern portion are comparatively quiet, and many an invalid has lingered there to inhale the sea breezes. The promenade pier stretches its 1,000 ft. seawards, and the coast ruggedly ranges its cliffs and sands along by the well-known woods of Scalby, and on towards that little wyke where Robin Hood's Bay keeps green the memory of the bold outlaw, and preserves in the romantic little village a hardy race of prosperous fisher-folk and of other sea dependents, whose dwellings, ranged unevenly on the cliff side, form one of the quaintest pictures that the Yorkshire coast presents. But it is to the south that the view from the castle cliff shows Scarborough at its best.

Down below, on the side of the harbour, are crowded, uneven streets of ruddy-tiled houses, whose irregular heights and liberal-minded gables tell of the builders of old. In the harbour, at low tide, there is a huddled mass of cobles, fishing-smacks, and steamboats, brown sails lying idly on the decks of the former, and purple nets littering the holds, whilst the gazer can readily discern the mystical letters that tell to the initiated the port the boat hails from. On that margin of the shore close to the West Pier fishermen abound, the "guernsey" being frequent, and the rough pilot-cloth seen frequently along the Foreshore-road. But before the close of this, fashionable Scarborough has put in its claim.

That stretch of road and cliff from the public baths, by the "tramway" and the Grand Hotel, to the Spa grounds is, in its season, one of the fashionable resorts not alone of a county, but almost of a country. Sea and shore, hotel and cliff, grounds dotted with trees, valleys, bridges, and an esplanade crowned with villas and dwellings, and based on a terraced mass of verdure, form, when peopled with the gay frequenters, a splendid sight. At night it gathers its charms into the Spa grounds, or the dimmer recesses of the Aquarium. Seat yourself in one of those chairs that are ranged in rows near the band-stand; listen to the strains that float therefrom, and the deep low bass that the sea continually gives out before you; or look from one of the upper terraces down on the scene, lighted by its row of electric lights, that make the more regular gas-lamps yellow at the time of their intermittent show, and in that crowd and that spectacle you have one that the east coast of England cannot parallel from its farthest north to long past Lincolnshire. The long procession moves to and fro in couples and groups, showing all the vagaries of feminine fashion, from the creamiest of oatmeal cloth to the darkest hue of velvet. In the grand hall, in the fine little theatre, in the dining-rooms, you may find hundreds congregated, whilst despite these attractions, the click of the billiard-balls is frequent above, and on the upper terraces there are the countless couples who take "no note of time" in the leafy promenades till the distant bells proclaim it with heavy tongue. Here gather portly aldermen from distant towns, in autumn evenings, to discuss provincial politics, business in cotton or cloths or iron; here their helpmates face the sea breezes, and gossip, and dawdle over novels that are glanced at, not read, whilst the ever-shifting scene varies as the groups pass and repass, as the pieces are changed by the band, as the waves show on the sand under the mellow moonlight that "Brush's system" flings from its tall lamps. Here the invalid finds momentary rest; here the young and the gay meet, form acquaintance and deepen it in the successive visits, till the walk from the promenade to the terraces seems a frequent step to that sequel which has its opening scene at the altar.

It is largely owing to its success that Scarborough succeeds. To those natural attractions that it has,—in situation, where the breeze blows landward from over the wold, and seawards across leagues of German ocean foam,—and in configuration of hills and dale, with its two bays, the Castle Cliff dividing the fashionable from the quiet resort of the health-seeker,—to these attractions great additions have been made, and that especially of recent years. It is a year only since the Spa, with its stately adjuncts, was re-opened; its Aquarium is young, but boasts of its size; and, wise in its generation, the town has taken care to provide itself with hotels in all degrees of magnificence. There are few that, alike in situation and surroundings, in appearance and cost, can surpass that Grand Hotel that projects its tall stories high from the cliffs, whilst others only less costly and magnificent on the cliff claim their share of that sea view and those breezes that are dear to the visitors. So Scarborough, with its prolonged season, is always charming, except on the days when the excursion trains disgorge the hordes who for a few hours have to see the "lions," and to attend to the wants of creature-loving people from large towns of the shires of York and Lancaster. Spring buds out the beauties of wood and pleasure garden around it; summer commences that gay life that is prolonged until the period of the Indian summer even is past;

and even in winter, when the storm-wind descends, and the rude ocean beats at the promenade walls and batters the craft in the harbour, Scarborough in its idleness and rest has its touch of romance that beautifies it.

DRAWINGS BY THE LATE SAMUEL PALMER.

A FINE collection of the drawings, with a few etchings, of this remarkable artist, is now being exhibited at the rooms of the Fine Art Society in Bond-street. Palmer had, it seems, arranged for this collective exhibition during his lifetime, and accordingly the Society of Water Colours, who had intended to collect some of his works in the gallery which they have so often adorned, at one of their Annual Exhibitions, gave up the idea in order not to interfere with this collective exhibition.

Samuel Palmer, who died in May last at the age of seventy-six, practising his art almost to the last, was an artist of peculiar and special powers, and with a very marked line of his own. His most characteristic work belonged to a stage of artistic feeling in regard to landscape which has dropped out of general favour and popularity of late years, and many habitual frequenters of the Society of Water Colours' Exhibition recently, we have found, hardly knew Palmer's name or his style, and his drawings were often passed over as something odd and old-fashioned. His work has, however, always enjoyed the appreciation of a number of the best of his brother artists, and he is at present also the object of the incense of the ring of æsthetic critics, to whom the fact that he was a friend of Blake would be almost enough to secure his apotheosis. We observe that the catalogue is prefaced by some somewhat tawdry sentimentalising. Palmer, however, was worth something better than to be made the object of this kind of adulation. A large proportion of his finest works belong, it must be confessed, to a conventional and unreal school of landscape art; he was one of those painters for whom nature is not good enough, and who made ideal effects of his own, such as are hardly to be found in real landscape. We think that such art is not so true nor so lasting a thing as that which is directly based on nature; but there is a place for it, and Palmer carried it out in a very grand manner. We have several times pointed out how remarkably, in some of the very small and powerfully-coloured landscapes which he used to send to the Water Colour Society's exhibitions, he had exhibited the effect of grand and monumental painting on a small, sometimes almost a minute, scale; and also how he overstepped the bounds and became violent and exaggerated in effect when he tried the same thing on a larger scale in the pictures on subjects from "L'Allegro," his last exhibited works at the Water-Colour Gallery in Pall Mall East. These drawings hang at the top of the room in Bond-street, and, of course, are praised up to the skies in the introduction to the catalogue; but most persons who can discriminate irrespective of fashion will regard them as unfortunate results of pushing a favourite effect too far.

A large number of Palmer's works, however (and some of the finest of them find place in this collection), are of lasting interest as very fine landscape poems and remarkable examples of very powerful handling and a peculiar feeling for rich and glowing effects of light and colour. In looking at such works as, among others, "Twilight" (7), "The Herdsman" (10), "A Golden City" (13), "The Traveller" (52), we are in a land of enchanted ground where the lights are more golden and the shadows more rich in purple than nature spreads them over the scene; they are usually Classic landscapes, somewhat recalling Turner in composition, but quite different in the solidity and opaqueness with which they are painted. They are not the least like ordinary water-colours; the colour is laid on in thick and powerful masses, and to some extent, in its very peculiar texture and manipulations, recals the strange effect of his friend Blake's water-colour drawings, or what pass for such (for no one knows precisely what they are). Palmer's massive way of painting, or almost building up a landscape, is shown to great advantage in some of his cloud-scenery; as, for instance, in the fine and powerful little work, called "The Bright Cloud" (6). Some of his finest works are in illustration of Milton, with whose poetry his landscape has a good deal of affinity, and it must be remembered that Milton's descriptions of landscape are somewhat artificial and unreal. "The Curfew" and "Towered Cities please us then" are two very fine examples. Palmer would have been the very artist to have realised the sombre and rich landscapes of Spenser's "Fairy Queen," and we cannot but wish he had undertaken to illustrate some of that poet's haunted scenery. One of the latest schemes of Palmer's life was a metrical translation of the Eclogues of Virgil, with his own illustrations; this was projected and ten etchings made for it, but the work was never completed or published. Was the "Early Ploughman" one of these? It reminds us of Virgil, but rather of the Georgics than the Eclogues.

There is, however, another interest in this exhibition of Palmer's works, as it shows us that his choice of a highly-wrought and unreal landscape was not owing to any incapability of representing the freshness of nature as she really is. He seems to have had two styles, one at hand when he sketched from nature, which is entirely different in tone and colour from his "poetic" works, and shows the greatest freedom and boldness, and the other which his best-known works illustrate. Of his naturalistic or sketching style there are some very fine examples, such as "The Aged Oak" (12), which would hardly be taken for the work of the same hand or mind as many of the other drawings. The excellences of this style of drawing, however, are such as are found equally in such painters as David Cox and others; the excellences of Palmer's poetic landscape style are entirely his own, and hence they are the more interesting because the more individual and original works. They are not like nature, but they are beautiful works to dream and indulge the fancy over, and we want art which will help us to do that, as well as the art which interprets nature.

PROFESSIONAL TOPICS AT THE ARCHITECTURAL ASSOCIATION.

MR. ASTON WEBB, president of the Architectural Association, in the course of his address at the first ordinary general meeting of the session, delivered on Friday, the 11th inst., after reviewing the work of the Association in detail, said,—

I am afraid I have wearied many by reiterating details you already knew well; but I have thought it part of my duty on this, the only occasion I have, to bring before those who have recently joined us the various branches of work in which we are engaged; and possibly also to our older members, who come here less often than they did, it may not be without interest. One thing, I believe, is generally admitted, that there is a want in the profession which we are endeavouring, not altogether unsuccessfully, to supply. We carry on our work here, as we hope, in support of the Institute,—each having its distinct work,—the Institute, as our representative professional society before the world; the Association as the educational society to assist men to prepare for their profession. The importance or the responsibility of our work can hardly be over-estimated. Wellington believed most of the battles of the world were won at our public schools, and so, probably, the foundation of many a great reputation will be laid here. Last Monday, Professor Street, in his opening address at the Institute, very kindly alluded to us, and expressed a decided opinion that "some means might and ought to be devised for enabling that active body [referring to the Architectural Association] to join us," and farther, "he does not hesitate to say that the Institute suffers much and seriously by the practical abstinence of young men from its meetings its society, and its work," and he attributed this abstinence to the Association. Such an opinion, coming from such a source, must carry great weight with it. I hope that some present may give us their views on the subject, for there are many here whose opinion will, from their long and intimate connexion with the Association, carry more weight than mine could do. Nevertheless, I feel that it is my duty to say a few words on a proposition so kindly broached (though not by any means for the first time) by Mr. Street. Gentlemen, I cannot think that any one is hindered from joining the Institute or its work by this Association; rather, as it appears to me, we are a sort of forcing-house from which members blossom out into the Institute. Mr. Street thinks "some means might, be devised whereby our junior members might, under their own government, be training themselves until they gradually fall into their places amongst us"; but this, I claim, is precisely what the Association does. I find that 54 of our members are now Fellows, and 170 are Associates, and that six are members of the council. I venture to think the members of this Association do take a part in the affairs of the Institute whenever they can be of use. That they should speak much at the meetings is hardly to be expected, or perhaps desired, but even during last session they on one or two important occasions took a somewhat prominent part in its affairs, and the training received here at our ordinary meetings appears to me admirably adapted to prepare men to take a part subsequently in the more august proceedings of the "upper house." Should any scheme be submitted to us in furtherance of the views expressed by Professor Street, it would receive, of course, our careful attention; but the system on which our work here has been gradually built up has succeeded so well, and the prosperity of the Institute has also so largely increased at the same time, that I, for one, cannot but think that we support the Institute more in our independent position than by any other means, and that the system so carefully worked up is of great use and will be still more so by preparing our students for membership of that body. Having now touched on most of the branches of the Association and its work, the more general question arises as to how these opportunities can be best utilised by a student entering our profession. One is constantly being asked what course to recommend, and this has led me to think it over a little, and possibly the opinion I have come to may be of some use to those who still have a future. I do think, as I said the other evening, that there are now in our profession ample means for the thorough education of an architect, but that, owing to their present disjointed condition, comparatively little advantage is derived from them to what might be the case, and that it is as true now as years ago when this subject first came prominently before us, that the education of an architect is of a most haphazard and incomplete kind, altogether inadequate and unfit to prepare a man for the intricate and ever-increasing problems and duties of our profession. We seem to require some central authority or college under which these various opportunities could be made of full value to architects. For instance, at present all the subsidiary means of education beyond those of a practical kind supplied in the architect's office are to be had only of an evening, when a pupil, if he has worked hard all day, cannot bring a fresh intellect to bear on the various equally important subjects brought before him, and as the theoretical parts of his education cannot in the circumstances of the case be together in the office, they are either neglected or picked up in the evening. What appears to me to be wanted is a college or school where a student could spend one or two years in systematic and theoretical education before entering an architect's office.

But to take the means as they exist. The Institute has founded a compulsory examination, but professedly takes no part in the preparation of students for it, and the work of this Association therefore becomes more defined, and it is to it that the student must first look for instruction. My own impression is that one fault often made at the commencement is that boys leave school too soon, and are articled at sixteen or seventeen, just as they are commencing to learn the higher branches of education, and that they regret, as they get into practice afterwards, they were not allowed to remain a year or two longer to acquire information they are never able afterwards to obtain.

But suppose our student to be articled to a great London architect, where he has every opportunity of seeing that a great amount of work is being done, but not, perhaps, much as to how it is done,—or he may be in a small office, where he sees both the work in execution and how it is done. Both have their advantages, and neither are sufficient in themselves. He should, I think, follow some such course as this:—The first year he should attend our Elementary Class of Design, and read at home such books as he is recommended and can obtain; the second year he should join the Class of Design and also of Construction, and endeavour to get a prize at one of them; during his holiday he should spend part of the time in sketching, and publish some of his sketches in the Sketch

Book; the third year he might, with advantage, attend the lectures at University or King's Colleges, in addition to attending either the Class of Design or Construction here, and he might also compete for the Association medal or measured drawings prize. The fourth year he should become a student at the Academy, and join the Colour or the Advanced Construction Class, and compete for the Association travelling studentship. The fifth year he should work at the Academy and one of our classes, probably as one of its officers, and compete for the Pugin studentship or the Soane medallion; after this he should, if possible, take a trip abroad, and on his return compete for one of the great prizes offered at the Academy, while at the same time he has gone into another office, to seek further experience, or commenced practice in a small way on his own account. This is an incomplete sketch of an architect's opportunities, and the curriculum must, of course, vary according to circumstances; but if students laid down for themselves some such order of study, and worked to it from the commencement, they would find the various opportunities more useful to them than they are at present. This question of education is not only for the individual good, but it affects the profession generally; each member of it, by his acquirements, or lack of them, and by his executed works, most distinctly raises or lowers his profession in the eyes of the public, and, therefore, increases or diminishes its influence with them; and every building erected by an architect which is inconvenient for its purposes, unstable, or ill-designed, inflicts a direct injury not only on himself, but also on the profession to which he belongs. In aiding, therefore, as far as we can, the cause of architectural education, we are aiding also the influence of our profession in the world of art generally, and, therefore it is, as I venture to think, that this Association is so well supported by the profession generally. The one objection that used to be often raised against us here, but which is perhaps not so often heard now, is that we are too apt to become a mutual admiration society. I am not concerned to deny this; but if it is the case with 800 members, it must be on a very extended scale; and as long as the mutual admiration is extended to each other, and not to ourselves, I see no harm in it: perhaps even a little more of it in the profession generally would not be thrown away.

One of the questions that must affect us at the present time is as to how far the archæological side of our art has too much overengrossed us, and as to how far it should form a portion of our architectural education. That it must, and always must, form a part, is obvious; it is like grammar to a language, without which knowledge design is impossible, for originality of design never yet came from ignorance of what had gone before. I once heard of an instance where an architect was engaged on an important building of a special class, and he called in a draughtsman to assist him in it, and said, "Now, I want you to design this on such and such lines, but I don't want you to see any building of the sort before you make your drawings, as I want something perfectly original." The result was a failure. Archæology is, therefore, a *sine quâ non* to a student; but I think it can be carried too far, and directly we begin to make mere notes of detail for the purpose of "working them in," we leave our position of designer for that of copyist. The great movement for the restoration of our churches led to much of this archæology, and possibly the fascination of it is apt to lead us too far, and to check the originality which all seem to feel and are yet unable to produce; and I think we may see some of the result of it in the lack of enthusiasm there appears to be in the architectural world just at present. We seem to have no principles at the moment which are thought worth fighting for, and the principal questions before us in any form seem to make only a ripple, which will soon die away, and are nearly all of a negative character. These are some of them:—"We ought not to restore any more churches;" "we ought not to take out our own quantities;" "we ought not to go into competitions;" and the *British Quarterly* has laboured to prove "we ought not to have too much work to do." The Architectural Conference discussed two of these points over again at their last meeting, though they had done so before, apparently in default of any others occurring to them; but none of them can be said to be questions likely to stir up much enthusiasm one way or the other. The Anti-Restoration Society (to call it by a shorter name) was only started when restoration was drawing to a close, and therefore is not likely to exercise much influence. Opinions as to the taking out of quantities seem very equally balanced; those who do so see no harm in it; those who do not, think it better to leave them alone.

The competition question seems fairly laid to rest by an almost unanimous expression of opinion in favour of the appointment of a referee, and it appears to be an excellent arrangement (especially for the referee); and, for myself, I should be very sorry to see the competition system any further restricted. As to the *British Quarterly*'s complaint that pluralism is the crying evil, it certainly is not the special grievance, amongst architects generally, that they have too much to do, and the few that have are likely to continue to have while they retain the confidence of their clients.

It appears to me that what we require in addition to a thorough knowledge of previous styles and buildings, is a more careful study of the best buildings of our own day, for there are, undoubtedly, some built every year of which we, and those who come after us, may be justly proud. Attempts to master the principles on which these are designed, and to develope our work carefully and thoughtfully for ourselves from them, seems to me to be the course which promises the best results; and to avail ourselves of all modern improvements and inventions as they are brought forward. We, as architects, should also be men of the world, observant of the habits and requirements of the present day, and ever thinking how best we can adapt our buildings to them; the churches should show by their planning the gradual change of ritual, and the plan should be adapted to the peculiar requirements of large and small congregations of the present day. Our middle-class private schools and Sunday schools afford a large field for improvement and ingenuity in planning. The adaptation of the latest sanitary improvements to the architectural treatment of our houses is another subject yet to be satisfactorily dealt with (and Mr. Ingress Bell has chosen a most interesting subject to read us a paper on, viz., "Ideal Dwellings"). These are some of the great questions which we, as architects, must have to deal with, and be prepared to advise upon. The designing of furniture, carpets, &c., watercolour sketching, and such like, are very enticing (as I know, having dabbled a little in such like myself); but architecture is a bigger thing than these, and demands, in order to produce really great buildings, all the resources we can command; it is also an ennobling work, and worth all the efforts we can make to master it.

Have an ideal and work up to it, and the higher the ideal we fix for ourselves the better will be our work, falling, as it always must, far short of our ideal. There is no room for sentimentalism in our art, for we soon find ourselves pulled up sharp in the stern matter-of-fact requirements which are involved in whatever we are called upon to design. But it is an art of great opportunities; no matter how small or insignificant the work may be apparently, if we design with care it must be interesting to others as well as to ourselves. After all, it is the individual thought and care displayed by the designer of any building, great or small, which gives interest to it apart from style. The architect of the Jews' House at Lincoln probably never thought that his "little job" half way up the hill would be examined, criticised, and measured up countless times nearly 800 years afterwards. And there is no one in this room but will probably have a commission entrusted to him to that extent before he has been a year in practice; and if he takes all the pains and uses all the power he has in him,—spends, as one says, his life-blood on his work,—*he* can make it interesting also, and the interest will endure as long as his work does, and we, of all artists, should do work to endure.

Speaking of individuality, I will quote, in conclusion, one passage of Thomas Carlyle's, spoken to mankind, but applicable to us:—"Produce! produce! were it but the pitifullest infinitesimal fraction of a product, produce it, in God's name! 'T is the utmost thou hast in thee; out with it, then. Up, up! Whatsoever thy hand findeth to do, do it with all thy might. Work while it is called to-day, for the night cometh wherein no man can work."

We defer our report of the discussion that ensued until next week.

NOTES FROM THE WEST.

A good deal of interest has been excited, not only in Bristol, but in scientific circles elsewhere, by the suggestion of Mr. Wm. Smith to the Bristol Town Council, that the tidal force of the Avon might be in some way utilised. Mr. Smith proposed that the Sanitary Committee take the matter in hand, and, aided by engineering skill, should see in what way the power now running to waste could be used, but the Corporation did not see fit to adopt his idea. The subject has not, however, been lost sight of, and Mr. Smith has laid it before several eminent electricians at the International Exhibition at Paris, besides consulting local scientists. Sir Charles Bright, one of the British commissioners at the exhibition, has, in a letter, expressed an opinion that the utilisation of the tidal power of the Avon is beyond all doubt practicable, whether for the electrical illumination of the city, or otherwise. The idea of making use of the tide has nothing new about it, but with Faure's batteries the practical possibilities of the situation are placed in a different position, and it has been estimated that only one-sixth the amount of energy available would be required for the complete lighting of Bristol. Whether the rise and fall of the tide could be made use of without interfering with the present navigation) and as the tide runs several miles beyond the point to which vessels come up, there would seem little difficulty about this), and whether such a utilisation of natural energy would be feasible with the river wholly or partially dockised (both of which schemes have many advocates) has, of course, to be shown. Sir Charles Bright will probably run down to Bristol to make inquiries on the subject.

The parish church of St. Thomas, Wickwar, which has for sixteen months been undergoing thorough renovation, has just been re-opened. So misty are the records of its origin that some have it St. Thomas is the patron saint, and others that it is dedicated to the Holy Trinity. The place has so often been repaired that very little of the original structure remains. The Virgin Chapel at the end of the north aisle is the oldest part, and in the east of the chapel a piscina was discovered beneath the plaster during the alterations, and has been preserved. The church is in the Early English style, and has a lofty western tower. The renovation has been very complete, and has been under the direction of Mr. W. L. Bernard, architect, of Bristol, carried out by Mr. J. Roach (Charfield) and Mr. Lewis Lowell (Wickwar). Several of the walls have been entirely rebuilt, and massive columns separating the nave from the aisles have been replaced by lighter ones. The arcade has been lengthened by the addition of an arch, and the internal arrangements are nearly all new. A vestry-hall has also been built on the north side of the chancel and the tower repaired.

It is proposed to spend 2,000*l.* in the restoration of St. Saviour's Church, Larkhall, Bath. The plans of Mr. C. E. Davies, which have been approved, provide for the extension of chancel 22 ft., the reseating of the body of the church so as to give more sittings, the enlargement of the vestry, the removal of the west gallery, &c.

A new church was opened at Penarth a few days ago. The parish church is in such an elevated, exposed position, overlooking the Bristol Channel, that it is in bad weather almost inaccessible. The new church is at the foot of the hill near the railway station. The designs were inexpensive, and the cost was about 700*l.*

The Evangelical Mission at New Swindon have opened a central hall in that district. The cost was 1,200*l.*

Whiteshill Church, Stroud, has been re-opened after extensive alterations, including the addition of a transept, vestry, and organ-chamber. The church will now seat 478 people. A portion of the north and south aisles has been taken down and an archway erected; a wooden gallery or vestry beneath at the west end of the church has been abolished. The cost has been 800*l.*

A stained-glass window, the gift of her Majesty the Queen, has been unveiled at St. Mary's, Bury St. Edmunds.

A new church has been opened at Cwm. It will accommodate 200 persons, is in the Gothic style, and is erected of blue Pennant stone with random courses and buff brick dressings. The cost was 1,300*l.*

The tender of Mr. E. Morgan, of Tredegar, for

1,295*l.*, has been accepted for enlarging the Newbridge Board Schools.

It is proposed to spend 5,000*l.* in building new borough offices, police-station, &c., at Lower Grangetown, Cardiff.

At Maesteg, a market-place, with town-hall over it, has been completed. The hall will seat 1,300 people. Mr. Harris, of Cardiff, was architect, and Mr. Geo. Thomas, Newport, Pem., the contractor.

The foundation-stone of a small church has been laid at Briton Ferry by the Countess of Jersey.

The preliminary heading driven beneath the Severn by the Great Western Railway having been completed, the work of constructing the tunnel itself now engages attention, and will probably for the next two years afford employment for a very large number of men. The importance of the work can hardly be overestimated, and a brief glance at the progress of the undertaking may prove interesting. The idea of a submarine railway to connect the South Wales lines with Bristol and the West, originated nearly twenty years ago, with Mr. Charles Richardson, who noticed that the geological formation of the ground, visible at low-water mark, was not at all unfavourable for such a work, its compactness giving promise of considerable stability from the inroads of the sea to a channel cut beneath it. The work, however, was manifestly of a very different character from the Thames Tunnel, in which that gentleman was engaged, though that was by no means a small undertaking. On the east side of the Severn are the "English stones," as they are termed, extending a mile and a half across and standing above low water; and, corresponding to these on the Welsh side, is the "Lady Bench." Between the two run the "shoots," a deep, narrow passage, which carries all the water at low tide. The elevation of these half-tide rocks on each shore is due to their superior hardness, other portions of the river's bed having been worn away, so that tolerably deep water is found except at this point. The idea of Mr. Richardson was not seen in any practical form till nearly ten years afterwards; and an Act of Parliament having given the necessary authority to the Great Western Railway Company in March, 1873, the actual work was begun. The heading, which occupied close upon seven years to complete, was two miles and a half long. It was 6 ft. to 7 ft. in diameter, and was driven on the Welsh side from a shaft 180 ft. deep, about 11,000 ft., and tolerably level. The "shoots" were thus passed at a considerable depth. Working from the English shore, it was unnecessary to run so deep. The shaft, therefore, was 90 ft. in depth, and the heading ran from it at a descent of 1 ft. in 100 ft. to meet the deeper excavation from the other coast. From the Welsh side the drills had to bore through sandstone, coal shale, and Pennant, and from the Gloucester side the material consisted principally of marl. One of the most serious hindrances to the undertaking was the influx of a land spring to the Welsh heading, which entirely flooded that part, and necessitated the use of powerful and expensive pumping machinery before the water could be got rid of. The heading, which has been so satisfactorily finished, will be used for draining the tunnel, and, as will be seen from the description first given, the water will drain,—roughly speaking,—to the centre, and will have to be pumped out. The tunnel will necessarily be much longer than the heading, and the total length of the working will approach five miles; part of it, however, will consist of a deep cutting. It is being constructed of a width of 25 ft., and a proportionate height, and is being arched over in a substantial manner with brickwork. The tunnel will follow the course of the heading from the new passage side till "the shoots" are passed, and will then gradually ascend. About 1,000 ft. of brickwork have been completed on the Gloucestershire side, and care will be taken to arch in the more suspicious portions of the roof first, so as to prevent possibility of accident. The contractor for the work is Mr. T. A. Walker, and prior to Sir John Hawkshaw's services being enlisted in the undertaking, the engineering department was under the care of Mr. C. Richardson, assisted by Mr. A. W. Gooch and Mr. J. J. Geach. Mr. Luke is resident engineer.

A census of persons attending divine worship in Bristol on October 30th, taken by the *Western Daily Press*, shows that no fewer than 209 places are used for religious services, nearly all being permanent churches and chapels. The morning attendance was 51,689, and the evening 64,459, the population being 206,000. "The city of churches," therefore, as far as attendance goes, compares very favourably with Liverpool, where a similar census was taken.

The new dock at Swansea (opened as already mentioned in the *Builder*, by the Prince of Wales) nearly doubles the accommodation of the port. It has a length of 2,320 ft., and a breadth varying from 500 ft. to 340 ft. The walls, therefore, enclose about 23 acres of water of a depth of 36 ft. The outer sill of the dock will have on it at ordinary spring tides 32 ft. of water. Mr. James Abernethy, president of the Institution of Civil Engineers, designed the work, which cost 300,000*l.*

During alterations in Maryleport-street, a quaint old narrow street in the centre of Bristol, a fine freestone mantelpiece, ornately sculptured, was exhumed from a thick coating of mortar, beneath which its existence was unknown. It has several features of archæological interest about it, and bears a shield charged with the arms of George Harrington, mayor of Bristol in 1617.

GOVERNMENT INSPECTION OF ARCHITECTURAL PLANS IN PRUSSIA.

The Prussian Minister of Public Works has issued a statement indicating the classes of architectural undertakings the plans of which are in future to be submitted to the examination of the Royal Academy of Architecture. The classification is intended to show in which cases this submission is to be obligatory, and in which it is only to be so in the event of the cost exceeding 750,000 marks (37,500*l.*).

In the former category are Parliamentary buildings and edifices connected with the different Government departments; churches intended for more than 1,500 worshippers at one time; museums and galleries of all kinds; State libraries; theatres where the whole or part of the expense is borne by the State; collegiate buildings of universities, technical high schools, military academies, and schools of artillery and engineering; medical institutions and other similar edifices; alterations in the aforesaid buildings, or in any such as possess historic or artistic value; the arrangement of open places, and the erection of monuments; the execution or extension of ship canals, the building of harbours, wharfs, and docks; the systematic regulation of rivers, and works for making them navigable.

In the second division are included buildings for provincial Government offices, for the archives and tax departments of the State, and such Government works as are not included in the preceding category; buildings for judicial purposes, for the postal and Government printing departments, as well as for the telegraph service; general offices of railway companies; educational buildings not included in the other class; astronomical observatories; gymnasia; schools of commerce, art, and navigation; benevolent institutions, prisons, hospitals, and kindred edifices; lighthouses, signal towers, coast fortifications, &c.; the drainage of lakes, the erection of dikes; bridges over arms of the sea or large rivers; sluices, aqueducts, viaducts, and the draining of cities; also important railway stations, particularly such as have an influence on the building plans of large cities.

Increase of Kensington.—At the ordinary meeting of the Kensington Vestry last week, a memorial addressed to the Home Secretary was read, praying for the introduction of a Bill into Parliament for powers to appoint an additional member at the Metropolitan Board of Works for each of the parishes of Kensington, Paddington, and Wandsworth. With respect to the claims of Kensington, it appeared that the vestry was represented by one member only. In 1851 the number of inhabited houses in the parish was 6,166; population, 44,046; and rateable annual value, 228,500*l.* In 1881 the number of inhabited houses had increased to 20,103; population, 162,924; and rateable annual value, 1,648,187*l.* The parish was larger than any of the six parishes returning two members, excepting St. George's, Hanover-square. The vestry resolved to affix their seal to the memorial, and also to one addressed to the Metropolitan Board of Works.

THE EXHIBITION AT PORTO ALEGRE.

The project of a German-Brazilian exhibition at Porto Alegre (the capital of the South Brazilian province of Rio Grande do Sul) originated with the Berlin Association for Commercial Geography. The support from both countries is only partial, as far as the industrial element is concerned. The Brazilian Government has advanced 2,700*l.*, and also 1,000*l.* for gold, silver, and bronze medals. The duration of the exhibition is arranged to be from the 1st of October to the 1st of January. The site is near the Varsia, an extensive exercise-ground. The building was commenced last February under the inspection of Mr. Ahrons, and is mostly constructed of wood. Its five towers, one in the middle and one at each corner, together with the combination of brown, blue, pink, and white paint, are said to remind the observer in some degree of the general character of Swiss châlet architecture. The same colours predominate in the interior of the building. The pillars are of wood, and are joined to graceful arches; the roof is of galvanised iron. The main building is 65 yards in length and 33 yards in width. The whole disposable room, including the galleries, is about 2,100 square yards. The roof is at the sides 6¼ yards from the flooring, and at the loftiest point of the building is at a height of 9¾ yards. The cost of the edifice (about 3,600*l.*) is considered relatively low by the special correspondent of the *Kölnische Zeitung*. The gardens of the exhibition are described as being in an unfinished condition. The lighting of the main building is said to be excellently arranged. Light from above is admitted in three places, and no less than fifty-two windows altogether are in the building.

The wood used in the construction is just as it is delivered by the local saw-mills. A description of wood, called Madera de Lei, having a singular power of resistance to rotting, has been used for the underground portions of the work. Pine and cedar are said to be employed in the structure itself.

GERMAN EXHIBITIONS IN 1881.

Of the four exhibitions which were held in various parts of Germany during the past summer, it is known that in two cases at least the financial results are very unsatisfactory. The great Patent and Pattern Protection Exhibition at Frankfort-on-the-Maine closes with a loss of 800,000 marks, or 40,000*l.* In this case the guarantors will have to be called upon to pay up the amount they guaranteed in full. The Halle Exhibition of Industry was also a failure, but the deficit is far less serious than at Frankfort, amounting only to about 5,000*l.* This, too, will have to be made up by the guarantors. The Stuttgart and Breslau Exhibitions of Industry and Art were less unfortunate, but none of the German Exhibitions of the past summer can show the financial success of the Düsseldorf Exhibition of the previous year, which yielded a very handsome surplus.

MARKET HARBOROUGH SEWERAGE.

The plans for the main sewerage of Market Harborough and the adjoining parishes of Great Bowden and Little Bowden, in the counties of Leicester and Northampton, these parishes forming a united district under one Local Board, having been approved by the Local Government Board, a contract, amounting to 11,950*l.*, has been entered into with Mr. G. Stevenson, of Eckington, near Chesterfield, for carrying the plans into effect. The works are now being executed under the direction of Mr. J. B. Everard, of Leicester, the consulting engineer, with Mr. E. G. Mawbey, the surveyor to the Board, acting as resident engineer and clerk of works.

NEW IRON FOOT-BRIDGE AT STAMFORD.

A new wrought-iron foot-bridge of 90 ft. span has lately been erected by the Corporation of Stamford over the river Welland, to replace one destroyed by the great flood of July, 1880. The total cost, including entirely new abutments and approaches, is between 700*l.* and 800*l.* The work has been executed from the designs and under the superintendence of Mr. J. B. Everard, C.E., of Leicester; the contractors being, for the builder's work, Mr. C. Hinson, of Stamford, and for the ironwork, Messrs. Dawson & Nunneley, of Hunslet, near Leeds. Mr. T. J. Ward, of Stamford, has filled the post of clerk of works

WORKS OF RESTORATION IN FRANCE.

During a recent tour in the northern and southern provinces of France, I was much interested in examining the works of restoration now in progress, and those more recently completed; for most of the churches and buildings classed as "Monuments Historiques" have now been taken in hand by the Government, and large grants given towards the cost of their restoration. At one time complaints were made by archæologists that the French architects were not sufficiently "conservative" in their restorations to suit our ideas of the word "restoration," and that good stonework was condemned, and replaced by new, simply because some corner was chipped off, or such like small injury sustained; and there was, I think, no doubt that much harm was done at one time in this way in France, as, indeed, it was in England; but from recent examination of some of the more important restorations now going on at Rheims, Chartres, Limoges, Clermont, and other places, it is evident that more care is now taken while doing the work in the most thorough manner, to do it with as little interference as possible with the ancient work. The completed restoration of the interiors of Notre Dame at Chalons and the cathedral at Valence are examples of work thoroughly and also well done; while the interior restoration of Perigueux Cathedral, completed some years ago, is an example of work thoroughly, but not well done. In the first two cases the old stonework is carefully cleaned, pointed, and repaired; in the other it is scraped all over and renewed to such an extent that it looks as if just built. The system adopted at Perigueux was but too common at that time; but the more conservative spirit seems to prevail in the restoration of the important buildings now being carried out, and which I had an opportunity of visiting, amongst which are the cathedrals of Rheims, Chartres, Laon, Clermont-Ferrand, Limoges, Nîmes, &c. My notes commenced with the more important of them all, viz.:—

Rheims Cathedral.

The modern works of restoration, though now being very actively pushed forward, were begun as long ago as 1809, and even before then the chapter had been obliged at different times to spend large sums on reparation, sometimes to the extent of 25,000 francs annually. The works in 1809 and onwards were carried out under M. Dubut, architect, and then under M. Rondelet, and at that time the restoration of the north transept and the flying buttresses of the apse, "dont plusieurs étaient dégradés," were carried out. The troubled times of the year 1814 stopped the works at this point, and little was done till 1877, when the French Government granted the sum of 80,000*l.* for the works of restoration, since which time very much has been done, and those who knew it of old times are naturally anxious as to what the result of the expenditure will be; for, to ordinary observers, there was nothing, at all events on the exterior, which appeared to call for very much repair. It, however, seems from the architect's elaborate report, that some parts were in quite a dangerous condition, especially the flying buttresses, the great niches of the buttresses and their spires, and the parapets of the nave and much of the facing. The first works undertaken were, therefore, the repairs of these worst parts; they, of course, involved the construction of very elaborate and skilful scaffolding for the entire height externally, the stained glass of the clearstory being carefully covered up and boarded over where they are actually at work, producing a most singular and gloomy effect internally. Many of the westernmost bays are now completed, and the scaffolding removed, and one is much pleased not to be struck with such a sense of newness as might be anticipated. Much care seems to have been taken to preserve old work where sound, the mass of the wall and buttresses, therefore, fairly well retains its ancient tone of colour; but it is in the buttress-niches and their spires that new work makes itself specially evident. And here there is rather more done than some of us would consider quite justifiable; however, very many of the old stones of the canopies, capitals, &c., of the niches and carved bosses and gurgoyles are preserved on the pavement between the buttresses with permanent and picturesque small pent-house roofs constructed over them under the aisle-windows, resting on corbels let into the wall. Though this arrangement has a rather museum-like appearance, it enables one to test the accuracy and care which has been bestowed on the new work. I noticed many old moulded and carved stones marked and cut out for the insertion of new pieces, and that the great angels in the niches have, in many cases, had their ancient outspread wings refixed, the old fixing having been very bad; but I did not notice that any of the figures themselves were renewed.

The nave parapet and its pinnacles seem to have been in a very bad state, as they are almost entirely new. This ancient parapet was later than the clearstory wall, and certainly appeared to be no improvement to the earlier work; this defect is now more apparant through the almost white tone of the new stone. This stone seems to be of the same description as the old, and is a very hard limestone full of fossils.

The glorious west front, save for some new stones to the lower part of the tower-buttresses, is untouched, and long may it remain so. The area in front is still full of blocks of stone; but one misses the ancient stone lamp-posts, one of which I saw prostrate on the ground! It is to be hoped they will be re-erected.

Those who have examined the great side buttresses of the towers will remember the curious way in which Robert de Coucy or his successor altered the design (being obliged to reduce its cost) by making the projections of the buttresses less, just above the cornice of the aisles. It will be noticed that on the top slope of this cornice there were left curious square blocks, which Viollet-le-Duc writes, were described by Villars de Honnecourt thus:—"Les carniaux réservés sur la pente des larmiers pour permettre aux ouvriers de circuler autour des contreforts à l'extérieur." Viollet-le-Duc does not altogether accept this suggestion, but he does not explain why the blocks were so left. The problem is a very interesting one to attempt to solve when carefully examining the cathedral; it is, therefore, to be regretted that these old stones on the south buttresses are removed and new stones with similar square blocks inserted. But, on the buttresses of the north tower these blocks are not square, but are formed into small mouldings dying into the slope of the cornice, possibly indicating that the architect meant either to panel the face of the next stage of the buttresses, in continuation of the design of his intended aisle parapet, or that he meant to carry his parapet round the buttress, and by setting back all its faces to leave a clear passage round it, as was done at Limoges and Clermont. Whether the southern stones now removed were thus moulded or left square, I do not know, but if these northern stones are removed, the solution of this interesting problem will be impossible, as nothing can be inferred or proved from modern copies, however carefully executed.

In the interior, nothing is done, still the capitals look like butter (!), and there are in the niches and behind the triforium arcades, the hateful colour wash of greyish-blue. The cathedral would gain immensely by the removal of all this colour; but it is to be hoped that it will not have its stone joints pointed with the usual black mortar. The present altar, the screens, and all the fittings, are in the worst taste, and poor and mean in character, and ought to be entirely renewed, and, if possible, as they were before. In the Archbishop's Palace there is preserved a careful drawing of the very magnificent Flamboyant *jubé* erected in 1420, with its pair of circular open-work staircases. This was removed in order to gain a more spacious effect! I hope it may be possible that *this* splendid work of art may, at all events, be reproduced.

It is to be wished that it were possible to reproduce from authority the ancient fittings with the stone inclosures to the choir, probably in the style of the *jubé*, and in the style of those at Chartres; and also the ancient stone screens which shut off the apsidal chapels, and, above all, the magnificent ancient altar, which stood under the crossing, on the rich mosaic pavement brought there in 1791 from the destroyed abbey church of St. Nicaise. Most of the beautiful fittings were destroyed and replaced by wretched modern fittings in 1747 by M. Godinot, a canon of the cathedral. The removal of the mosaic maze on the nave-floor in 1779 is due to another canon, "qui était choqué des courses des enfans, et des étrangers qui s'amusaient quelquefois à parcourir pied à pied toutes les sinuosités et les contours de ce labyrinthe"!

Chartres Cathedral.

The works of restoration have been long in hand here, and up to the present time the exterior only has been dealt with, and that chiefly on the south side. The nave, with its aisles and buttresses, has been carefully repaired, and though there is a good deal of new stone, it seems to be introduced not more than was, perhaps, necessary. The south transept has been completed on its west and south-west fronts quite recently, and the scaffolding removed. Here much pains seem taken to replace only decayed work. This is especially to be noticed in the shafted buttresses, where a few stones here and there are put in, instead of renewing the whole length of the shafts. The great rose-window externally is entirely new, but it seems that the old stonework was in a most ruinous state, and only kept together by its iron bars. They seem to have taken the opportunity of the removal of this window to clean its old stained glass, for it has a more brilliant and transparent effect than I remember noticing on former visits. I do not, however, think the south clearstory or south aisle glass has been touched, as the stonework was in so good a state that it was not necessary to disturb the glass. The east side of this transept, the south-east tower, and the south choir aisle, are now hidden behind a mass of scaffolding; the windows are boarded up, and the works are just started. The south porch is left alone: though structurally like the northern porch, it really is in need of repair; but yet one would be sorry to see anything done, even though the great wooden props must still stand there. Some new finials are, however, being put on its pinnacles, but this seems the extent of what is to be done.

The interior greatly needs fittings worthy of the building, and the cleaning off of the thick coats of yellow wash and imitation porphyry (!) with which it is encrusted, and, above all, the removal of the horrible Classic casing of the choir arches and their piers. These abominations were executed in 1772 by the architect of the Duc d'Orleans, and at the same time the authorities barbarously destroyed the magnificent *jubé*, which is said to have been the original one, dating about the year 1030, and which, of course, must have been reconstructed in the new choir. It had seven arches, carried on monolith columns, and was ornamented with bas-reliefs, and had two staircases on each side, with "watch-lofts" for the guardians of the church. The present altar, erected 1773, involved the destruction of the ancient one of 1520, which is thus described:—"Environée de chaque côté de colonnes en cuivre surmontées d'anges de la même matière et couronnée d'une figure de la Sainte Vierge, en argent, monument dont comme de tant d'autres objets sacrifiés à la manie et la mode du jour, nous ne cesserons de déplorer la perte si importante à l'histoire de l'art dans le moyen age." When one reads how magnificent an effect the interior formerly presented, its present neglected and squalid state is the more to be regretted.

Most visitors to Chartres will remember the beautiful Early Gothic house on the south side of the Place of the cathedral, with its beautiful two-light windows in the first floor. This house has been restored (?) in the most grievous fashion, and its interest and beauty are gone for ever.

At Laon Cathedral the works are nearly completed, though the western end and the porch are still partially covered with scaffolding. It strikes one here that the work is almost entirely new, but whether that was necessary is doubtful. It is true the church was built very rapidly, and that there were partial failures in consequence, but the material used for the building generally is in such singularly good condition, that it is puzzling to account for the complete disappearance of the ancient west porch, and the parts adjoining it.

Valence Cathedral has been partially restored, and has a very beautiful modern Romanesque west tower, possibly to a great extent a reproduction of ancient work; the lower story, forming an open porch, is remarkably fine in its proportions and details. A portion of the west end of the nave and aisles has been rebuilt, and here a fatal mistake is made. The architect did not seem to appreciate how much the effect of the design depended on the manner of its construction, and he has used courses of ashlar and dressings of great height, instead of following the old thin courses and small dressings of the

ancient work: the result is deplorable. There is at Valence, as in so many French restorations, too much use made of black mortar in re-pointing the interior stonework: the result produced is one never intended by the designer, and there being no need to draw attention to the irregular sizes to which the stones are worked. For instance, at Valence the slender apsidal pillars are some of them carried up in numerous stones, only 10 in. or 1 ft. in height; others are in two or three stones only in the total height, but the architect never meant this to be pointed out in the emphatic manner in which the black pointing does it.

At Avignon, little or nothing is done to the cathedral in the way of restoration, but some unimportant works are going on at the Papal Palace, which will some day or other be disused as a barrack, and become a museum. At present much remains to be done. The magnificent Salle de Garde is so divided by floors and partitions that one has to go into very many rooms to get an idea of its magnificent dimensions. The interesting painted chapels open off barrack dormitories, but fortunately are kept locked; the frescoes are, however, terribly mutilated, and many of the heads of the figures have been cut out and removed to be framed and sold!

However, on the north side of the palace is a magnificent hall of early fourteenth-century date, under restoration; its great pointed barrel-vault is being for the most part reconstructed; the walls are supported by very massive buttresses, between which are thrown great pointed arches, leaving a space vertically next the wall for the purposes of defence; these arches are being rebuilt, and the old Roman system of carrying the centering is adopted by supporting it on a projecting course of stone of the arch itself, just above the horizontal courses which form its springing. At the Pont du Gard these projecting courses in the arches are left, but at Avignon they will be cut to the form of the arch when the centres are taken down.

The ancient city walls and towers, which still exist all round, are now almost entirely cleared of the houses built outside and against them, and are being restored, and their battlements and corbelling renewed where they had been destroyed. A boulevard is formed around the city, at the foot of these ancient walls, with most admirable effect.

Nimes.

The Cathedral of St. Castor is being almost entirely rebuilt excepting its very interesting Romanesque west front; the whole building was of that date, but had sustained such injury during the religious wars of the sixteenth and seventeenth centuries, and had been so modernised that it had become an utter wreck. The church is so entirely built round, with houses against its walls, that nothing but the west end is visible, and there are no open windows on its ground floor. In the fifteenth century, pointed groining was erected on the earlier walls of the nave, of fair detail and proportions; this groining has been very cleverly supported and retained in its place during the rebuilding of the walls under. The church has been reconstructed in its ancient Romanesque style; with a bold arcade, and triforium, consisting of four or five small semicircular arched openings, with a round-headed clearstory window over; the same design runs through the choir, which is not yet built to its full height. Most of the old aisle walls are retained, as they support the houses adjoining them; the eastern ambulatory walls are, however, new. There is in the choir a curious example of modern construction! The marble pillars of the triforium are very small in diameter, and the architect has feared to bring the weight of the clearstory upon them; he has, therefore, introduced a double cast-iron girder over them from pier to pier, to carry the superincumbent weight. The clearstory is built; but the triforium arcading, which apparently carries it, has yet to be filled in under the girders (see rough sketch). The groining of the choir will be on the old Romanesque lines; it is not yet constructed, but I examined the drawing (set out on the wall!) showing its design. This rebuilding is a most important work, and seems to be carried out with the greatest activity, and promises to be very successful. It used, indeed, to be a reproach to Nimes that its cathedral was so ill cared for, when it had three great modern churches on a still larger scale. As regards these churches, two are very pretentious and costly, and utterly uninteresting; but another, dedicated to St. Paul, built in 1850 by M. Questal in the Romanesque style, is worthy of the highest praise for its refined architecture and for its magnificent paintings by Flandrin.

Lyons,—St. Martin d'Ainay.

The Church of St. Martin d'Ainay was the most remarkable church in Lyons by reason not only of its great antiquity, but also for its beautiful proportions; the earliest portions date from the ninth century, and there are used in its construction granite columns of great size taken from some Pagan building. The style is the Early Romanesque of the district, and of beautiful detail; the western tower is Carlovingian, of admirable design. Its plan consists of nave and shallow transepts, and choir, with an octagonal domed lantern over the crossing; the aisles are narrow, and end in apsidal chapels east of the transept. The restoration and enlargement of this church is much to be deplored; the architect has entirely ruined its proportions externally and internally; he has added great aisles on each side (see plan), cutting through the ancient aisle walls. This extra width, of course, would have darkened the church (the nave having a barrel-vault without a clearstory), so he raised the old aisle walls and added a clearstory to them, and continued up the wall pilasters considerably above the level where the cross arches sprang. These heightened aisles were then continued on to the west front, with new doorways, the effect being to dwarf and ruin the proportions of the old tower. The eastern chapels, fortunately, are not raised, and here the charming relative proportions of choir, lantern, and aisles can be seen and enjoyed. The modern aisles have semicircular-headed windows, &c., imitating the tower, and they are carried out in a costly and most substantial manner; but such a church should never have been enlarged, and no architect should have attempted it: success was not possible, as the old building was quite perfect in its proportions.

Limoges and Clermont-Ferrand Cathedrals.

The new works at the cathedrals of Limoges and Clermont-Ferrand are of peculiar interest and importance, for both are now being completed after the suspension of building operations for four centuries. Both cathedrals are on the site of Romanesque buildings, and both were commenced to be rebuilt in the Northern-Gothic style in the thirteenth century, and (as Viollet-le-Duc points out) on the same general plan, and most probably under the same architect's directions. In each case the choir (and at Clermont three bays of the nave) were completed in the Middle Pointed style. At Limoges the transept and two bays of the nave were proceeded with and completed, and the lower portions of two more were commenced, in the fifteenth century; while, at the same time at Clermont, a portion of another bay of the south aisle was erected. The works then were stayed at each church, leaving standing portions at the west end and the towers of the Romanesque churches.

The works now in hand follow more or less the ancient lines. Viollet-le-Duc gives plans of each, showing exactly what was originally carried out, and he indicates further the supposed original intention of the architect. I was much interested in examining the new works and comparing them with these plans, and I find some important variations from them; while, however, on the whole, they represent fairly well the new work done.

At Limoges the three western bays are in course of erection, including the aisles and chapels, and these seem to be faithful reproductions of the ancient work; but, on reference to page 374 of the "Dictionnaire," it will be noticed that Viollet-le-Duc shows on his plan one bay of the nave and aisles of the Romanesque church as existing; and in a foot-note he explains it thus:—"On a laissé subsister un débris le l'ancienne nef romaine et les soubassements de la tour de XIe siècle, renforcés et surélevés au XIIIe et au XIVe siècle"; but this bay of the nave, unfortunately, has been entirely pulled down, and a porch has been designed by the architect (as indicated in my plan) between the nave and the tower. He has arranged this with a view to get over the difference of the centre lines of the tower and the nave, and when viewed internally the result is fairly successful and picturesque. The porch is vaulted at the same height as the aisles, but it is not yet sufficiently advanced to enable one to see how the upper part will be treated, and whether or not it will be made an organ-gallery by continuing the triforium and clearstory up to the tower, and so give the same number of bays as at Clermont, which the original architect probably intended to do. The external effect of this porch is, however, most inharmonious, and has singularly ugly doorways, with square lintel-heads, carrying the upper part of a four-light window, giving the effect of the window having been cut down to form the doorway, and its tracery supported by a girder! These doorways are a most serious blot on the work; but, in other cases, the ancient details, and even the heights of the courses, are scrupulously adhered to.

The progress of the works has been rather slow since the recommencement. The first and second bays (on each side) next to the old work are built as high as the cill of the clearstory; and the next bay and the west wall as high as the string under the triforium. The aisles are vaulted, and the windows formed, but are yet without tracery or mullions. A light-coloured granite is used, like the ancient material, which has now weathered to a dark brown tint. Very little scaffolding is being used, much of the work being fixed by men standing on the walls themselves. While there is so much to praise in the new works, one regrets the destruction of the Romanesque fragment, and the substitution for it of the not particularly successful porch.

There is a point in Viollet-le-Duc's plan to which I will just draw attention. He does not show on it the singular thickening and strengthening of the walls of the Romanesque belfry referred to in this footnote, so I have indicated this in my plan. The original porch and bell-tower was on the usual Romanesque Auvergne type, and had thin walls, with openings, and four central columns, resembling the belfries at Le Puy-en-Velay and at S. Benoit-sur-Loire. It was, however, incapable of supporting the great tower which was erected over it in the fourteenth century. The architect of that day, therefore, built up the centre, and thickened the external walls, so as to get a solid mass on which to start his tower safely: the result is singularly heavy and ugly, and hopelessly ruins the western view, and gives but a narrow and tortuous entrance to the church.

And now as regards the works at Clermont. They are very much more advanced; the new portion of the nave, aisles, and chapels are completed, and are opened into the ancient church. Here the old details have also been carefully followed in all respects, and the result is most satisfactory, giving its due effect and proportions to the very beautiful original design. The apse, and its surrounding chapels, of this cathedral, with the magnificent stained glass, combined with the dark tone of the lava of which the whole is built, are to my mind almost unequalled in beauty, except, perhaps, by the glorious apse of Barcelona Cathedral.

But with regard to the west end, there seem variations from M. Viollet-le-Duc's plan (they are executed as shown in my plan), but the western towers are puzzling. He speaks of the ancient Romanesque west end and towers thus: "On voit encore les restes de la façade du XIe siècle"; and he goes on to say in a foot-note,—"Deux tours qui subsistaient encore sur cette façade, mais qui avaient été dénaturées depuis longtemps, ont dû être démolies parce qu'elles menaçaient de s'écrouler." This front was pulled down in 1855, and a new front and towers erected in the thirteenth-century style designed by M. Mallay, as shown on the plan given by Viollet-le-Duc. The spires are now being commenced, and the effect on the whole promises to be very good; but unfortunately the lower story of the towers, both inside and outside, are exceedingly poor in detail and effect. The space is cut up into passages and steps, and is very different in effect to the lower stories of the Cologne towers, the plan of which is here imitated on a small scale. One much regrets that the ancient Romanesque towers were not strengthened and restored.

The new works are all carried out in lava, but of a somewhat lighter tone than used in the old work. It is a material of great strength, and wears remarkably well. The ancient work is, therefore, in an almost perfect state. Its whole construction is exceedingly slight, yet the wonderful skill and knowledge of proportion shown in its design is most remarkable.

The Roman Antiquities of Orange, Arles, and Nimes.

The restoration of Roman remains is ques-

tionable from an historical and artistic point of view, and really only to be defended, when it is adopted as a measure of precaution for the purpose of preserving these buildings for posterity to study, and I was, therefore, glad to find that (excepting, perhaps, some rather superfluous new work in the amphitheatre at Nimes) the works of restoration have been, and are now, carried out in a most judicious and careful manner. At Orange the very beautiful triumphal arch was taken in hand some years ago; it had been built into a palace of the Princes of Orange, but this building has now entirely disappeared, and the arch stands in a clear open space across the main north road to Valence; the southern face and its engaged columns, including portions of the pier of the small side archway have been rebuilt, and blocks of stone inserted where the old stone had been cut away; the mouldings are wisely carried on in the new work so as not to needlessly break the ancient lines and profiles, but no carving or enrichments of mouldings are executed, so the new work preserves the old from further decay, and in no way professes to imitate it, while at the same time it gives additional value to the ancient work by enabling its proportions and design to be fully appreciated.

The top of the great wall, which forms the "scena" of the Theatre of Orange, is now being repaired. The whole had much bulged in its length, and had lost most of its coping, and portions of the upper courses, especially on the slopes of the wing walls; these are being rebuilt and a new coping put on, copied from the old, portions of which are suffered to remain *in situ*, so that the accuracy of the restoration is guaranteed. Nothing else is to be done, and the great wall, with its interesting doorways, recesses, and niches, is left untouched.

At Arles the amphitheatre has not had much done to it beyond repairs to the ancient steps, and the replacing of some of the outer piers and arches,—this last, possibly, from necessity; for I saw an old print showing the interior filled with houses, which were also built up and into the recesses of the arches. The three great towers raised on the upper series of arches, when the whole was one vast fortification in the eighth or ninth century, are carefully preserved and repaired; of course, they are incongruous, as was the old Venetian tower on the Acropolis at Athens, lately pulled down, but they are part of its history, and are as such valuable; the details of their windows, &c., are, moreover, very good.

The theatre of Arles is being gradually brought to view by pulling down the houses which formerly covered nearly all its area; most of it is now exposed, and on the foundations and remains of the piers there is in course of construction the outer semicircle of open arches, copied from some old ones which exist; these will form a bounding line to the ruins, and in no way interfere with its great archæological and architectural interest.

It is at the great amphitheatre of Nimes that the most important restorations and additions have been carried out. It underwent the same vicissitudes as that at Arles, and like the Colosseum at Rome it was converted into a fortress by the Visigoths, and was in 1100 held by Knights called "*Milites castri arenarum*," who constructed their houses within it; but at the end of the fourteenth century the knights having left, the people took possession of it, and its area gradually got completely filled up with mean houses. In the early years of this century the restoration was begun by clearing out the area and pulling down all the houses built up to the exterior, and up to the last few years the works have been continued. As at Arles the towers and alterations of the Visigoths are not disturbed, and the arena has been lowered to its ancient level, showing the marble-faced podium. The lower division of four rows of seats was found nearly perfect, and also six rows out of the ten of the second division; but the twenty rows of the third and fourth divisions were almost totally destroyed, with the arched passages and "vormitoria" under them; small portions of these have been re-constructed (without interfering with the general effect), with a view to explain the original design of the building. Some persons may say that this is going too far, but I can say that it adds vastly to one's interest when endeavouring to understand this magnificent building. Portions of the exterior have been restored and re-faced, and here there is, I think, more work done than was necessary for strict "conservation"; moreover, the detail is very poor, and the new white stone brings it out in rather painful prominence.

A most interesting and learned history and description of the building has been written by the late M. Auguste Pelet, of Nimes (and published in 1866); he so thoroughly enters into the question of what a "restoration" should and should not mean that I will venture to quote some remarks of his on the subject:—"Malheureusement on s'est un peu trop éloigné du but qu'on s'était d'abord proposé dans les réparations projétées; on voulait seulement conserver et l'on a crée. On aurait dû traiter ce colosse avec tous les égards dûs à son antique origine; il fallait guérir ses blessures et respecter ses cicatrices, dont chacune était une page de notre histoire. Nous n'aurions pas, il est vrai, une galérie toute neuve, des pilastres à vises arêtes, des moulures ciselées avec soin, des chapes éblouissantes de blancheur pour garantir des constructions modernes, des murs qui dénaturent le monument; mais en revanche, les tours des Visigoths existeraient encore, l'on verrait des arceaux croulant en apparence, mais solides, des arêtes écornées par le temps ou les Vandales, des fragments de voûtes noircis ou couverts de mousse, et cette belle ruine n'aurait rien perdu de son caractère, de son éloquence, et de sa poésie." R. Herbert Carpenter.

NEW PREMISES FOR MESSRS. J. FIELDUS, SON, & CO., QUEEN'S ROAD, BRIGHTON.

These premises have been erected for Messrs. Fieldus & Co., from the designs and under the superintendence of Messrs. Lainson & Son, architects.

The frontage to the Queen's-road is 41 ft. 6 in., with a depth of 150 ft. The total floor-space is 26,000 superficial feet, and the cubical contents about 500,000 ft. The style is that of the French Renaissance. The main walling is of red brick; the dressings partly of Aberdeen granite, but mainly of terra cotta from the Tamar Terra-Cotta Company. Wood and glass form conspicuous features in the design.

CHAPEL OF THE CONSTABLE IN BURGOS CATHEDRAL.

Burgos is a proud, a royal, city; she is an epic dating from the most brilliant time of Spain, and still preserves in her ruins a trait of nobility and grandeur which time has been unable to efface. The architecture of Burgos has less of the Eastern character than Toledo or Cordova, and the city remained a shorter time in the hands of the Moors; she was, on the contrary, the stronghold of the Gothic kings, the city of the sainted Ferdinand, of the proud Alfonso, the home of the incomparable Cid. Everything which Burgos possesses of beautiful buildings is overshadowed and eclipsed by the majesty of the cathedral. This dates from the thirteenth century, from the time of Ferdinand, and was erected on the site formerly occupied by the king's palace. The outcrop of pinnacles, which in Milan Cathedral appears almost overdone, as an excess of Southern fancy, has here been restricted within bounds; what in Northern cathedrals might look abstract and naked is here still the pure expression of original ideas, of that powerful devotion which turned kings into Crusaders and made artists the anointed of the Lord. The principal portal, which must have been originally very rich in execution, is partly destroyed and clumsily restored; the rose-window, however, and the double windows over it, are of considerable beauty; and the two principal towers, of a height of 300 ft., have withstood the ravages of time very well, notwithstanding their open work and extremely fragile carving. The octagon tower over the cross into which the cupola of the cathedral rises is surrounded again by turrets rising from the roof, and over the side portals a bundle of eight slender openwork turrets. The tower of the chapel which joins immediately on to the choir of the cathedral has a very similar effect, and altogether the total impression produced is very striking. The interior of Burgos Cathedral corresponds in a high degree with its exterior. The light comes in through stained-glass windows, and produces now and then magical effects of colour. The ornamentation of the interior presents the best which sculpture and painting of the epoch could provide; celebrated names are represented, and every succeeding century added treasures to those already deposited.

Numerous chapels surround the nave of the church, of which the most splendid, if not the most to be admired, is the "Capilla del Condestabel," in the late style of the fifteenth century. It is behind the high altar, and contains the graves of the Velasco family, and especially that of the founder of the chapel, the Constable of Castile, and of his wife, in marble. The sculptures of the chapel, which are ascribed to Juan de Borgogne, represent the Crucifixion, the Resurrection, and the Ascension. By the side of the statues lies a large block of jasper. Coats-of-arms and supporters adorn the walls of the chapel, which is shut off by a heavy iron railing, over which stands the equestrian statue of the Apostle James, a work of Cristobal de Andino, a native of Burgos.

BOGNOR ROMAN CATHOLIC CHURCH AND MONASTERY.

A new mission has been started at Bognor by the Servite Monks, or "Servants of Mary," from their head house in England, St. Mary's Priory, in the Fulham-road, West Brompton, and the first stone was laid on the 26th of October, by the Rev. Canon Butt, of Arundel, who officiated in the place of Cardinal Manning, unavoidably prevented from attending at the last moment. A large gathering of friends came from London and parts near to Bognor.

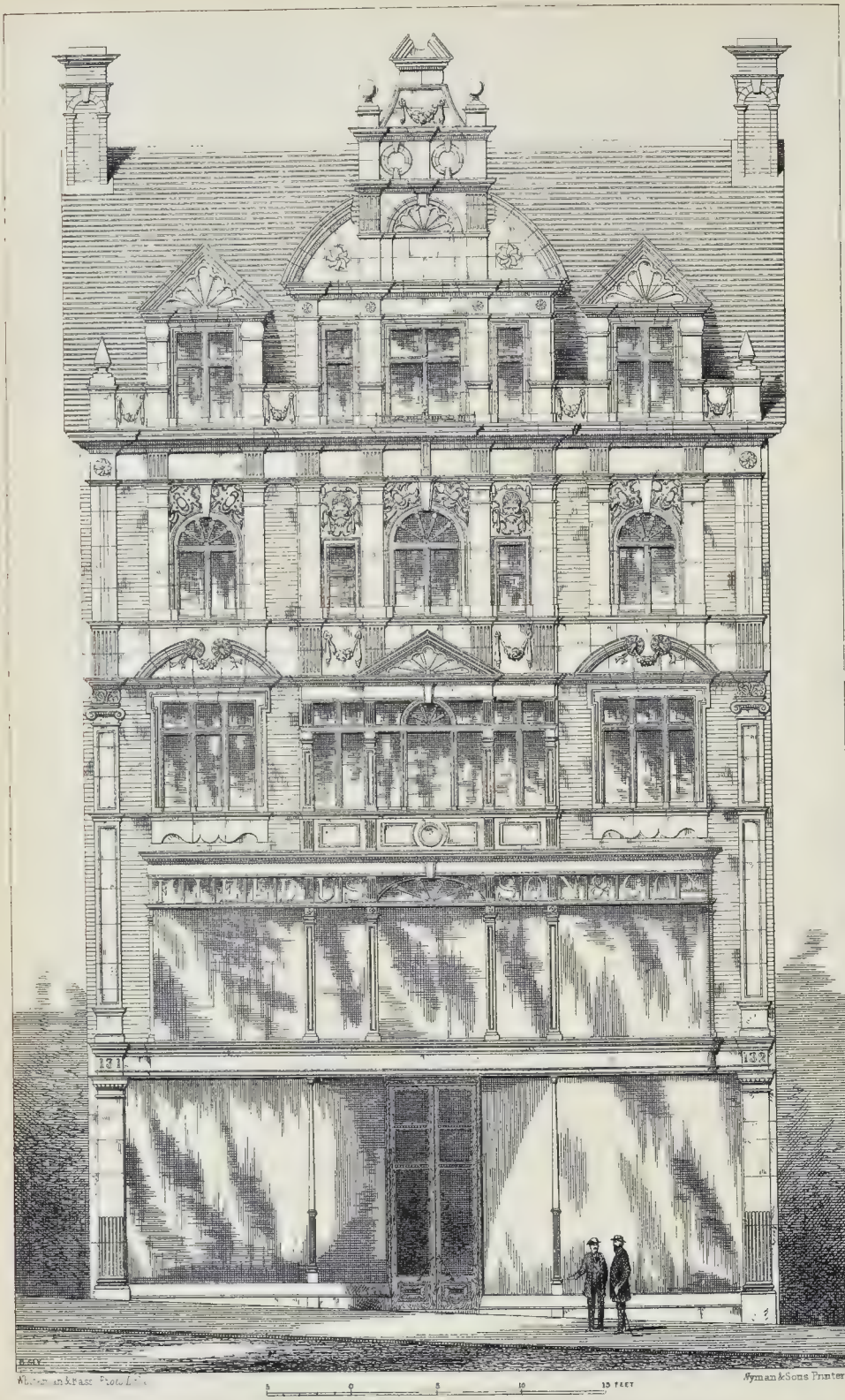
The part of the church now building consists of five bays. A peculiarity of the church is that there are no aisles, but recesses used for chapels, confessionals, and a baptistery are substituted. The nave (till extension) will be 76 ft. long and 38 ft. span. The material used is brick with Westwood ground stone dressings, from the quarries of Messrs. Randell & Saunders at Corsham. The style is Early English, of simple but bold treatment. The façade we need not refer to, as it will be seen in our view this week. It will be necessary, however, to explain that windows are not shown in the gables of the side chapels, as, this being the limit of the ground, they would be liable to be blocked out by adjacent buildings at some future time. In the recesses from the outside, however, light is obtained by treble lancet lights in the nave, and double lancets in the chapels.

The monastery is to contain, in the basement, kitchen, scullery, three store-rooms, larder, wine-cellar, lay brothers' rooms, and other accessories. The ground-floor will have two reception rooms, outside the cloister enclosure, of which one side only is to be built at present. Inside the enclosure will be the refectory, 26 ft. 6 in. by 17 ft. 9 in., and 12 ft. 6 in. high. On the two upper floors are to be a community room and thirteen cells.

Both the church and monastery are capable of considerable increase, ample ground having been procured, shaped letter T, 345 ft. across the arms, 125 ft. at the foot, which the new buildings are to occupy, and 222 ft. high. There are frontages to four roads.

The architect is Mr. Joseph Stanislaus Hansom, of South Kensington, and the builder Mr. George Huey, of Parkstone, Dorset. 6,000*l.* are to be spent on this the first instalment of the buildings, which are to be completed by September, 1882.

Strikes in France.—As the carpenters' strike continues in Paris, the masters are obtaining hands from abroad. The *Standard* says,—"On Thursday no fewer than 900 men arrived from Belgium, 250 from Switzerland, 200 from England, and 200 from Italy, who at once found work. On Friday a further detachment of 300 reached Paris from Brussels, Antwerp, and Liège; some 200 are expected before the close of the week from Switzerland, and an equal number from the north of Spain. Thus a total of some 2,000 foreign carpenters will next week be earning their bread in the French capital. Under these circumstances it is to be feared that the native workmen will have reason bitterly to repent the step they have taken. In view of the number of strikes now existing in various trades, the French Academy of Moral and Political Science has offered a prize of 5,000 francs for the best essay on "The Effects of Coalitions and Strikes." Competitors are directed to trace the movement in the rates of wages in trades from which strikes have been absent, and in those in which they are of frequent occurrence."

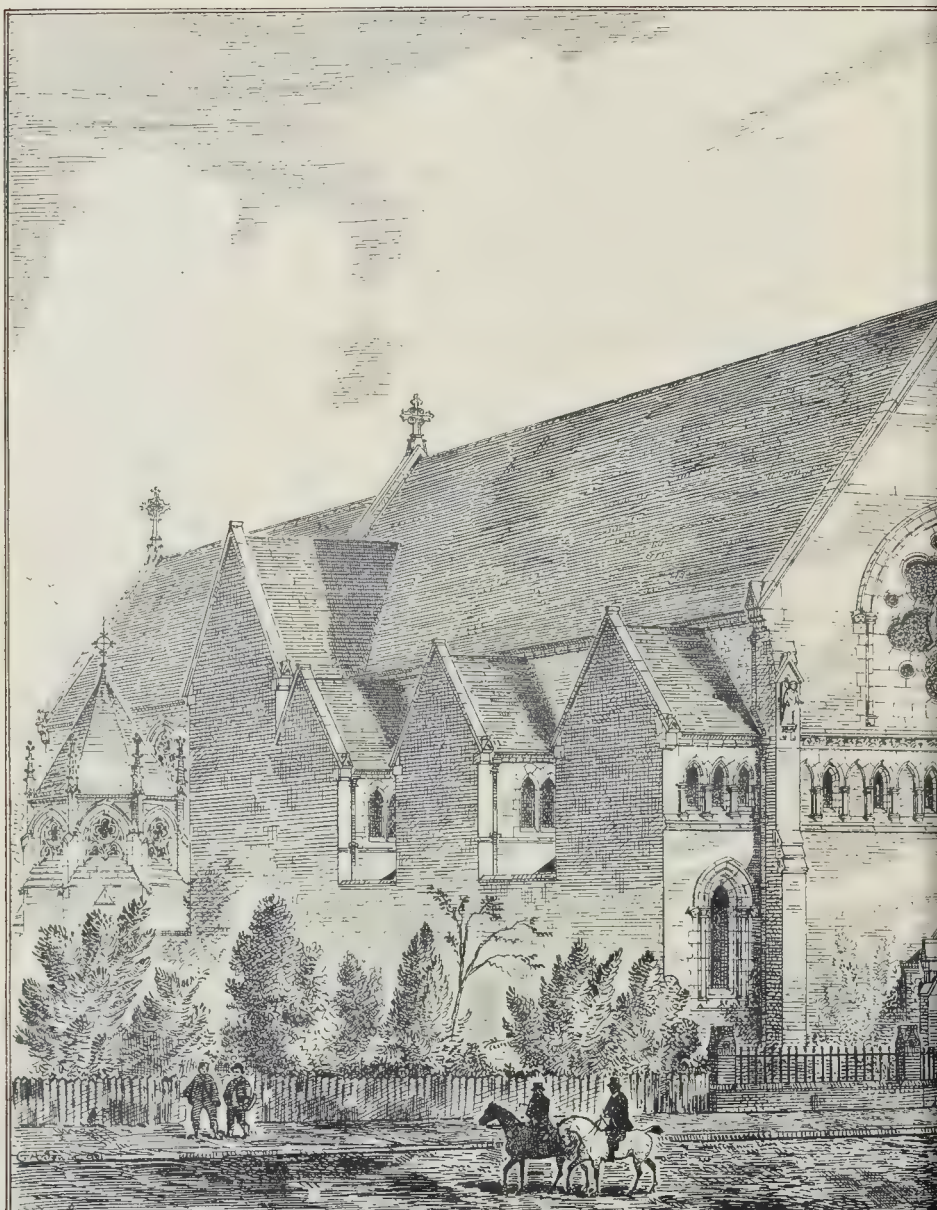


Alabaster & Grace Photo Lith.

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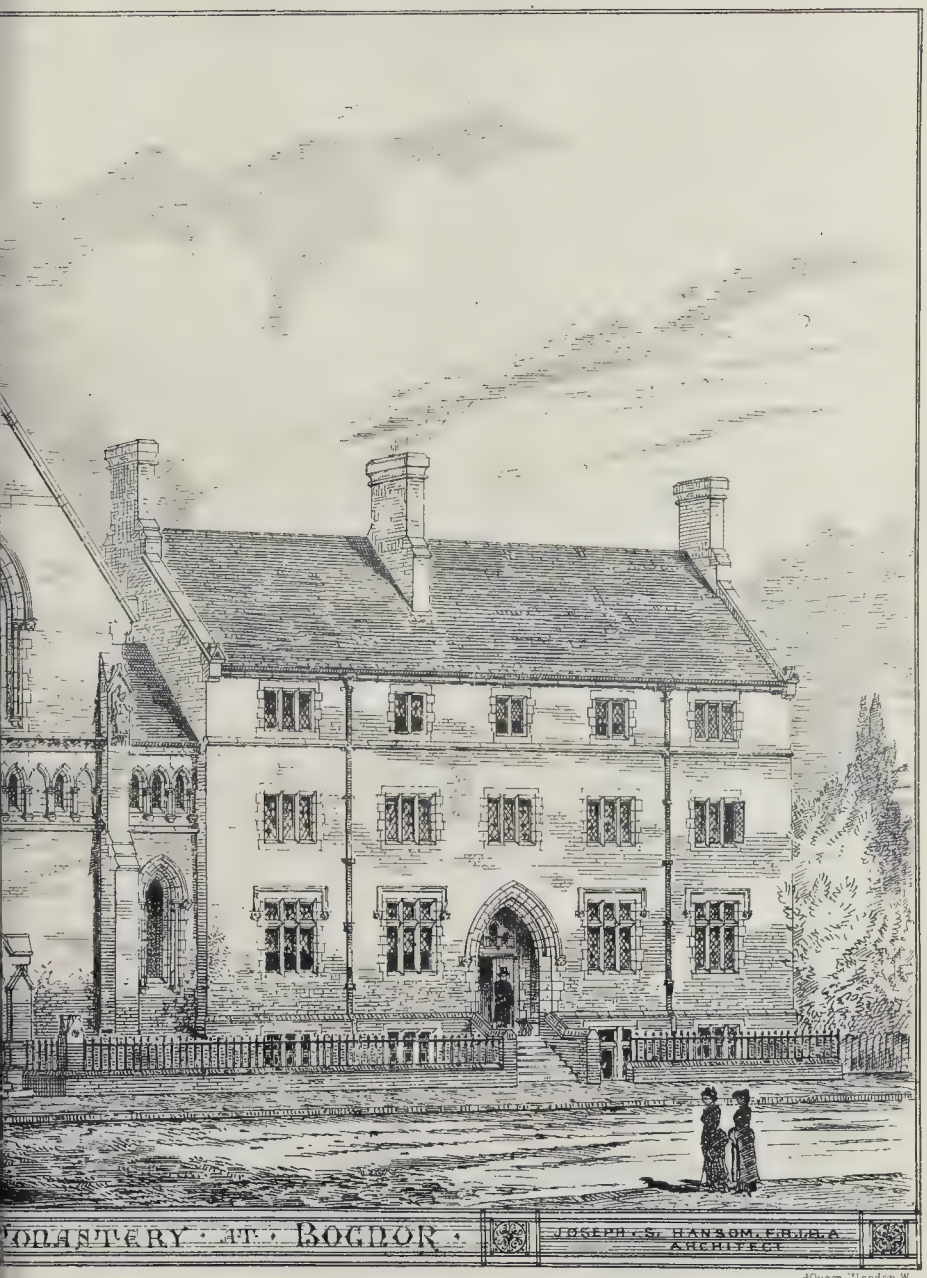
BRIGHTON STREET ARCHITECTURE: NEW BUSINESS PREMISES, QUEEN'S ROAD.

MESSRS. LAINSON & SON, ARCHITECTS.



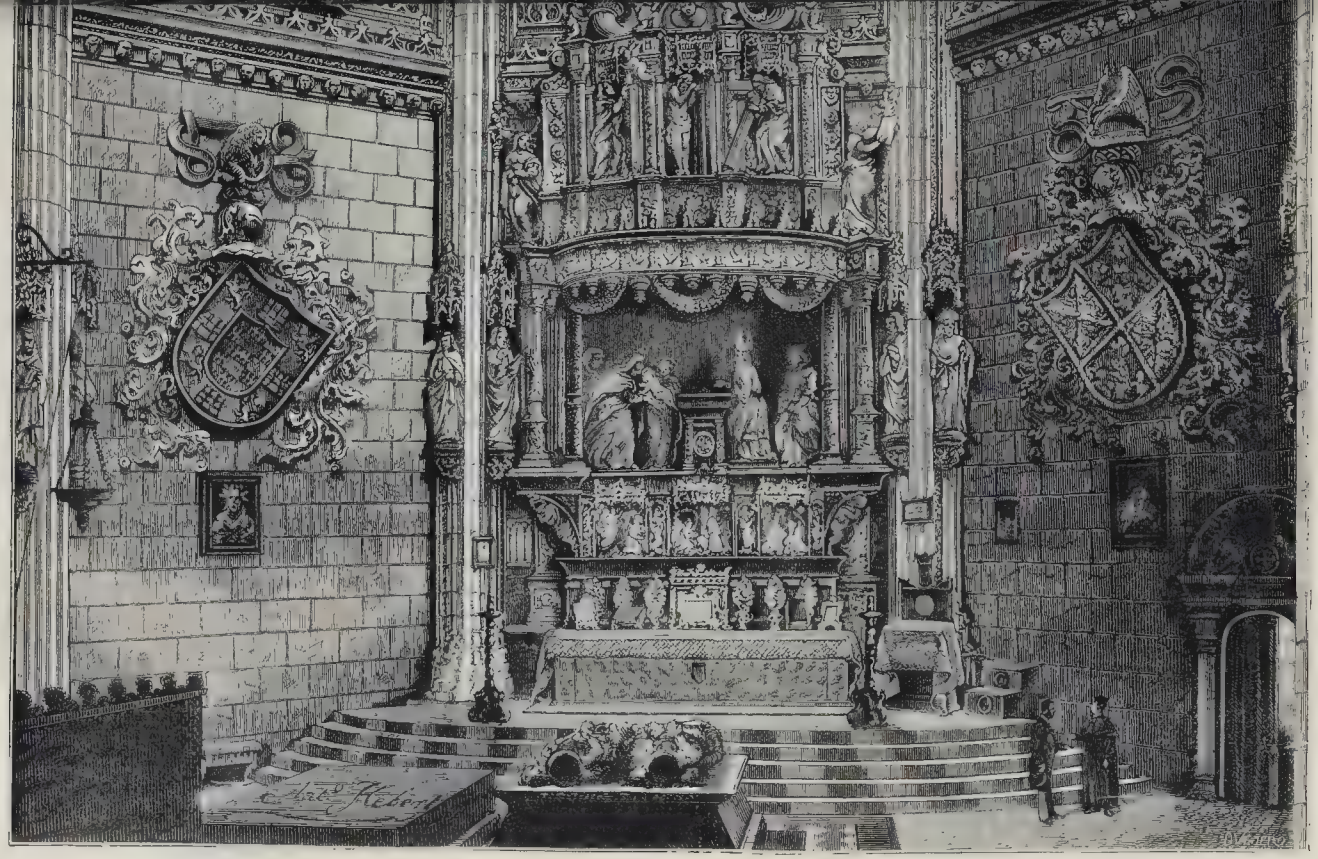
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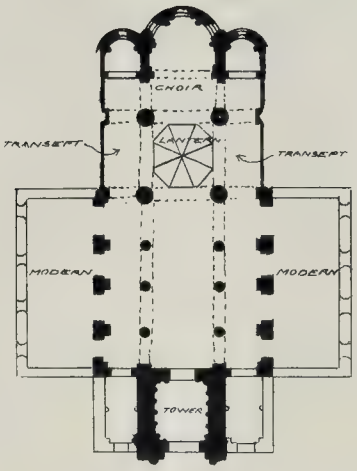


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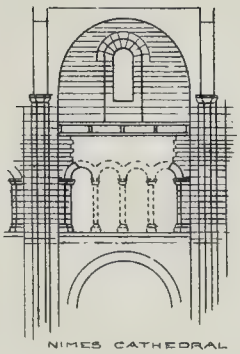




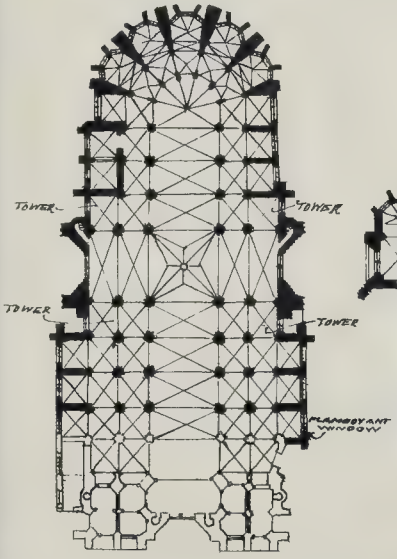
BURGOS CATHEDRAL: INTERIOR OF THE CHAPEL OF THE CONSTABLE.



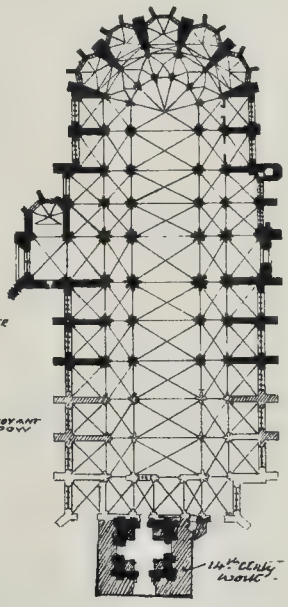
S MARTIN D'AINAY
LYONS
SKETCH PLAN (NO SCALE)



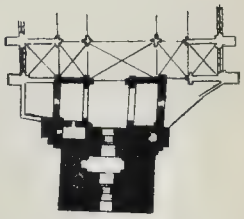
NIMES CATHEDRAL
SKETCH SHOWING IRON GIRDER CONSTRUCTION



CLERMONT CATHEDRAL
SHEWING THE NEW WORKS OF COMPLETION



LIMOGES CATHEDRAL
SHEWING THE NEW WORKS OF COMPLETION



PLAN OF TOWER
FROM M. VIOLLET-LE-DUC

NOTE - THE PORTIONS SHADED [///] STOOD 6 TO 10 FEET HIGH.

eman & Bass, *Photo-Litho* 236, High Holborn

Wyman & Sons, Printers G^t Queen S^t

PLANS OF EDIFICES ILLUSTRATING "RESTORATION WORKS IN FRANCE."

THE PRESIDENT'S ADDRESS AT THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.*

The losses which we have sustained during the year will be duly chronicled in our Transactions, and a few words will suffice in addition to what is doing upon some of the names whose absence from our ranks we deplore. The death of William Burges took from us, unexpectedly and in his full vigour, one whose belief in his art, whose devotion to its study, whose enthusiasm for his work, have rarely been excelled. A student from first to last, an artist whose hand was always seen in every detail of his work, his example is one to be held up always for our admiration and emulation. He knew that unless an architect's work is good and thorough it has no enduring life. He knew that this lesson required to be taught us more than any other, and he made it the business of his life to teach it, and I honour him the more that he gave to others what he had with infinite pains learnt. It was one of his greatest pleasures always to discuss, in public or in private, old modes of procedure, of manufacture, of design. There was nothing selfish in his acquisition of architectural or archæological information. He was as ready to communicate as he was to acquire, and many of his published papers are replete with learning and information. The study of Early French Pointed architecture had evidently produced a very strong and lasting effect upon him as an artist. He revelled in the somewhat rude and ponderous version of it which he affected, and it was in the sculpture and the decoration with which he rejoiced to overlay his work that he allowed his quaint and exuberant fancy to have full play. There was so much originality in what Burges did that his work was certain to be criticised. It was warmly admired and as warmly opposed, and he would have been the last man to wish it otherwise. In one thing at least all were agreed, and this was that his death was a real loss to our art. The Royal Academy had at last recognised his undoubted claims, and, unfortunately it still remained for this Institute to follow with a testimony in the shape of the gold medal, the bestowal of which, I am sure, could not have been much longer postponed. In Frederic Ouvry we have lost an adviser, who was not only always ready to give us his valuable counsel whenever we asked for it, but we had the satisfaction of seeing combined in him the able solicitor and the accomplished antiquary. For the greater part of his life he had been an active member of the Society of Antiquaries, of which he was for many years treasurer, then vice-president, and finally president, after the death of Lord Stanhope. Among foreign architects whose deaths we have to deplore are some of great mark. Hector Lefuel, member of the Institute of France, was well known by his works to many of us. The names of Davioud and of Mariette Pasha must not be forgotten. Both of these did great work in different directions, and will long be remembered among us, the former especially by what certainly was a bold flight of genius,—the Trocadéro building,—and the latter by his good work among the monuments of Egypt. Time will not allow of my mentioning other less well-known names, or those of men whose life was less intimately bound up with our own work here.

The architectural publications of the year do not appear to be numerous. I cannot say how much I regret this. Nothing in my opinion tends more to raise our art than some attention among us to these literary illustrations of architectural history and style in which so many architects have in past times distinguished themselves. We have examples in the case of some of our oldest members which may well be commended to the notice of their juniors. Nothing, let me assure them, so certainly gives young men their first footing on the ladder which leads to fame and success. Our old librarian, Mr. Dollman, has shown us how valuable a work it is possible to produce in his monograph of St. Mary Overie's Church, as to which I have already had great pleasure in expressing my opinion here. The Society of Dilettanti has published another part of the antiquities of Ionia, in which, seeing that Mr. Newton, Mr. Watkiss Lloyd, Mr. Fergusson, and Mr. Pullan, have combined their forces, we need not doubt the result. The magnificent Government work, the "Monumentos Arquitectonicos de España" is still going on, and we are looking forward to the early publication of Herr Richter's promised edition of Leonardo's "Trattato della Pittura," a work which will have almost as much attraction for architects as for painters, for among the many hitherto unpublished drawings which will be contained in it, many, I understand, are architectural designs. No great public works have, I think, been completed during the year. At Vienna, at Brussels, and in Paris, great works are approaching completion, all of them undertaken in a spirit of lavish expenditure, which is somewhat surprising to us in this country. The cathedral at Cologne has been completed,—the most gigantic work of modern times,—in presence of which all unkind criticism ought to be hushed in admiration of the grandeur of the idea. The so-called "restoration" of St. Mark's, Venice, has I hope, for a time, been arrested,—whether permanently or not it is impossible to say. Only too frequently works are done for which the necessity, if it exists, cannot but be deplored. Such a case is that of Coutances Cathedral, where the north-west steeple has been made to look as it might have done, when first built, by the obliteration of every mark of age. I most sincerely trust that this may not be the forerunner of an entire scraping of the whole of this magnificent church. The question of the restoration of ancient buildings is one which is constantly coming up for consideration, and I am constrained to say, that unless the very greatest care and judgment, and the utmost reverence for every relic, actuate the restorer, restoration is not only a serious risk, but an unmitigated evil. There is the risk of doing too much and of obliterating every sign of antiquity. Such works in our own country as the redecoration of the Chapter-house at Salisbury; or in Germany, such works as the decoration of the castle at Meissen, and the far more interesting castle on the Wartburg near Eisenach; or in France, such as the re-decoration of the interior of the Sainte Chapelle, fill me, I confess, with distress. No one wishes more than I do to see our painters at work upon our walls; but I do not wish to see their works obliterating, as they do at the Wartburg, every mark of antiquity inside the building. Our new walls and buildings are numerous enough for all that they can do; and in the repair of old work, it is the repair, strictly speaking, that is the one thing needful, and beyond which it is undesirable to go. And even this ought never to be treated as proper work for any but the most skilled hands.

For the coming year I hope that subjects will be found, both for discussion and for illustration, at our meetings, which may enable us to leave at least as good a record as heretofore. I cannot but think that it is not creditable that our committee should have so much difficulty in persuading members to read papers. If you look through the past volumes of our Transactions, and then at the best known names in our lists, you will find, I fear, that many who must have matter well worth communicating, have never yet troubled themselves to make a single communication to the Institute. It ought not to be possible for me to say this.

Various matters of considerable practical interest will come before you this Session. The proposed repetition of the Electrical Exhibition is one which will be full of interest to those who have not made it their business to visit Paris during the exhibition there. And hardly second to this in its interest for architects is the Smoke Prevention Exhibition, which is to take place this month and next at South Kensington. There is small encouragement in London to use the best materials for building, if they are to be defiled as soon as built by the foul atmosphere which we create for ourselves; and our utmost endeavours ought to be given to the cause both of clean lighting and clean warming, if we have any care whatever for the permanent effect of our buildings, both internally and externally. Among other subjects which I hope your Council will see their way to bring before you, are suggestions for the consolidation of the Building Acts for the whole country in one uniform Act; and the preparation of such a statement on the subject of the law of light and easements as may help to form the basis of an Act of Parliament to do away with the present uncertainty and variety of opinion and practice; and the Council will no doubt feel it necessary to bring before you some amendment on the present mode of electing to the highest office in our body.

Her Majesty's Gold Medal was given last year to Mr. J. L. Pearson, and this year to Mr. Godwin. Next year, according to the established custom, it will be given to a foreigner. On these occasions, when foreigners are elected, it is generally of necessity given to one who has no connexion with this Institute, and I do not hesitate to say that if we saw fit when the man exists in our own profession, but outside our own ranks, we should both better obey the Queen's intention and gain more credit than if we insist upon regarding membership of this Institute as a preliminary condition for British membership, which is what hitherto, I believe, we have practically done.

The most serious matter before us for next year is the first Obligatory Examination for admission to the privilege of membership. It would be strange, indeed, if in a land of freedom such as ours there had been but one opinion as to the wisdom of the proposal, but it would be almost equally strange if, in a land of order such as ours fortunately is also, the examinations were not carried out with due zeal and thoroughness by your executive. Some of us may think old times were not so very bad, and that want of some small preliminary technical culture and education did not prevent many of our British architects from being really great men. But these are not the sort of men who will be affected by our examination, the object of which is rather to raise the general standard of education, and so to keep out of the Institute those who are wholly incompetent, than any vain hope of suddenly creating an unlimited supply of admirable artists. We must not raise our expectations too high, or we shall certainly be disappointed. At the same time I feel very decidedly that it is the duty of the Institute to take care that the examination is a *bonâ fide* one, involving careful preparation on the part of the candidates, and a real acquaintance with at least the groundwork of an artistic and a professional knowledge. It is obvious that there will be no difficulty in testing satisfactorily the ability of those who come to be examined in many of those branches of our work in which every one who intends to act as an architect ought to be well grounded. The power of drawing accurately and intelligibly plans for buildings which will stand when built, is a *sine quâ non*; and there is much work of this sort as to which we shall have no difficulty in framing sufficient tests. The far more real difficulty is in an examination into the capacity of candidates as artists; and here I feel that it will not be desirable to make the test very difficult, for I know well under what difficulties students often labour. As a visitor and teacher for some years in the schools of the Royal Academy, where probably owing to the examination at admission the ability of the students is above the average, I have to see with constant regret a singular want of acquaintance with the first principles of architectural design, and with the rudiments of architectural detail, which mark the work of many students. But I hope all here will agree with me that it would be a fatal mistake to make the artistic part of our Obligatory Examination so very easy and rudimentary as to allow of even the most ignorant of our candidates scraping through. The examination once instituted must be a real one, in the sense of meaning that the candidate has at least reached some fixed standard,—even if a rather low one,—of efficiency all round. My own opinion is that such a standard should, as far as possible, be so settled at first as to remain permanently the same. We are not likely, so far as I can judge, to have a better prepared class five years hence than we have now. All the necessary means of education exist now, and have long existed. The system of pupilage, which enables men to learn exactly how those who have succeeded in making their mark are in the habit of working, is no doubt the strong point of our English system; and this can be supplemented by work in London under the professors at King's College and University College, and both in London and the provinces under the Government teachers. Then there is the Architectural School of the Royal Academy, presided over by an active member of our Institute, and where the students have the advantage,—as from the crowded state of the school there can be no doubt they feel it,—of the personal teaching and direction of most of the architect members of the Academy in succession. Finally, there are the inducements held out, both here and at the Royal Academy, to the more able and earnest art-students, in the shape of prizes more or less attractive, and only to be gained by those who

* Continued from p. 598, *ante*.

have achieved considerable artistic excellence. No one can fail to be struck with the high average of the work which is done in competition for the medals and prizes which we annually distribute; whilst at the Academy, though the excellence of the competition has been for many years very remarkable, I am sanguine that the alterations which have just been made in our laws, with, among other things, the provision of a travelling studentship of 200*l.* attached to the Architectural Gold Medal, will produce an even better effect. The further new provision of a travelling studentship for travel in the United Kingdom is valuable as showing that the existence of native art worthy of study is at last recognised by the Royal Academy, treading in the footsteps of our own Pugin Travelling Studentship, of which, as we know, the results have been so eminently satisfactory. We shall all be agreed in allowing that such successes as the gaining of these artistic prizes in competition, either here or in the Royal Academy, will count as somewhat more than any artistic examination which we can conduct in a few hours here; and in the same way that when a graduate of one of our universities presents himself for examination, what he has already had to do for his degree will not require any sort of repetition at our hands. The Institute having taken this examination in hand, we must all do our best to ensure its success, and in one respect many of us can do more perhaps than we do. It is the master who does bad or inferior work who ruins the prospects of those whose education he has undertaken, and the better the master's work the better will be the prospect of those who have been trained to look up to him. I think I may dare to say in reference to our English School of Architecture that it has in some respects made marked progress within the recollection of most of us. No school, I believe, has advanced more in draughtsmanship, whilst the study of ancient examples at the fountain-head has become universal among all those who have any enthusiasm or ambition. The individuality of the artist, which is the special mark of English art, is stamped as strongly on our architecture as it is upon the sister art of painting, and I trust that we here shall always steer clear of any attempt to follow foreign systems in this respect. I heard only a short time ago the lively expressions of regret of a great German authority, that their Governmental system of teaching deprived them of the enviable independence and originality which struck him so much in our English system of architectural trainiog.

Let me now say a few words to those who at present do not see their way to joining the ranks of this Institute. They are of two classes,—the old and the young; of the former, it would be idle to shut our eyes to the fact that some very eminent names do not appear in the list of our members. Whatever the cause of their absence, I cannot say how much I regret it, and how heartily I wish it were possible to induce some, if not all, of them to give up their self-imposed isolation. I know that we see it asserted from time to time that this Institute concerns itself with nothing but questions of professional practice, professional etiquette, professional payments,—that its whole concern is with the professional as opposed to the artistic side of our necessarily two-sided life. Well, gentlemen, I can only say that from first to last I have spent a good deal of time at your meetings and at your council-table, and my experience is not quite so dreary as those statements would, if they were justified by facts, make it. But those who think that less than the right amount of interest and time is given to artistic questions should, by joining us, strengthen the hands of those,—among whom they may count me,—who more or less agree with them. No one is more loyal than I am in every respect to that Academy of the Fine Arts to which it is my fortune to belong. Were this Institute in the least degree hostile to it, I certainly should not have the honour of occupying this chair. But I hold that it is impossible for an instant to contend that all the artists in our profession are to rest quiescent outside because some half-dozen seats in that body are reserved for a few fortunate architects. It was a wise and noble act, when the Royal Academy was founded, to make its constitution what it was and to combine within its ranks representatives of all the arts. But our art requires much more than this, and I for one feel that we cannot too much interest ourselves in the work of this Institute, in order, above all things, that the position of our art as an art may more and more be recognised.

One of the aims of this Institute is to regulate,—as far as it tries to do so, and that is not very far,—professional practice by discipline, which, being suited for gentlemen, is suited for artists; and those who do not belong to us do most undoubtedly, whether they like it or allow it or not, reap advantages from our existence by their side. If the Institute were even remotely like a trade-union, then no appeal should come from me to these outside brethren. But knowing what its worth is, I do not choose to lose this opportunity of appealing to them to join us.

The younger class is very differently situated. That active body, the Architectural Association, is, in so many respects, working in a groove which runs parallel to our own, that I can never avoid feeling that some means might and ought to be devised for enabling its members to join us. I feel that there is so much that is admirable in their self-constituted system of education, in the energy with which they pursue their work, and in the high excellence of very much of it, that I rather grudge their securing all the energy of the young for an Institution with which we have nought to do. Surely some plan might be devised by which our juniors might, under their own government, be training themselves until they gradually fall into their places among us, instead of, as now, finding themselves obliged to belong to both Institutions where one should suffice. The young men ask for self-government; but I, who am no longer a young man, do not hesitate to say that this Institute suffers much and seriously by their practical abstinence from our meetings, our society, and our work. And if it were possible,—and it does not seem to me to be impossible,—I should, above all things, like to see their connexion with us established, together with full liberty of self-government as to all those educational arrangements which they at present appear to manage so admirably and to prize so much. I believe that few of us grow much better artists as we grow older. A man's best work is generally done between the age of twenty and forty, and we should all gain very much if our younger friends would occasionally read papers and join in discussions with us older men. What chance there may be of doing anything in this direction I know not; but nothing would give me more pleasure, during my time of office, than having to assist in any such fusion of the two bodies as may be found practicable.

There is again another class which might be more largely represented here, and this is the class of provincial architects. Some of our most distinguished members practise in the provinces, but the number of these who belong to us, compared to the total number of those who are really practising as architects in the country, is very small. I am well aware that the number of architects who could join us must be largely discounted; for among those whose names appear in directories are many who are architects only in name. But making every abatement in this way, I cannot but regret that no scheme has yet been successfully launched for creating local associations in connexion with this Institute, whose members should be bound by exactly the same by-laws, and who, either in towns or districts, should have the right of electing annually their own representative to sit on our council. It may be objected that if all my suggestions were feasible and were acted on, there would be no one left outside our ranks, and we should then inevitably attempt to make ourselves a close corporation. I do not fear this, or I should not make such proposals. The British public, depend upon it, will take good care that it can retain its liberty to employ whatever architect in its wisdom it prefers; and the occasional incursion upon us of an amateur, or of a sculptor or painter, seems to me to be likely to do much more good than harm to us and to our art.

I fear, gentlemen, that I am trespassing upon your kindness and patience; but I shall detain you now but a very short time, whilst I endeavour to gather up the suggestions which I have already made as to the work which lies before us, to be done somehow or other if this Institute is to do its duty by our art and by the world.

We have gone on far too long enduring the existence of bad building on all sides, shutting our eyes to it and declaring it to be none of ours and that we can accept none of the responsibility for it. Believe me, we are deluding ourselves. If the architects are now more numerous, more united, and so much more powerful than ever they were before, to what purpose is their power if it cannot persuade those who build so badly to build better? The fault, I fear, is with us. We hear architects of position plume themselves on being "practical" men; we see them indulge in so-called practical discussions, whilst they earnestly deplore the over-great attention which others would fain see bestowed on what they call merely artistic questions. So much is said about practice and practical matters that by degrees they cease to realise that the business they are pursuing ought primarily to be regarded as an art pure and simple, and thus looking first of all at the lower side of their art, they end by ignoring wholly the higher side. Do not mistake me. In our art the best artist is the most practical man. There is the highest art in the best disposition of a ground plan. There is equal art in the best construction applied to a scientifically-devised plan, and in the same way there is the highest art in so disposing the plan that the arrangement shall be convenient for the purpose and yet admit of well-balanced masses in the elevation, and well-arranged outlines and skylines. Beauty of detail is inferior in artistic importance to these qualities, but essential, of course, to a perfect work. I plead that, if we all in due order took this really practical view of the requirements of our art, all our buildings would begin by being well planned, would next be well and soundly built, with elevations meant to bear inspection wherever seen. There would be no sham fronts or false use of materials or deceits as to construction; and if our 900 architect members were all building in this way, depend upon it the day would not be far distant when good building would be so much the fashion, that the builder unassisted by an architect would not care to do such vile work as now he almost always aims at and succeeds in doing. The conclusion to which I have come after many years' experience is that the well and honestly-constructed building never excites contempt. We may regret that it has no style, but if it have the qualities just named it may be said to have the first elements of style in itself, and can dispense with anything adventitious. That fashions in art come and go, most of us have already seen evidence; but really good work is never out of fashion, whatever its style. One revolution we have seen accomplished under our very eyes. We have lived in the days of compo, we are now living in the age of brick. We have seen the world outside us converted from the use of a bad and mean material to that of a good and honest one; and I am sanguine enough to believe in the possibility of such a change in other respects as may make all building throughout England more tolerable because more honest and less vulgar than it now is. If I did not think this a matter which ought to be taken to heart by every one of us, I should not venture so frankly to state my strong opinions. I hope that I shall not find myself without very general support, and that in due time our own consistent determination never to build anything which is not solidly and well constructed with the best art we can bestow, will not only make men honour us for our work but anxious above all things consciously or unconsciously to build and work in the same way. Certain it is that, when we have accomplished this, we shall have just reached the point which every good school of architecture throughout the world seems to have reached long before its best period.

COMPETITIONS.

Fulham Infirmary.—Some of the Board, it is said in the neighbourhood, do not quite agree with the referee's selection:—1, "Experience," in circle; 2, "Simplicity"; 3, "M. D."; and propose to visit various infirmaries themselves, previously to the meeting which is to be held on the 22nd to consider thematter.

Proposed Markets, Kendal.—Mr. Eli Cox, architect, Kendal, was last week awarded the first premium in this competition.

The New Corn Exchange, Sheffield.—In addition to particulars given, we are asked to state that the large fire-resisting door for the muniment-room of his Grace the Duke of Norfolk, in this building, was supplied by Messrs. Chubb & Son.

CLEARING THE STREETS AND MANNING THE NAVY.

ENERGETIC men amongst the Middlesex Magistrates have been long urging the pressing necessity of measures to maintain the efficiency of the Royal and Mercantile Navy. It has been argued in the course of the discussion, for example, that to keep it up in a prepared and efficient state, and to avoid in a moment of emergency the having to man our merchant-ships with the refuse of seaport towns, or with foreign hirelings, depôts of trained and educated seamen are an absolute necessity. Captain Bedford Pim urged energetically, amongst other matter, in his "Training-Schools and Ships Bill" brought before Parliament in 1875-6-7-8 consecutively, the want of more inland and training schools than we at this moment possess.

The great question is, from what material are the training schools to be formed? and the answer seems ready to hand,—from children who have earned a right, from their father's services in various parts of the globe, to receive a free and liberal education; from good and honest boys desirous to enter the service from love of it; and from the thousands of waifs and strays that are growing up uncared for in our midst, and who threaten to become a very dangerous element of the community.

The great torrent of pauperism which is in far too large a proportion to the population of this realm, and more especially to that of London, ought to occupy the earnest attention of statesmen to stem and guide, if they cannot absolutely govern it,—men must live,—and if they cannot by fair, they will by foul, means. The object to be aimed at is to try and purify this stream of human life at its very source, ere it filters through our empire; to provide honest labour and useful professions for the thousands of unemployed hands, to fill our ranks with gallant soldiers and man our Navy with daring and trained seamen,—men who do not go to sea as a last plank against starvation, and who are as ignorant of the real "carpentry" of the profession as a school-girl, but those who adopt it from an honest love and pride in it.

But love and pride in a profession do not come in a moment with lightning flash. They must be nurtured, encouraged, and fostered in a boy. There are many intervening stages of drudgery and hard work ere the workman becomes worthy of his hire, and training-schools are beyond question the best means towards meeting this want; but in view of our vast unemployed juvenile population, more are required still. To-day it is of Feltham we would more especially speak, and point out how admirably, in respect of the *third class* of boys we have mentioned, the system of training-schools answers.

To trace step by step the cause from which the happy results there have sprung, is most interesting. The attention of the magistrates of the county of Middlesex was drawn, in 1850, to the crowded state of the prisons, and the shameful injustice of children of still tender years being incarcerated promiscuously for some trifling offence,—for which the horrible social miasma in which they had been reared had rendered them, if not legally, at least *morally irresponsible*,—being shut up with prisoners of the worst description, even sleeping side by side with them, thus inuring them to the lowest and most degraded view of human nature. These gentlemen having then succeeded in re-organising the prisons and classifying the prisoners, drew the interest and the attention of the public at large towards the establishment of County Industrial Schools for the reception of juvenile offenders. At first alone in their opinion, later on they had the public with them; and Mr. Antrobus (whose telling articles on the subject of the juvenile lower classes of London, written in the *Navy*, are as much to the point now as when published) brought forward, in conjunction with other earnest and philanthropic men, a motion at the Court of Quarter Sessions for the county of Middlesex in 1853, that a special committee should be appointed to consider the propriety of applying to Parliament for an Act to erect and maintain one or more County Industrial Schools for the reception and care of the juvenile offenders of the county of Middlesex, with power to communicate with her Majesty's Secretary of State for the Home Department. This motion was carried unanimously, forty-six magistrates being present; and in 1854 the Legislature passed the Middlesex Act, and at Feltham was established what has become one of the best managed and best organised schools in the kingdom. To the Middlesex magistrates, therefore, led by Mr. Antrobus, is due the honour of establishing the first,—and alas! as yet the only,—County Industrial School in the kingdom. Since 1854, 4,000 boys have been admitted within its walls.

How often has the question been asked,—"Why are British sailors so often deficient in the thrift, the sobriety, the discipline, the self-control, which education is intended to provide?" Because they have been under no parental (or the worst of parental) control; because they have lived in a contaminated atmosphere without a benevolent guide, subject to no control, subject to no good example; so they find discipline and order irksome, and are deficient in sobriety.

It is, then, the early education of the boy,—the removing him from injurious influences; the subjecting him to kindly but strict discipline, that must remedy this; and schools such as Feltham, or on the model of Feltham, seem to be the best calculated to do this. The establishment at Feltham consists of an area of ninety acres; the school was designed by Messrs. Banks & Barry, not for show or ornament, but for accommodation, cleanliness, and comfort. There are farms, dairies, workshops, and a full-rigged brig, homes for the subordinate masters, &c. Here, as Captain Brookes, R.M., the director, observes, they have discipline, order (kindly, if strict), and constant supervision; and they are taught every useful trade and occupation,—farm-work, the grooming of horses, gardening (and some of their vegetable produce might put trained gardeners to the blush), carpentry, bricklayers' work, every sort of agricultural work that will fit them for home labour or for emigration; they are taught instrumental music by qualified men who have been in regimental bands, and they can thus enter the army as band-boys. There is a vessel on the lines of a ten-gun brig, fitted up and rigged on the grounds, and seamen are engaged to teach the boys all the details necessary for following a sea-life; and, although an Industrial School, it was absolutely necessary that strict discipline should be maintained, so that, from the first, it became a semi-military and naval establishment.

Boats are provided on the river at Staines for the instruction of the boys in rowing and managing the same, and every boy before entering the boats is taught to swim.

It will be seen by the reports of the committee that 88 per cent. of the boys turn out well; and when Mr. Antrobus last distributed the prizes, he adverted with pardonable pride to many a gallant deed performed on land and sea by Feltham boys, whose names had even swelled the list of heroes, and had been recorded in despatches.

The establishment at Feltham differs from other institutions in that all boys in it need not have been juvenile offenders and committed for some petty offence. Instead of returning to a life of pauperism or crime, they are taken in hand, rescued, sheltered, fostered, and from apparently somewhat unpromising materials, good men and true are moulded, who look back in after years to the "old place," as they call it, with affection, and attribute their success in life to their training there.

We would pause for a moment and mention that on the day we assisted at Feltham, Sir Astley Cooper Key, First Naval Lord of the Admiralty, was distributing prizes to the successful candidates at the Royal Naval School at Greenwich. The Admiral reminded them that the boys who came there came not for their own merits, but for the services rendered by their fathers in every part of the globe. These boys start, then, on their career with a "fair wind and flowing tide," good antecedents and honourable lives to emulate and act up to. But how many other poor little fellows owe their first step in wrong-doing more to their evil surroundings than to themselves?

Nurtured in back alleys, in pestilential slums, surrounded by social plague spots, by the ever-festering sores of dirt, disease, and moral corruption, lying like Lazarus at the gate of Dives, appealing to be healed, living in that "inner life" of London, that world within a world (so ably depicted in those remarkable little books, entitled "London Shadows," "Town Swamps," &c., not unknown to readers of the *Builder*), these boys would have grown up worse than useless members of the community, a drain on the State, or would have helped to fill our prisons with hardened and despairing criminals, were it not for the exertions of men who make these noble institutions the work of a lifetime,—crucibles in which the gold is separated from the baser metal. Here in this pure and healthy atmosphere their little stinted frames develop into fine physical proportions, and the mind expands in the same healthy ratio as the body. Here, like bees in a hive, in this well-arranged little colony, they work together as one harmonious whole.

The swimming-baths at Feltham might be the envy of any gentleman's school in England; and under the vigilant yet kindly rule of the Governor, Captain Brookes, of their genial chaplain, Mr. Newton, and the excellent body of men who instruct them, they learn to love their happy and useful home. No boundary-walls are needed, for the case of a boy with a great "R" against his name has never been known!

The prize day itself began with a very interesting ceremony,—the confirmation of the boys by Bishop Claughton,—their dinner,—inspection on parade and inspection of the training-ship followed; and a prettier sight than the "making" and "shortening sail" on board the ship by these little blue-jackets, could hardly have been seen. Later on, when formed into a compact mass in the new gymnasium built by themselves, the young drum-major's staff being planted in front of them, and on which were inscribed the names of those who had won the yearly prize for good conduct, one by one the successful candidates received various valuable prizes from Mr. Antrobus and the gentlemen of the committee. Well might Captain Brookes exclaim as he gazed downwards on the sea of young upturned faces,—

"If you seek a monument, look around."

In the organisation of such a school as Feltham, the question how to provide men for the sister services seems partly answered. One of the clauses of Captain Bedford Pim's Bill was to establish more inland and county training-schools,—in fact, one in each county,—and to provide there the teaching of the rudiments of nautical matters, which can be learned as well on land as on sea, for boys who had committed *no* offence, and, thus to extend the benefits of this valuable system. We should thus be ready at any moment to meet cases of emergency whether in time of peace or of war, and to prevent our merchant-ships from being manned at the last moment of starting with the off-scourings of the port, or a large mixture of foreign seamen. We are told that half the crews of our mercantile ships are composed of Lascars, Russians, Germans, Greeks, and other foreigners, often incapable of working together or understanding an order given them.

In this age, when anything from a siege to a murder is forgotten in nine days, the loss of the *London* is probably forgotten also, but the words of one of the survivors point to the moral:—

"Work was always ahead, sailors continually at work; yet the ship was never 'snugged,' the crew had not got used to the ship: and another difficulty, many were foreigners and did not understand English. Mr. Angel directing a man to do something, the poor fellow was anxious to do it right; but every attempt was wrong; at last I discovered he did not understand a word that was said to him."

Later on he records Captain Martin's words to a few of the sailors who were opening brandy bottles, calling some by name, "Don't do that, boys,—don't die cowards!"

With a reserve depôt no ship need ever run the risk of being manned like this.

We do not see why, with such remarkable advantages as Feltham possesses, it should not come to be recorded that nearly cent. per cent. instead of 88 per cent. of the boys turn out well; and the fault must be, if we understand the subject rightly, that the boys are not left sufficiently long under the entire control of their *pro tem.* guardians, but can once more fall into the power of their parents before their tastes, ideas, and principles are sufficiently matured and strengthened to enable them to resist the low allurements which a life of non-control and vice may have for them.

The magistrates were desirous to have other and greater powers given to them than are contained in the Act; especially the power of detaining the children longer than three years, particularly those under the age of twelve, and the power of ultimately disposing of them independently of their parent or parents; they were, however, compelled to confine their application to the powers contained in the Act as the greatest the Legislature would grant.

This seems rather a grievous error; where

the parents fail, ought not the State to step in and become the parents of these worse than orphan children? In a higher sphere they would become wards in Chancery, to whom efficient guardians are assigned. Ought not these children to become wards of the nation? And when a body of excellent and honourable gentlemen of high position step forward and offer to become the guardians of these waifs and strays, it seems short-sighted policy for a Government not to help them in the good work, or to put unnecessary impediments in their way, especially as the Government have it always in their own hands to supervise these establishments, and see that discipline never degenerates into thraldom.

We are accustomed in these latter days to dip our pens in milk-and-water, and write on rose-leaves. One hesitates often before taking the trouble, like Samson, to shake the pillars of the temple of many a rotten old system, burying false idols in the rubbish, and to erect in their stead theories with larger vistas and more extended views. There ought to be members who have the power to advocate in the House such a Bill as we have alluded to. They would thus help more of these utterly helpless little ones, and advance some system that would prevent their sinking into the mire from which they have been drawn,—into a life, as Mr. Antrobus says, in which moral law is unknown, and where the detection of a crime is thought worse than the crime itself.

"Cases have been known where boys have never, or for two years at least, slept in a bed, or known a friend; and all that time had supported life by eating raw vegetables and cast-off meat in Newgate and other markets; or, owing to the abandoned and dissolute life of their parents, were so deficient in mental powers as to render it almost impossible to teach them."

And, speaking, of such children who but recalls the eloquent words of Dickens, uttered by the spectre in the "Haunted Man," as he points to the wild elf-child that has crawled from the streets and sought shelter in the haunted man's house:—

"Look," he says, pointing to it, "look! there is not one of these,—not one,— but sows a harvest that mankind must reap from every seed of evil. In this boy a field of ruin is grown that shall be gathered in and garnered up, and sown again in many places in the world, until regions are overspread with wickedness enough to raise the waters to another deluge. Open and unpunished murder in our streets would be less guilty in its daily toleration than one such spectacle as this. There is not a father by whose side, in his daily or his nightly walks, these creatures pass; there is not a mother among all the loving mothers in this land,—there is no one risen from the state of childhood,—but shall be responsible in his or her degree for this enormity. There is not a country on the earth on which it would not bring a curse. There is not a religion on earth it would not deny; there is no people on earth it would not put to shame. Behold, I say, in that child the fruits of man's indifference."

If, feeling this, and seeing some means towards remedying so dire a state of things, —and Mr. Antrobus assures us that the London street boy, brought up in the haunts of vice and living in a state of destitution is, when removed from their influence, as easily reclaimed as any other,—a Legislature refuses to help, is it not in some degree responsible before Heaven for such a state of things? Rather than let the children fall back into their old life, "it were better to put a mill-stone round their necks and drown them." To work for the good of all ought to be agreeable alike to Conservative, Liberal, or Radical. For whatever party spirit may be in the House, we must hope a true Englishman's desire is first his country's good.

The Training Schools and Ships Bill seems admirably calculated to help towards elucidating this vexed question, and if any one wishes to judge for himself how the system of a training-school will answer, let him visit Feltham, and see from the seed sown there what elements of good can spring; how from the living material the safest and the surest bulwarks of our realms can be constructed; he will see young men grown up there, who have been taught to uphold the dignity and respectability of the working man at home or in our colonies, or to "float our flag untarnished o'er a thousand seas"; men who may enable their commanders to reiterate the words of the immortal bard,—

"Come the three corners of the world in arms
And we shall shock them. Naught shall make us rue
If England to herself do but rest true."

CARLEON.

The Female School of Art.—The annual exhibition of students' drawings which have obtained the various medals and premiums offered will take place at 43, Queen-square, on this Friday, 18th, and Saturday, 19th.

STEEP INCLINES.

A CORRESPONDENT, signing "C. E.," demurs to our remark,—"A rise of 1 in 20 is the limit of ordinary engine-power, as all that a locomotive can do is to ascend such a gradient without any load." He says:—"Within ten miles of this place (Newport) there is a railway with a gradient of 1 in 20, several miles long, upon which passenger-trains and heavy goods-trains are daily worked by single locomotive engines; there is another line, eight miles long, the gradients of which vary from 1 in 28 to 1 in 39, worked daily by locomotives. I have myself worked gradients of 1 in 12 by locomotives, and loads of 50 to 100 tons including the engine."

Vol. lxii. of the "Minutes of Proceedings of the Institution of Civil Engineers," p. 388, gives a table of "Surmountable Gradients." This includes—

	Gradient.	
Eaghien and Montmorency Railway.	1 in 22	Steepest incline in Europe worked by ordinary engine.
Certain railways in America.	1 in 20	Limit of ordinary engine power.

The "Navigation Incline" of the Taff Vale Railway, sixteen miles from Cardiff, averaging 1 in 20 for half a mile, is worked by a six-wheeled coupled engine of thirty-six tons weight, which takes a regulated load of twenty-five tons. The co-efficient of adhesion was calculated as one-tenth.

On the Great Southern and Western Railway of Ireland a six-wheeled coupled locomotive, weighing thirty tons (20 per cent. less than the former engine), will draw a weight of 607 tons on a level at a speed of twenty-five miles an hour. The proportion for a thirty-six ton engine would be 728 tons, as against twenty-five on the "Navigation Incline."

An ordinary engine, weighing twenty tons, with twelve tons weight on the driving-wheels, and tender weighing fifteen tons, would have an adhesion of 1·2 ton, and a resistance, from gravity alone, on an incline of 1 in 20, of 1·7 ton. It would, therefore, *not* take up its tender, when the rails were slippery.

On the Fell Line over the Mont Cenis, the twenty-one-ton engine has been known to pull twenty-four tons up the incline of 1 in 12½ (in favourable weather), by the driving-wheels alone. But the cost was 9s. 8½d. per train mile, or 4·177d. per ton mile of train; above twenty times the average cost of working the railways of the United Kingdom.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,725. H. Skerrett, Birmingham. Flushing water-closets, &c. Oct. 28, 1881.

4,731. J. H. Johnson, London. Compositions for stone, wood, &c., to render the same impervious to air, water, &c. (Com. by G. O. Kramer & Co., Osnabrück, Prussia.) Oct. 28, 1881.

4,741. J. Thomas, Bangor. Chimney-pieces. Oct. 29, 1881.

4,745. R. T. Gillibrand, Darwen. Apparatus for heating water and consuming smoke, &c. Oct. 29, 1881.

4,787. J. Dunnachie, Glenboig. Stoves or heaters for apartments. Nov. 2, 1881.

4,795. G. W. von Nawrocki, Berlin. Kilns for burning bricks, &c. (Com. by E. Arnold, Fürstenwalde, Prussia.) Nov. 2, 1881.

4,796. G. H. Jennings and S. Jennings, Stangate. Lavatories and urinals. Nov. 2, 1881.

4,821. W. Jones, Manchester. Apparatus for measuring water and other fluids. Nov. 3, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

Nov. 1, 1881.

2,820. H. Fabian, Erith. Floor-cramp. June 28, 1881.

2,845. T. Drake, Huddersfield. Apparatus for heating water, &c. June 29, 1881.

3,968. F. T. Bond, Gloucester. Appliances for heating water, &c. Sept. 14, 1881.

4,020. G. West, New Lenton. Smoke-consuming apparatus. Sept. 19, 1881.

Nov. 4, 1881.

2,920. W. W. Hewitt, Swanscombe. Screw apparatus for conveying cement from place to place. July 4, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending November 5, 1881.

1,138. W. P. Van Wyk, London. Ornamental blind.

To form a blind with a perfect framed border, it is made in two separate pieces of cloth, &c., one of which forms the body of the blind with stripes lengthwise at the two sides, whilst the other forms the border at the top and bottom by being sewn across the former piece. March 18th, 1881. Price 6d.

1,143. W. R. Comings, London. Door-locks.

Instead of the usual bent springs of irregular shape, a straight spring is used, which operates both the lever or tumbler and the latch. (*Pro. Pro.*) March 16th, 1881. Price 6d.

1,286. O. Wolff, Dresden. Warmth reservoirs.

A cylinder is partly filled with water, which is brought to boiling-point by a gas-jet underneath. A perforated mantle is placed over the cylinder. A vessel, filled with hyposulphite or acetate of soda, is melted in the boiling water, and then placed between the cylinder and the perforated mantle. This retains the heat for a lengthened period. (Com. by A. Nieske, Dresden.) March 23rd, 1881. Price 6d.

1,304. J. Rettie, London. Binding for scaffolding.

A chain is used, having a tongue at one end and a loop at the other. The tongue has rows of slots, and when the chain is passed round the poles, the loop is slipped over the tongue and a wedge inserted in one of the slots. March 23rd, 1881. Price 4d.

1,352. W. Heggott, Bradford. Apparatus for regulating fanlights.

A bracket is attached to the top or side bar of the frame, in which is a worm gearing into a worm-wheel, on the axis whereof is a deep grooved pulley, to which is attached a cord or chain, which regulates the fanlight. March 26, 1881. Price 4d.

1,366. F. W. Hagen and G. C. Akrigg, Kingston-upon-Hull. Trap for drains and sewers.

A well is formed below the grating, closed at the bottom, but with a side opening and curved syphon pipe to connect with the drain or sewer. An inner case is made of the same section as the well, with gratings all round or opposite to the side opening only, and with a handle at the top, so that it can be lifted out. All solid matters falling through the grating will remain in the inner case, while the liquid portion falls through the drain. March 28, 1881. Price 4d.

1,367. T. Wrigley, London. Construction of ceilings.

A number of discs, in shape the frustrum of a cone, are secured to the lathes, joists, or surface to which the plaster is to be fixed, the smaller surfaces of which, when secured by tacks, screws, &c., bed against the laths forming the foundation of the ceiling. (Com. by S. Müeller, Nürnberg, Germany.) March 28, 1881. Price 6d.

1,387. T. Bradford, London. Apparatus for riddling or sifting cinders.

In an outer box is hung on bearings an inner tray with a meshed wirework bottom. A vertical hand lever agitates the tray and sifts the cinders, the ashes falling through to the bottom of the outer box. March 29, 1881. Price 6d.

1,414. J. S. Rigby, Farnworth, and J. Mangnall, Manchester. Lead or other ductile pipes for water services.

The piping is made sectionally of an oval shape, and in the larger sizes a midfeather connects the flat sides in the direction of the minor axis of the oval. March 31, 1881. Price 2d.

1,420. J. Russell, Westminster. Glazing.

The sash-bar or rafter, grooved or rebated at the sides, is covered with lead in one piece in the width, formed with water gutters each side, and so arranged that the free edges can be folded down over the edges of the glass, and hold it in position without the use of putty. March 31, 1881. Price 6d.

1,429. J. Turner and J. Robertshaw, Manchester. Sanitary appliances and receptacles.

The sanitary pail has a perforated false bottom to allow and liquid to percolate through and fall on to the pail bottom, from whence it is drawn off. March 31, 1881. Price 8d.

1,434. H. Barron, London. Disinfectant and deodorising apparatus for water-closets.

A cistern for the disinfectant is arranged above the closet, from whence one pipe leads to the upper rim of the closet-pan, and another to the neck of the syphon under the pan valve. (*Pro. Pro.*) April 1, 1881. Price 2d.

1,440. B. Giles, Blackheath. Means for preventing the explosion of kitchen boilers, &c.

When the pressure in the boiler has reached its determined limit, the heated water is discharged by the rupture of a metallic covering to an opening made in the boiler. The cap of the opening is made of thin sheet copper, which presents to the water a convex face. The extra pressure will thrust this outwards, reversing the form and showing a concave face, which will rupture this sheet and allow the water to escape. April 1, 1881. Price 6d.

1,446. T. Kauffmann, Cologne. Venetian blinds.

Small chains are used with rings fixed thereto, to which are fitted pins to be fixed directly to the latter. The roller has two drums upon which the pulling-up cords, which are of flexible metal, are rolled up. A ratchet wheel forms a stopping arrangement and guides are used to expand the blind. April 1, 1881. Price 6d.

* Compiled by Hart & Co., patent agents, 29, New Bridge-street, E.C.

1,450. R. McDonald, Wishaw. Safety and alarm apparatus for kitchen boilers.

This is applicable to pressure kitchen boilers. When the water is circulating freely through the ascension pipe it presses a ball float up and keeps a valve leading to a whistle closed. But when the water is too low the ball sinks, opens the valve, and blows the whistle. (*Pro. Pro.*) April 2, 1881. Price 2d.

1,457. R. D. Reeves, Parkhurst. Ventilating apparatus.

This is an improvement on Patent No. 1080 of 1874 in forming the front plate with corrugations and openings through it. Opposite the inner ends of these openings are recessed chambers with corrugated sides. Between the back of these recessed chambers are other conical or inverted bell-shaped pieces also with corrugated surfaces, which are capable of movement so as to regulate the extent of the passage for air. April 2, 1881. Price 6d.

1,459. W. Baird, Dublin. High pressure ball-cocks and air-valves or air-inlet combined.

The water in the pipe holds the valve of the ball-cock in its seat when the cistern is full, but when the cock at the lower part of the house is closed and an intermediate cock opened, the valve is forced from its seat by the pressure of the air, and prevents thereby any freezing or bursting. (*Pro. Pro.*) April 2, 1881. Price 2d.

DECEIVING THE DISTRICT SURVEYOR.

A WARNING.

In a case which came before the Judge of the Lambeth County Court last week, the plaintiff, William Bilham, of Coldharbour-lane, Brixton, sued the defendant, Alfred Geard, of Linnell-road, Camberwell, a builder, for the sum of 9*l.* 17*s.* 8*d.* on a contract. The plaintiff stated that he had entered into a contract with the defendant to do the bricklayers' work of four houses in Shenley-road, Camberwell. The defendant had paid 96*l.* on account, leaving a balance of 4*l.* There were certain alterations in addition, charged for as "extras," which brought up the total to the sum claimed. Amongst these alterations was a charge of 2*l.* 1*s.* 6*d.* for bay-windows. The alterations were rendered necessary through an order from the district surveyor, the plaintiff admitting that he had endeavoured to elude the surveyor, at the suggestion of the defendant, by putting in 3 in. of brick instead of 4½ in.

At this point the Judge observed that the plaintiff could not recover this part of the account, because he had conspired with the defendant to act contrary to law.

Mr. Ody, who appeared for the plaintiff, said that practically the endeavour to deceive the district surveyor was the act of the defendant, when his Honour replied that it was the act of both. It was like his saying to a person, "I will give you 10*s.* if you knock my friend down," and that person then endeavouring to recover the amount. He did his best to elude the Act of Parliament, but failed; and he (the Judge) did not think he could recover. It would be a very bad principle if such claims were allowed.

Judgment for the defendant.

THE NEW WAR AND ADMIRALTY OFFICES.

It is announced that, after careful consideration, it has been determined to propose to Parliament the erection of the new buildings for the War Office and the Admiralty on the site of the present Admiralty, the Paymaster-General's Office, and the area now occupied by Spring-gardens, New-street, and Spring-gardens-terrace. On this site it will be possible to erect a block of buildings which will have a frontage to Whitehall from the Horse Guards to Messrs. Biddulph's Bank; its façade to the Horse Guards Parade will be on the line of the Admiralty garden wall; its west front will be upon the site of Spring Gardens-terrace and the end houses of New-street. This site will afford space for a block of buildings with three large and two smaller courts, giving 112,000 square feet of building space, which will be amply sufficient for the accommodation of the two offices. The War Office will adjoin the Horse Guards, which it is not proposed to interfere with, and the frontage to Whitehall will be divided equally between the War Office and the Admiralty. Official houses for the first Lord of the Admiralty and the First Naval Lord may be erected on the west side of Spring-gardens. The private garden in front of Spring Gardens-terrace and New-street will be added to the park.

London and Middlesex Archæological Society.—The opening meeting for the present session was held on Monday evening last. We defer our report until next week.

LANDLORDS' LIABILITIES AND DILAPIDATED HOUSES.

At the Lambeth County County, last week, Mr. Boyes, the tenant of a house in Brixton, was summoned by his landlord for the rent of a house which he occupied from the latter, and which he had left without notice. In answer to the demand, the defendant said he had left the house without notice because he had found it all to pieces. There was no water laid on, the door was a disgrace to the road, and the inside of the house was equally bad. He had written to the plaintiff, calling attention to its condition, and telling him that if it was not attended to within a week he should go elsewhere. The defendant did not attend to it, and he left accordingly. The plaintiff said sufficient time had not been given him to carry out the repairs, but the judge ruled that ample time had been given to the plaintiff to take notice of the defendant's complaint, and judgment would be in the defendant's favour, and he should also allow the defendant's costs, as he considered he had been treated in a very arbitrary way.

Other authorities have ruled differently from this in apparently similar cases. It is very desirable the law on the subject should be made clear.

CHRIST CHURCH, KENSINGTON.

The east window at this church has been slightly altered in the tracery, so as to afford better scope for the subject of the new painted glass. The idea represented is a less common one than usual, being Our Mortal Life, the Resurrection, and the Life Eternal through our Saviour. Commencing from below,—(1) the Teaching of our Lord; (2) Our Life, encompassed with Sorrow and Sin, calling for Resignation and Penitence; (3) the Resurrection of the Body, the Earth and Sea giving up the Dead on the sounding of the Last Trump; (4) the Kingdom of Heaven, as illustrated by our Lord; (5) the End of Time, as proclaimed by the Angel in the Book of Revelation. The cartoons are by Messrs. Weekes, and the remainder of the work by Messrs. A. L. Moore & Co., of Southampton-row. The glass is the gift of Miss Debnam, a member of the congregation. The choir vestry has been enlarged and a new clergy vestry added, Mr. Hockly, of Kensington, being the builder. The architect has been Mr. B. Edmund Ferrey. The new reredos was supplied from the establishment of Messrs. Jones & Willis.

THE AGE OF CLEOPATRA'S NEEDLE.

Sir,—I was somewhat astonished to read the following in an evening paper the other day:—

"*Cleopatra's Needle.*—All the additional art-decorations which have been in course of preparation in connexion with the obelisk on the Thames Embankment are now finished. The principal tablet, which faces the river front, has the following inscription:—

'Through the patriotic zeal of Erasmus Wilson, F.R.S., this obelisk was brought from Alexandria in an iron cylinder; it was abandoned in the Bay of Biscay, recovered, and erected on this spot by John Dixon, C.E., in the forty-second year of the reign of Queen Victoria.'

And on the west side will be the following:—

'This obelisk, quarried at Syeni, was erected at Heliopolis by the Pharaoh Thothmes III., *about* 500 *B.C.*'"

with other details of the ancient history of the relic.

Can this be authoritative?

Without any further observations, however, I will ask you to be good enough to quote two paragraphs from Sir Erasmus Wilson's interesting little pamphlet on "Our Egyptian Obelisk, Cleopatra's Needle," which must be familiar to all interested in the slightest degree in the history of that ancient and wonderful country whence this obelisk came:—

"Originally there were seven or more obelisks at On,* but of these only one single obelisk now remains, almost the sole surviving relic of that ancient city. The existing obelisk is the oldest in the world, having been erected upwards of 3,000 years before the Christian era, and consequently nearly 5,000 years before the present time. Four of the remaining obelisks were set up by Thothmes III. and his family, *more than* 1,600 *years before the birth of Christ*, and, therefore, about 3,500 years from the period. Two of these four were called Pharaoh's Needles, and now serve to decorate the cities of Constantinople and Rome; while the other two were transferred to Alexandria to become celebrated as Cleopatra's Needles.

Cleopatra's Needles, whilst at On, stood in front of the temple wherein Moses received his education, where he made himself proficient in Egyptian philosophy, and where his mind became fortified for the great work he was afterwards destined to accomplish, the liberation of his fellow-countrymen from the harsh dominion of the Pharaohs, and the exodus of the Hebrews from the land of Egypt. Rameses the Great,* *one of the heroes of our obelisk*, has the reputation of having been the oppressor of the Jews, his great undertakings, no doubt, contributing largely to that result, whilst Menephtah, his successor, was the acknowledged Pharaoh of the Exodus."

The italics in all cases are mine. Why, may I ask, should the principal tablet on the base of Cleopatra's Needle face the river front?

H. H. Bridgman.

*** Since this letter was in type, the *Daily News* (for Thursday, the 17th) has published an account of what is being done. According to that journal, while the text of the first inscription, as above quoted, is substantially though not verbally accurate, the date mentioned in the second inscription (of which only a portion is quoted above) is "*about* 1500 *B.C.*," not 500 B.C.

* Heliopolis of the Greeks.

SIR CHRISTOPHER WREN.

Sir,—It may be interesting at this time, when the life of Sir Christopher Wren by Miss Phillimore is just published, to state that some letters of Bishop Matthew Wren (uncle of the great architect) exist in Lambeth Palace Library. In the picture-gallery hangs a small full-length portrait of Dr. Wren, Dean of Windsor, similar to the print in the "Parentalia." Another MS. of much value is entitled "An Account of the Re-building the Cathedral Church of St. Paul, from September, 1666, to September, 1700. Connected with this subject are the notes of John Evelyn, who visited Archbishop Sancroft in 1682; he was accompanied by Sir Christopher, and brought for the Primate's approval "a plot and designe of the college to be built at Chelsey." In 1684, the diarist went with the great architect "to Dr. Tenison, when we made the drawing and estimate of the expense of the library to be begun this next spring near the Mews." This refers to Archbishop Tenison's library, which was standing until 1860 in St. Martin's-in-the-Fields, when the contents were sold by auction.

The magnificent roof of this great hall (Juxon's) is said to be the work of Wren, and there are other indications of his skill here. I wish to express the liberality with which the Primate has not only extended the hours of study at this library, but approved of the loans of books in the adjacent parishes, and to the clergy and laity in the diocese of Canterbury.

S. Wayland Kershaw, M.A.

Lambeth Palace Library.

CLEANING CISTERNS.

Sir,—Is there any clause in the Metropolis Water Act, 1871, or any regulation that can be enforced against me for having a plug in the bottom of my cistern for the purpose of running the water off, so that I may clean it out that way instead of drawing it off at the sink? I have an overflow-pipe, or warning-pipe, near the top, which is easily seen from a window without going outside. The old standing waste-pipe is bossed over and soldered on the top, and is now simply a plug to run the water out, certainly into the drain as before, but no foul air can rise into the cistern, or any water go down unless the plug is lifted. The water inspector, or whatever he is called, objects to this, and has served notice to take it out and solder over the hole. If this regulation is carried out, good-bye to clean cisterns, at least, in the poorer neighbourhoods. I myself have very recently seen some with 1 in. to 2 in. of mud at the bottoms, even where easily got at.

Alfred Lawrence.

COMPETITION FOR BOARD-SCHOOLS IN BARROW-IN-FURNESS AND ROOSE.

Sir,—About fifteen sets of designs were sent in for the above schools. At the first meeting of the Board to decide, the plans of Mr. Holtom, of Dawsbury, were selected for the Barrow schools, and Mr. Eli Cox's, of Kendal, for those at Roose. At a subsequent meeting the Board could not agree, so they were referred to Sir James Ramsden, and he gave the final award in both cases to the first named gentleman. It seems a strange way to select plans at one meeting and send for the architect to meet the Board, and then at another meeting to undo the thing again.

A. B.

The Coming Electric Exhibition at the Crystal Palace.—The authorities of the Crystal Palace sent out on Saturday last the allotments of space to the principal exhibitors of electric lighting appliances at the forthcoming exhibition. If the electric lighting companies and firms carry out their promises and intentions, the Palace will be lighted from the London, Brighton, and South Coast Railway Station to the north end.

* Rameses II.

FALL OF A HOUSE.

About six o'clock last Saturday evening the foundation of the outer party wall of the end building of a block of five or six houses and shops now being erected by Mr. James Whitaker at the corner of Clifton-road and Maida-vale gave way, bringing down the front and back walls also. The buildings,—ready to be roofed in,—are built of sound stock brick. The mortar, —mill-made,—seemed fairly hard in joints, but the ground is treacherous clay; moreover, the concrete under the walls had not hardened. Some suppose that there must be an old cesspool or drain under or near the new wall (an old house having previously occupied the site), for the front part of the party-wall has sunk down with a regular incline very considerably, and pulled away from the back part. There must have been a sudden collapse, for the wall,—18 in. thick in basement,—could scarcely have been gradually sinking to such an extent without being observed in time to shore up. An investigation should be made as to the cause: none of the other houses,—at the time of our visit,—appeared to be affected.

Since the above was written, and just as we go to press, we have received a copy of a report made by Professor T. Roger Smith, who, at the request of Mr. Whitaker, has made a survey of the property. In his report, which we cannot print *in extenso*, Professor Smith, after showing that there is nothing, either in the structure of the building or the nature of the materials, to account for the calamity, says,—

"A kind of dumb-well appears to have been formed to receive surface-water, and a tie-drain was taken from it to the drain in the street. The mouth of this drain is 5 ft. from the angle of the party and front walls, and 15 in. below the bottom of the concrete. This I saw exposed, and all the space round it for some distance is now a mass of very soft wet clay, and the clay round the footings of the party wall, when cut into, is found soft, and allows moisture to escape. There can be hardly any doubt that the surface-water making its way into this drain at so short a distance from the angle which has failed, and at so low a level, must have actually passed under the foundations of the wall, and have occasioned part of the clay below the foundations to slide on what lies below it. It is probable that a sudden slip of this sort took place, followed by the speedy subsidence of the wall and of the front and back walls connected to it; and that this is the reason of the suddenness of the accident."

Miscellanea.

The Surveyors' Institution.—A crowded audience assembled in the hall of this Institution on Monday evening to hear the opening address of the president, Mr. Edward Ryde. There was a very large number of applications for admission to the fellowship. The occasion was one of special interest, being the first meeting of the institution since its incorporation by royal charter. The President referred in terms of congratulation to the prosperous condition of the institution, which has now become the accredited representative of the profession; and afterwards called special attention to the clauses of the charter which provide for the examination of all classes of members admitted after certain dates. We hope to return to the address.

The Competition for the "Meade Memorial" at Philadelphia, U.S.A., is just concluded. The first prize has been awarded to W. Alex. Milne Calder,—who is at present executing the commission for the groups of sculpture upon the new public buildings in that city. In the model, General Meade is shown sitting easily upon a magnificent charger attentively watching the battle. Mr. Calder, who is a native of Aberdeen, and has been in the States some fourteen years,—receives one thousand dollars premium.

The Smoke Abatement Exhibition at South Kensington will be opened by the Lord Mayor. We are told that the east and west arcades, and the pavilions and quadrants around the Royal Horticultural Gardens, South Kensington, instead of affording a space which it was at first supposed would be but scantily filled, are found to be barely sufficient for those exhibits the executive committee have decided on admitting.

The Clarkson Memorial, Wisbech, was unveiled on the 11th inst., by the Right Hon. the Speaker. The memorial, which has cost about 2,000*l.*, has been erected by Messrs. Farmer & Brindley, from designs of the late Sir Gilbert Scott. We gave a view of it six years ago (see *Builder*, vol. xxxiii., p. 909).

Edinburgh Architectural Association. At the opening meeting of the Edinburgh Architectural Association, the president, Mr. John M'Lachlan, gave the inaugural address, the subject being "Notes on some Old Edinburgh Architects." He said they lived in a city of unsurpassed beauty, a beauty attributable in a great measure to its unequalled natural position, but due also in no small degree to the great beauty of many of its buildings. It was a matter of regret that, although the city owed a deep debt of gratitude to her architects, their names and memories had been treated with scanty regard. He had experienced the greatest difficulty in getting material for his address about architects who lived even so recently as within the last thirty or forty years. Mr. M'Lachlan then gave some very interesting notes on the local architects who flourished in Edinburgh since the commencement of the building of the New Town, and mentioned some of their chief designs in the city and elsewhere. Several designs by some of these architects were exhibited and greatly admired, and on the conclusion of the address the president received a vote of thanks. At the meeting of the association, held on the 16th inst., a paper on "The Building Stones of Scotland" (with specimens) was contributed by Councillor Gowans.

Illegal Building.—At Highgate, Thomas Watkin Smith, builder, of Hamilton-road, Finchley, appeared before Messrs. Bodkin, Bayley, Homan, and Minto, to answer two summonses taken out by order of the Finchley Local Board of Health, and charging him with not having used bars of wrought iron in the openings of the chimneys at six houses erected by him in Hamilton-road, Finchley, and with not having the chimney-breasts tied in with bars of wrought iron; the other summons charged him with placing timber or woodwork in these chimney-breasts. Mr. Stevens read a report from Mr. Brooking, the Board's surveyor, stating that since the adjournment he had examined the chimneys at one of the houses, and found that a piece of iron had been inserted at one of the openings, but the wooden bar had not been removed. Mr. Stevens asked for a substantial penalty to be imposed, otherwise it paid builders to run the risk. The Bench imposed a penalty of 5*l.* and costs on each of the two summonses, making a total of 14*l.* 14*s.*, and, in consequence of the attempted fraud, refused to allow defendant time for payment, a month's imprisonment in default being ordered in each case, the terms to be consecutive.

Messrs. Alfred Reed and Corney Grain, having completed their fifth year of joint management of their popular entertainment, have renewed their tenancy of St. George's Hall, Langham-place, for a term of years. Several improvements have been made during the autumn recess; the stage has been rebuilt and considerably lowered, a green-room built for the artists, and the general arrangements both before and behind the scenes have been materially improved. On Monday night, November 21st, will be revived the successful operetta, "Ages Ago," written by Mr. W. S. Gilbert, and composed by Mr. Frederick Clay, who has re-written portions of the music. This will be followed by an entirely new musical sketch, by Mr. Corney Grain, entitled "Out of Town."

The Clapton Orphan Asylum Building.—"General Booth," of the "Salvation Army," has secured this large building for 15,000*l.*, which will be accepted by the owner in fifteen annual instalments of 1,000*l.* The building will probably take nearly another 1,000*l.* for necessary repairs, alterations, and other work before it is fitted for its new purposes.

The Aquarium.—A series of grand international vocal and instrumental concerts has been commenced, under the conductorship of Sir Julius Benedict. A special feature at these series concerts will be the appearance of some of the best military bands from the Continent, and patriotic songs by 250 performers.

The New Tay Bridge.—The contract for the erection of the Tay Bridge has been given to Messrs. Arrol & Co., of Glasgaw. Mr. Arrol arrived in Dundee on Wednesday, and was engaged with Mr. Barlow, C.E., selecting sites for the erection of workshops, &c. Messrs. Arrol are also the contractors for the Forth Bridge undertaking.

The New Meat Markets at St. Helier's, Jersey, are now rapidly approaching completion. The roofs are glazed by Mr. Helliwell, of Brighouse, Yorkshire, on his patent imperishable perfection system of glazing without putty.

"The Glow" Stove is an open slow-combustion grate, recently patented by Messrs. Everitt & Barnard. It will be exhibited at the Smoke Abatement Exhibition, to be held at the South Kensington Museum this month. The bottom, as in all slow-combustion stoves, is closed in; below this, in the front, are a number of holes carrying a draught of air beneath and parallel with the surface on which the coal rests. These openings are connected with an air-chamber at the back of the grate, which chamber has an outlet immediately over the fuel. A "baffle" of fire-brick, reaching the front, and about 1 in. above the openings of the air-chamber, extends the full width of the stove, springing from the back at an angle of about 60°. The objects of this "baffle," which becomes red hot, are to form a combustion chamber in which smoke is consumed, to accumulate the heat, which would otherwise escape up the chimney, and to throw the accumulated heat into the room.

A Steeple Jack in Elsecar.—A piece of skilful work was done at the parish church here on Friday in last week, by Mr. Joseph Ball, the well-known steeple-jack, of Oldham. The spire, built in 1843, has been found to be out of repair, and the matter being placed in the hands of Mr. Ball, he commenced operations in the afternoon by erecting eight ladders, connected together, one at a time, as he rose from the churchyard to the weather-vane at the top of the spire, the time occupied from start to finish being only two hours and a half. After Mr. Ball's examination and report a new lightning-conductor is to be erected, and the spire restored by him.

Magdalen Bridge.—The proposal of the Oxford Local Board to rebuild and widen Magdalen Bridge is received with dismay, and no wonder it is so, by all lovers of one of our most beautiful and historical cities. The committee of the Society for the Protection of Ancient Buildings is preparing for signature a memorial to be presented to the Board protesting against the threatened defacement of this beautiful structure, believing, as it does, from the personal knowledge of several of its members, that the exigencies of traffic do not at present necessitate the re-building of the bridge.

Public Buildings for Leamington.—The Leamington Town Council have decided to apply to Parliament for an Act to confer powers for the making and collecting of rates and the creation of funds on mortgage or debenture bonds for the erection and maintenance of a new town-hall, public library, museum, school of art, and assembly-rooms. It is estimated that the proposed new buildings will cost 30,000*l.*

Theatrical.—It may be interesting to some of our readers to hear that Miss Ethel Pierson (Mrs. F. E. Randell) was last week presented with a handsome bracelet by the members of Mr. D'Oyley Carte's "Pinafore and Sorcerer" Opera Company, with which she was associated as *prima donna* for nearly three years. The bracelet is a massive gold one, and bears a flattering inscription. The name Randell (and Saunders) is well known to our readers.

Society of Arts.—The opening meeting of the session 1881-82 was held on Wednesday evening, when Sir Frederick Bramwell, F.R.S., chairman of the Council, delivered an address treating of a number of very important subjects, to which we may be able to refer hereafter. This week we have received enough matter in the shape of papers read at meetings to fill the whole of our columns.

Drawing in Board Schools.—The annual exhibition of drawings by scholars and pupil teachers in the schools of the School Board for London is being held during this week at the Saffron-hill School, Cross-street, Farringdon-road (near the Metropolitan Railway Station). The exhibition is open from 10 a.m. till 9.30 p.m. each day, and will finally close this (Saturday) evening.

The Committee of the Spanish Colonial Exhibition have selected the plan of Señor Latorriente, a Madrid architect, for the exhibition building, which is to be finished by January 1884. The exhibition is to be held in May of the same year. Belgium has secured the contract for the ironwork.

Northern Architectural Association.—Mr. John Tillman, F.R.I.B.A., of Sunderland, was on Tuesday last elected President of the Northern Architectural Association for the ensuing year.

New River Shares.—At the Auction Mart, on Wednesday, Messrs. Edwin Fox & Bousfield sold parts of a king's share in the New River at prices ranging from 94,000*l.* to 97,000*l.* per share. The income on each share last year was 2,400*l.* They also sold ten new 100*l.* shares (fully paid) at from 383*l.* to 394*l.* per share, the dividend being at the rate of 11*l.* 12*s.* 10*d.* per share, and ten annuities of 2*l.* 10*s.*, at 70*l.* each.

His Majesty Oscar II., King of Sweden and Norway, has been pleased to confer upon Mr. Josiah Griffin, secretary of the Surrey Commercial Dock Company, the Knighthood of the Order of Wasa, and the insignia of the Order have been conveyed to him by Count Piper, the Swedish Minister at our court.

Interlocking Bricks.—Mr. J. Pitt Bayly, architect, claims to have invented a new brick, that renders structures erected of them "gale proof," and also proof against the greatest possible strain; each brick is locked one into the other.

Masonry. — "The Cosmopolitan Masonic Calendar for 1882" (Geo. Kenning) gives lists of the lodges all over the world, and shows the wonderful extent of the craft at the present moment.

TENDERS

For the erection of the Queen Anne tavern, Crown-road, Fulham, for Mr. A. J. Christey. Messrs. Wm. G. Habershon & Fawckner, architects:—

Wheeler, Ravenscourt Park	£4,500	0	0
Benton, Buckingham Palace-road	4,043	0	0
Niblett, Highbury	3,838	0	0
Coles & Bates, Croydon	3,723	0	0
Rowles, Aston	3,678	0	0
Grant, Putney	3,648	0	0
Mattock Bros., Wood-green	3,614	0	0
Smith, West Brompton	3,597	0	0
Warr, Croydon	3,498	0	0
Lucas, Kensington	3,454	0	0
Lyford, Hammersmith	3,332	0	0
Ashford, Slough	3,280	0	0
Judd, Bow	3,183	0	0
Potter, Leicester	3,168	0	0
Oburn, New Kent-road	3,150	0	0
Allen, Kilburn (accepted)	3,090	0	0
Williams, Putney	3,090	0	0
Richardson, Clapham	3,078	0	0
Evans, Peckham	3,017	0	0
Blackmore, West Brompton	3,006	0	0
J. Higgs,* Upper Park-place	2,997	0	0
Higgs,† Loughborough Junction	2,993	0	0

* Too late. † Withdrawn.

For making new roads, footpaths, and surface water drains, on the British Land Company's Estate, Chigwell, Essex. Mr. Henry B. Michell, surveyor:—

Crockett	£1,033	0	0
Acock	1,025	0	0
Dunmore	954	0	0
Wilson	954	0	0
McKenzie	943	0	0
Keeble	926	0	0
Kilingback	920	0	0
Harris	915	0	0
Pull	900	0	0
Pizzey	898	0	0
Bloomfield	878	0	0
Jackson (accepted)	789	0	0

For house, at Carsick Hill, Sheffield (second design), for Mrs. Birks. Mr. Edward Robert Robson, architect:—

Ridal & Arnison	£5,465	6	10
Bromwich, Foster, & Co.	5,444	0	0
Chadwick & Co.	4,750	0	0
Wm. Bissett & Son	4,600	0	0
Job Stone	4,574	0	0
Tomlinson & Son (accepted)	4,490	0	0

For villa residence, Norbiton Park Estate, New Malden, Surrey, for Mr. R. B. Matthews. Mr. T. L. Heward, architect. Quantities supplied:—

Turtle & Appleton	£1,135	0	0
William Lane	929	0	0
D. S. Rice	879	0	0
William Johnson	782	0	0
Joseph Saunders (accepted)	777	0	0

For repairs to thirty-two houses at Kentish-town, for the Rev. Mr. Blew. Mr. Walter Barnett, architect:—

Pusey & Lumley	£716	0	0!
Parsons	700	0	0
Hewlitt	695	0	0
Spencer & Co.	670	0	0
Stevens Bros.	482	0	0
Gentry	398	11	0!

For mahogany work at Leadenhall House, Leadenhall-street. Mr. J. Lewis Holmes, architect:—

G. Kirk	£113	10	0
Hewlitt	104	0	0
Somerville & Smith	102	13	5

For Hatfield Lockup, Hertfordshire. Mr. Urban A. Smith, architect:—

E. Twelvetrees	£7,585	0	0
Thos. Hunt	6,775	0	0
Gibbons & Co.	6,597	0	0
J. Angood	6,500	0	0
Glasscock	6,293	0	0
Wilmott & Son	6,196	0	0
Scales & Norris	6,175	0	0
W. J. Beale	5,977	0	0
Wade & Edey (accepted)	5,370	0	0

For the erection of a new Congregational Chapel, at Pentrebirth, near Guilsfield, Montgomeryshire. Mr. R. Hurst, architect:—

C. T. Pugh, Welshpool	£235	0	0
D. P. Jones, Welshpool	235	0	0
John Pickstock, Myford	233	12	0

For works on the estate of Miss Rooncherett, Stallingborough, Lincolnshire. Mr. James Whitton, architect:—

Contract No. 1.—Alterations and additions to Mr. Wright's House.

R. H. Dunkley, Eastville	£398	0	0
Hunter & Son, Spilsby	385	0	0
Thompson, Keelby	374	5	4
Crossby & Sons, Lincoln	371	0	0
Sutton, Scanby	366	11	0
Harrison, Market Rasen	360	0	0
Morgan, Lincoln	359	0	0
Miller, Sotby	355	0	0
Allison & Son, Stallingborough	354	10	0
Turner, Wainfleet	352	0	0
Jewitt, Stallingborough	340	0	0
Horton, Lincoln	339	0	0
Riggall & Hewins, Grimsby	336	5	0
Waddingham, Habrough	332	0	0
Kendall, Market Rasen	329	15	0
Shelton, Stallingborough	314	5	0
Hobson, Hogsthorpe (accepted)	269	0	0
Thompson, Louth	244	0	0

No. 2.—Alterations and Additions to Mr. Addison's House and Farm Buildings.

R. H. Dunkley, Eastville	£680	2	0
Hunter & Son, Spilsby	660	0	0
Crossby & Sons, Lincoln	640	0	0
Allison & Son, Stallingborough	613	2	0
Sutton, Scanby	613	2	0
Morgan, Lincoln	596	11	0
Riggall & Hewins, Grimsby	590	0	0
Miller, Sotby	586	15	0
Thompson, Keelby	583	17	8
Harrison, Market Rasen	580	0	0
Horton, Lincoln	579	0	0
Thompson, Louth	575	0	0
Hobson, Hogsthorpe	570	0	0
Turner, Wainfleet	568	10	0
Shelton, Stallingborough (accepted)	533	7	8
Kendall, Market Rasen	540	10	0
Waddingham, Habrough	545	0	0
Jewitt, Stallingborough	539	10	0

No. 3.—New Buildings on Mr. Parkinson's Farm.

Allison & Son, Stallingborough	£476	0	0
Riggall & Hewins, Grimsby	452	5	0
Morgan, Lincoln	349	12	6
R. H. Dunkley, Eastville	295	6	0
Crossby & Sons, Lincoln	293	0	0
Hunter & Son, Spilsby	290	0	0
Thompson, Keelby	288	8	0
Thompson, Louth	283	15	0
Turner, Wainfleet	278	0	0
Jewitt, Stallingborough	271	10	0
Horton, Lincoln	270	0	0
Kendall, Market Rasen	269	19	0
Miller, Sotby	265	12	0
Hobson, Hogsthorpe	264	0	0
Waddingham, Habrough	261	2	0
Shelton, Stallingborough	260	2	6
Harrison, Market Rasen (accepted)	256	0	0
Sutton, Scanby (withdrawn)	203	16	0

No. 4.—New Buildings on Mr. Taylor's Farm.

Morgan, Lincoln	£256	9	0
R. H. Dunkley, Eastville	245	10	0
Crossby & Sons, Lincoln	243	0	0
Hunter & Son, Spilsby	242	0	0
Allison & Son, Stallingborough	238	15	0
Horton, Lincoln	234	0	0
Thompson, Louth	238	15	0
Turner, Wainfleet	235	0	0
Thompson, Keelby	231	8	8
Kendall, Market Rasen	219	19	0
Miller, Sotby	219	13	0
Hobson, Hogsthorpe	219	0	0
Riggall & Hewins, Grimsby	217	11	0
Harrison, Market Rasen	217	0	0
Shelton, Stallingborough	216	0	0
Waddingham, Habrough	205	0	0
Jewitt, Stallingborough (accepted)	201	9	7

For alterations and additions to the Metropolitan Music Hall, Edgware-road, for Mr. H. G. Lake. Mr. J. H. Taylor, architect. Quantities by Messrs. New & Son:—

Mark	£1,388	0	0
Temple & Forster	1,275	0	0
Cowland Bros.	1,175	0	0
Hook (accepted)	1,145	0	0

For alterations and additions to 102, 104, and 106, Norfolk-terrace, Notting-hill, for Mr. W. Mardell. Mr. J. H. Taylor, architect:—

Thos. Mardell (accepted)	£1,920	0	0

For completing houses at Mitcham. Mr. J. H. Taylor, architect:—

Backholer	£194	0	0
Preece	191	10	0
Marks	160	0	0
Handover	159	0	0
Munt	111	7	11
Sanders (accepted)	110	0	0

For sundry repairs and reinstatements, at 1 and 2, Manchester-terrace, Kensal New Town, for Mr. F. Allum. Mr. J. H. Taylor, architect:—

Middleweek	£165	0	0
Backholer	150	0	0
Lamble	150	0	0
Cooper	145	0	0
Handover (accepted)	120	0	0

For works in laying drain to connect drains of houses Nos. 1 to 7 (inclusive), Vaughan-villas, Devonshire-road, Forest Hill, Lewisham, for Messrs. J. Vaughan, Bratteli, and T. G. Coldham. Messrs. Ebbetts & Cobb, architects:—

Cowland, Bros.	£187	0	0
W. Holt	107	18	4
Kellett & Bentley	88	12	0
F. Blossom	84	17	0
H. Baylis	84	10	0
T. Lantoff	79	10	6
D. King	78	0	0
Laugler & Pinkham	75	0	0
Steel, Bros. (accepted)	65	0	0

For repairs to farm buildings, at the Rhalls, near Welshpool, for Mr. M. C. Jones. Mr. Hurst, architect:—

D. P. Jones, Welshpool	£147	11	0
C. T. Pugh, Welshpool	133	0	0

For sewer works between Greyhound-lane and the Wandle branch sewer, Streatham, for the Metropolitan Board of Works. Sir Joseph Bazalgette, engineer:—

J. J. Nobbs	£1,276	0	0!
W. Crockett	1,260	0	0
Thos. Blackmore	1,220	0	0
Goodyer	1,202	0	0
Wm. Avis	1,160	0	0
Cook & Co.	994	0	0
Nowell & Robson	990	0	0
Williams, Son, & Wallington	980	0	0
Geo. Bath	900	0	0
Thos. Rigby	877	0	0
S. Chafen	840	0	0
Wilkins & Co.	787	0	0
Ford & Everett	760	0	0
Bottoms Bros. (accepted)	740	0	0!

For proposed new roads, sewers, &c., on the Great House Estate, Leyton, for Messrs. Meikle & Passmore:—

Crockett, Battersea	£2,887	0	0!
McKenzie, London	1,445	0	0
Dunmore, Hornsey	1,375	0	0
Harris, Camberwell	1,081	0	0
Keeble, Regent's Park	1,070	0	0
Wilson, Walthamstow	1,063	0	0
Peill, Bromley, Kent	1,055	0	0
Acock, London	1,048	0	0
Bloomfield, Tottenham	1,020	0	0
Pizzey, Hornsey	975	0	0
Jackson, Leyton (accepted)	963	0	0!

For lowering, widening, sewering, metalling, &c., a portion of Shepherd's Hill-road, Hornsey. Mr. T. de Courcy Meade, surveyor:—

James Pizzey, Hornsey	£1,296	0	0
McKenzie, Williams, & Co., Moorgate-street	1,188	0	0
J. Rowley, Tottenham	1,170	0	0
Strachan & Co., Wood-green	1,099	17	0
Jackson & Sons, Finsbury Park	1,095	0	0
Alfred Walker, Upper Holloway	1,089	0	0
W. J. Dunmore, Crouch-end	1,073	0	0
Randell & McDowell, Shacklewell	1,060	0	0
Ford & Everett,* Westminster	866	0	0

* Accepted.

For alterations and additions to Brown's Hotel, 21 to 24, Dover-street, Piccadilly, for Mr. J. J. Ford. Mr. Charles Sewell, architect. Quantities by Mr. S. J. Thacker:—

Bywaters	£8,945	0	0
Adamson & Sons	8,573	0	0
Fish	8,490	0	0
Young, Cochrane, & Fraser	7,950	0	0
A. Scott	7,573	0	0
John Morris, Park-street, W.	7,530	0	0

For the erection of a pair of cottages, on the Imberhorne Estate, East Grinstead, for Mr. Edward Blount. Mr. S. W. Haughton, architect. Quantities by the architect:—

J. Longley, Turner's Hill	£1,128	0	0
G. & F. Penn, Pembury	1,043	0	0
Charlwood Bros.,* East Grinstead	875	0	0

* Accepted.

For the erection of a cottage, and repairing an existing one, Marsh-green, Kent, for Mr. J. T. Morton. Mr. S. W. Haughton, architect:—

H. Wallis, Lingfield	£246	10	0
J. Waters, Forest-row	184	0	0
Charlwood Bros.,* East Grinstead	139	0	0

* Accepted.

For the erection of a house and shop, West Hoathly, Sussex, for Mr. W. V. K. Stenning. Mr. S. W. Haughton, architect:—

Thos. Jupp,* West Hoathly	£285	0	0

* Accepted.

For the erection of a new house and offices at Crouch-end, for Mr. John Smith. Mr. T. E. Collcutt, architect:—

	House, including fence.			Boundary fence.		
Wheeler	£2,376	0	0	£167	0	0
Holliday	2,375	0	0	149	0	0
Williams & Son	2,345	0	0	140	0	0
Stimpson & Co.	2,133	0	0	155	0	0
Julian & Co.	2,080	0	0	121	0	0
Nightingale	2,019	0	0	136	0	0
Taylor & Parfitt	1,999	0	0	112	0	0

Accepted for a villa residence, at Streatham. Mr. Wm. Paice, architect:—

W. H. Smith	£375	0	0

For alterations, additions, and repairs, at 59, Russell-square. Mr. Wm. Paice, architect:—

W. H. Smith (accepted).

For new roads and sewers, for Mr. H. Bragg, at St. John's-hill, Clapham Junction. Mr. Charles J. Bentley, surveyor:—

	Plan A			Plan B		
John Ball	£1,018	3	0	£1,036	15	0
Blackmore	825	0	0	980	0	0
James Neal*	740	0	0	870	0	0
R. & G. Neal	730	0	0	995	0	0

* Accepted for Plan B.

For sewers and hard core for roads, for Mr. J. W. Everidge, Dent's House Estate, Wandsworth-common. Mr. Charles J. Bentley, surveyor:—

	Sewers.			Hard Core.		
R. & G. Neal	£700	0	0	£180	0	0
Mears	626	0	0	220	0	0
James Neal	575	0	0	192	10	0
Harris	567	0	0	212	0	0
Hampton	533	0	0	187	0	0
W. R. Williams*	498	0	0	187	0	0

* Accepted.

For new roads and sewers, for Mr. F. Snelling, on the estate of the late Mr. Tom Taylor at Lavender-sweep, Battersea-rise. Mr. Charles J. Bentley, surveyor:—

W. R. Williams	£1,060	0	0
John Ball	1,030	0	0
Harris	900	0	0
Nowell & Robson	820	0	0
R. & G. Neal	790	0	0
Blackmore	790	0	0
James Neal	780	0	0

For shop, at Egham. Mr. John D. Wood, architect:—

J. Smith & Sons	£1,427	0	0
Simpson	1,421	0	0
Messom	1,375	0	0
Wadey	1,333	0	0
N. Lee	1,295	0	0
G. Reavell	1,275	0	0
J. L. Oades & Sons	1,263	0	0
Seal Bros.	1,259	0	0
E. & E. Evans	1,235	0	0
J. Higgs	1,197	0	0
G. Parker	1,179	0	0
F. Warr	1,157	0	0
F. Higgs	1,152	0	0

For new stables, Pennyhill Park, Bagshot. Mr. H. Pettit, architect:—

Norris	£3,387	0	0
Boyce	3,273	0	0
Holland & Hannen	3,267	0	0
Nightingale	3,195	0	0
Lawrence	3,150	0	0
Knight & Sons	3,080	0	0
Stimpson & Co.	3,045	0	0
Watson	2,931	0	0

For the erection of house in Nightingale-lane, Clapham common. Mr. Sanctou Wood, architect:—

Hall & Beardall	£4,290	0	0
Patrick	4,098	0	0
Thos. Ryden	3,788	0	0
Chappel	3,750	0	0
Brass	3,693	0	0
Colls & Sons	3,570	0	0
Dove	3,545	0	0
Stimpson & Co.	3,187	0	0

For alteration to stabling, &c., in Warwick, for the Leamington and Warwick Tramways. Mr. E. Pritchard, engineer:—

Robbins, Warwick	£226	0	0
Feil, Leamington	212	0	0
T. Green, Warwick	180	0	0
Cotterill, Birmingham (accepted)	179	0	0

Accepted for pulling down and re building the Duke of Gloster, Deacon-street, Walworth, and three houses adjoining, for Mr. Joseph Burkett. Messrs. Jarvis & Son, architects:—

Builder's Work.

Gill	£4,400	0	0

Counter and Pewterer's Work.

Mathews	246	0	0

Gasfitting.
Wion.

For the erection of farm buildings in Staines-road, near Stanwell, for Mr. Dudley Albert Hambrough. Mr. Thos. Newell, architect:—

Browning & Son	£638	10	0
Nye (accepted)	613	0	0

For finishing pair of semi-detached villas, at Southall. Mr. Thos. Newell, architect:—

Gibson	£895	0	0
Burgess & Co.	631	15	4
Browning & Son (accepted)	537	0	0
Wells	534	0	0

For labour only in erecting seven cottages, at Hayes Bridge, near Southall, for Mr. F. Newell. Mr. Thos. Newell, architect:—

Moore	£455	0	0
Burgess & Co.	450	0	0
Perks & Wells (accepted)	445	0	0
Stacey	315	0	0

For new shop-front, alterations, and additions to premises, High-street, Southall, for Mr. E. Harvey. Mr. Thos. Newell, architect:—

Nye	£490	0	0
Hardy	465	0	0
Brown	450	0	0
Gibson (accepted)	395	0	0

For proposed alterations and additions at the Grange, Brook-green, Hammersmith. Mr. F. Pinches, architect:—

				Extra for Keene's Cement.			
Macey	£5,130	0	0	£289	0	0	
Colls	4,570	0	0	300	0	0	
Adamson	4,490	0	0	180	0	0	
Thorne	4,400	0	0	165	0	0	
C. Wall	4,314	0	0	160	0	0	
Stimpson & Co.	4,230	0	0	105	0	0	
Knight	4,209	0	0	154	0	0	

For the erection of a block of Artisans' Dwellings and alterations to 23, Kingsland-road. Mr. W. D. Church, architect:—

Hughes	£5,220	0	0
Gordon	5,094	0	0
Boyce	4,900	0	0
Morter	4,777	0	0
Woodward	4,700	0	0
Pack Bros.	4,410	0	0
Ashby Bros.	4,430	0	0
Steel Bros.	4,370	0	0
Tyerman	4,335	0	0
Stimpson & Co.	4,223	0	0
Sabey	3,700	0	0

For the erection of new schools at Walnut-tree-walk, Lambeth, for the London School Board. Mr. E. R. Robson, architect:—

Lathey Bros.	£6,911	0	0
Higgs & Hill	6,492	0	0
J. Marsland	6,345	0	0
S. J. Jerrard	6,343	0	0
B. E. Nightingale	6,178	0	0
Stimpson & Co.	6,148	0	0
C. Wall	5,990	0	0

For alterations and repairs to Christ Church Schools, Hampstead, for the Committee. Mr. C. A. Legg, architect:—

J. Eanor Julian & Co. (accepted).

For alterations at No. 61, Green-street, Bethnal-green, for Mr Mardoy. Mr. C. A. Legg, architect:—

F. & F. J. Wood	£432	0	0
Judd	341	0	0
Elves	340	0	0
Lusk	332	0	0
Parrish (accepted)	320	0	0

For the erection of new Sunday Schools, in rear of Congregational Chapel, Asylum-road, Peckham. Mr. J. Wallis Chapman, architect. Quantities by Messrs. Goodchild & Son:—

Jerrard	£1,530	0	0
Woodward	1,519	0	0
Taylor	1,137	0	0
Tarrant	1,394	0	0
Rickett	1,280	0	0
Pack Bros. Brixton (accepted)	1,198	0	0

TO CORRESPONDENTS.

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The Builder.

VOL. XLI. No. 2095. SATURDAY, NOVEMBER 26, 1881.

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New Admiralty and War-Office Buildings.

FEW persons will be likely to dispute the propriety of the resolve, which, in a very straightforward manner, has been announced by the Government, no longer to allow our great Ministries of War and of Marine to seek shelter for their official staff in a series of private houses, wholly unfitted for the orderly transaction of the business of these important departments. The only possible objection at which the official circular hints, that of cost, if properly looked at, applies, not to the new buildings, but to the maintenance of the present makeshift. Costly, indeed, has that proved to be in more ways than one. Irritating as is the loss of time occasioned by such an imperfect distribution of clerks and heads of departments; hostile to the orderly, and thus to the efficient and economical, transaction of business as it has been long admitted to be, we have paid yet a heavier tax for our neglect. We need not here recall the names of those whose loss has been lamented in our own columns,—public servants not easily to be replaced, who have sunk victims to the unsanitary condition of the substitutes for ministerial buildings. And we have a word or two to say as to the primary caution against the perpetuation of this evil in the new building.

Nor is it with regard to the sanitary provisions for the new building alone that we see some ground for anxiety. We confess to certain qualms that are raised by one expression in the circular issued by the First Commissioner of Works,—which, to the lay or non-architectural reader, may seem only to point out an obvious requisite. So obvious, indeed, to the architect is the principle that plan should regulate, rather than depend on, elevation, that to dwell too much on the fact seems rather to intimate that architecture is regarded, not as a structural, but as a decorative art, and that it is one thing to arrange a building with due regard for its proper purposes, and another to adorn it with an *appliqué* façade. It is unnecessary to insist, in speaking to our own readers, on the mischief that cannot fail to arise from such a thorough misconception of the functions of the architect. Nothing can more surely lead to what we may call pictorial failure, than the idea that "architectural features," and "interior arrangements," may be independent of, or hostile to, one another. "It is intended," says the official circular, "that the architectural features of the new building shall be subordinate to its main purpose of a great public office, and not the determining cause of its interior arrangements; but the frontage to Whitehall, and that looking up the Mall, will afford opportunities for well-proportioned and handsome façades."

The hesitation that we express as to this sentence is not owing to any idea that plan should be sacrificed to elevation. Nothing can, indeed, be more truly unarchitectural. To place a triumphal arch, or some equally useless bit of work, as a central feature, and to allow the business arrangements of the place to sneak as best they may around the base of such a monumental centre, would be a piece of folly, not perhaps without precedent, but against which we trust that it is really unnecessary in the present day to protest. But the point on which we insist is, that the "interior arrangements" of a great public office are, if properly designed and carried out, eminently "architectural features." It is from the adequate design and fitness of such features for the main purposes of great public offices that the true organisation of the whole edifice must grow. "Well-proportioned and handsome façades" are not to be stuck on a pile of offices as something independent, as mere decoration, employed like a coat of paint or of stucco. If the façades do not find their motive in proper interior arrangements they will be nothing but shams, and, therefore, nothing but failures. What is wanted, and what the nation and the age demand, is, not a nest of rooms with here and there a façade stuck on, but a fitting and noble building, a whole and complete work, well designed, both as respects accommodation and appearance.

The first point to inquire into is, What are the main requisites for such a public building as on the Continent would be called by some name equivalent to the English word "Ministry"? Of these we have abundant examples in Paris, Vienna, Naples, St. Petersburg, and other Continental cities. And in face of that prevailing misconception of the true nature of architecture as to which the Ministerial circular only too truly represents the general tone of lay feeling among us, it might be useful to obtain plans and elevations of such of these buildings as best answer their business ends, as well as best fulfil their architectural requirements, in the various European capitals; and to exhibit them in some convenient locality when the matter is brought before Parliament. There would then be some chance that the debates which are sure to occur will not be wholly ignorant and purposeless.

The leading requisite of the buildings, we venture to suggest, will be the collocation under the same roof of a sufficient number of distinct apartments to provide for the whole staff of what, in other countries, would be called the Ministries of War and of Marine. There is no reason, of which we are aware, for any great variety in the size and distribution of these rooms. Interior courts, as mentioned in the circular, will be necessary for the purposes of lighting and ventilation. This will involve the construction of one or more *portoni*, or carriage-entrances, which will naturally form central features in the façades, relieving the otherwise too great repetition of the numerous windows by their deep shadow. Bold and rich decorative features may well adorn such principal entrances; and a great staircase, or pair of staircases, will also afford occasion for the display of a true architectural taste.

One difficulty, as far as our experience goes, in the distribution of the buildings, is that of lighting the corridors. Not only on account of the value of the site, but for the sake of official convenience, the buildings will have to be in three or more stories. The lighting of the corridors will thus be impracticable in the best mode,—that is to say, by skylights, except in the top story. End windows, no doubt, will be introduced; but the light thus obtained is both feeble and dazzling to the eye in a long corridor; and the use of borrowed light from the rooms on either side, which always gives a gloomy and prison-like effect in London, in certain states of the atmosphere, can only make darkness visible. The expedient of artificial light during the day, which has been adopted in one very ugly but very commodious Ministry in Italy with which we are familiar, is objectionable on many grounds. Considering the revolution now in progress in the practice of illumination, especially as illustrated in those American cities to which we recently called attention, it may be hoped that the danger and evil odour which are too apt to attend on the introduction of gas may be avoided in the new buildings.

The elevation of the Palace at Stockholm (apart from the arrangement of the approaches, which would be inappropriate to the London site), is one to which we call attention as likely to suggest, at all events, very useful hints for the design of the new Ministries. In the simplicity and grandeur of the whole design, in the opinion of very competent judges, this building stands unrivalled among the palaces of Europe, with the single exception of the Palazzo Farnese at Rome; and in some respects its proportions are even better than those of the latter edifice. And it has especially to be borne in mind that Nicolas de Tessin, who built this palace for King Charles XII., was here unusually happy in the adaptation of architectural forms to a Northern climate. In the garden front and in the cortile of the Farnese Palace, in the arcade of the Barberini Palace, another Roman example, in the elevation of the Chiericate Palace at Vicenza, in the proportions of the Doria Palace at Genoa, in the wings of the Durazzo Palace, in the same city, and in not a few other noble Italian examples, the adaptation of the building to a Southern climate is so evident, as to render the reproduction of any similar elevation in London simply ridiculous. The Palace at Caserta would be less liable to this objection. But in this the basement story is so evidently sacrificed to the grandeur of the *piano nobile*, or first-floor, as to be hardly appropriate for our habits. Still, Caserta is a

very noble building, and is an example of the effect of mass and of repetition rather than of richness of detail, in producing the impression of grandeur. But the Ionic pilasters at Caserta give unreality to the elevation. The Glyptothek at Munich, the Ruhmes Halle, near Munich, the Museum at Berlin, and we may, perhaps, add the Town-hall, Antwerp, are examples of those styles of building which (whatever may be their excellence in the localities and for the objects cited), it becomes the London builder carefully to eschew.

The area covered by the Stockholm Palace is about 144,000 square feet, of which nearly half is open court. For the Whitehall buildings 112,000 ft. of building space are mentioned by the Circular as afforded by the area.

Of course we want no reproduction. We point to these structures as examples that at once occur, worthy to be considered by those architects who will be called upon or invited to submit designs for the new buildings.

We make, with all reserve, another suggestion. Shelter for carriages is now a necessity for any great London building. It has been recently attained, in some instances, as is the approach to the Paddington Station, by a glass roof, which, however comfortable, can hardly be regarded as ornamental. Too much space would be lost at Whitehall by the introduction of an outer court, such as that now existing at the Admiralty; and, as before hinted, a *portone*, giving access to the central court, will no doubt be adopted in the new building. We do not see why the whole central court should not be protected by a glass roof, raised high enough above the roofs of the sides of the quadrangle to allow of free ventilation, and of the admission of some pure light, yet adequate to keep the inner court from being drenched. And in case of the adoption of this convenience, which it was not within the power of the great French and Italian architects to command, it is at least worth consideration how far the same shelter might be utilised for overcoming the difficulty before mentioned as to lighting the corridors.

The main buildings, no doubt, will contain two apartments in width. The difficulty is as to lighting the corridor, if placed in the midst. There are yet, we fancy, extant, picturesque examples of the manner in which this difficulty was overcome in Old London, to be found in some of the inns in Bishopsgate-street. The mode is not unfamiliar in the south of Europe. We remember examples at Avignon. It might be worth while, at all events, to try upon paper how far the requisite conditions of access, shelter, and light might be secured by internal galleries, open on the courtyard, only supported by such structures as would be necessary for solidity, reached by external staircases, under the same shelter, and giving access to one set of rooms, which would be lighted from the side of the gallery, while the second set would be lighted from the external wall. That the inner row would form ante-chambers, giving access to the outer rooms, would in most cases be rather convenient than otherwise; and in the case of the rooms of the Minister, the Commander-in-Chief, or the heads of departments, a separate entrance could be easily arranged, either by short corridors opening on the gallery, or even by private staircases. As to this, it is to be understood we are not speaking further than to suggest the idea to the consideration of the architect.

On one point, however, we speak without any reserve. It is one to which we have on former occasions called attention; and as to which, if due attention is not now given to the matter, we venture to say that the concentration of the occupants of the thirty-eight houses now filled with the officials of the War Office and the Admiralty will only be a concentration of ill-health. We refer, of course, to the sewerage of the area on which the new offices are to be erected. We urge all those who are responsible for, or who take an interest in, the health of our officials in these great departments, to consult the twenty-fourth volume of the Minutes of Proceedings of the Institution of Civil Engineers. At page 280 they will find a paper on the main drainage of London, which was read by Mr. (now Sir) J. W. Bazalgette to the Institution on March 14th, 1865. On plate 17, which illustrates this paper, they will find a section of the Thames Embankment, showing the sewer miscalled the "low-level sewer," which drains, or rather does not drain, the site of the new buildings. The centre line of this sewer is only 13 ft. 6 in. below the high-water line, and is consequently from 7 ft. to 10 ft. above the low-water level at which the ancient sewers of Westminster made their escape into the river. The consequence of this most disastrous choice of level has been the penning back of an unknown amount of damp, wet, and old,—if not recent,—sewage over the whole area between the Thames and the Park. To this, to a considerable extent, the unsanitary state of the present Government offices can be traced; and to this, unless the matter be at once looked in the face, will the future ill-health of the occupants of the new buildings be attributable. Near Chelsea Hospital, as will be seen on the plan accompanying the paper in question, is a lift, which raises the sewage of an area of about eleven square miles to a height of 17 ft. 6 in. It is this very lift which is fatal to the salubrity of the most important district of London. At Marlborough House the difficulty has been met, we believe, by a special lifting apparatus. It is not for us to decide how it should be met in the case of the Admiralty and War Office. But we give fair warning to all concerned that if the new buildings are erected without looking this terrible evil in the face, they will prove nests of enteric fever. From Charing-cross, under the Mall, and down Grosvenor-road, to the sewer below the lift,—below, that is to say, in level,—measures a couple of miles on the map. Whether the really "low level" sewer would be able to take that fresh contribution to its contents we are, of course, unable to say. But unless by this or by other means a true low-level drainage be now substituted for that which exists in this part of Westminster, it needs no prophet to foretell evil, rather than good, from any concentration of the officers of the Government under the same roof.

We trust that the matter will be taken up in a becoming spirit, free either from crotchet, from party feeling, or, above all, from ignorant optimism. Of points of style and taste we are unwilling to speak. It will generally be held that the character of the Whitehall Banqueting-house must necessarily to a great extent limit the choice of the architect. But on the two distinct points,—first, that we require a complete building, not a parcel of rooms with a façade or two stuck on; and secondly, that sanitary safety of the foundation ought to precede building,—we feel that it is impossible to insist too strongly. We sincerely trust that all those minor points on which great differences of opinion are likely to arise will be kept in abeyance until the propriety of attending to these two primary requisites is fully admitted, and not only so, but practically carried into effect.

THE PROFESSION AND THE PRESS.

The address of the President of the Royal Institute of British Architects, reported in our pages, has awakened in the daily press what may be called a series of Irish echoes. A speaker occupying the position of the President has the advantage of both a scientific and a practical knowledge of the subject with which he deals, which he is by no means called upon to advertise or to magnify, but which forms the very atmosphere of his thought. The writer in the daily press, devoid of this special information, and very probably destitute of any special scientific or practical training of any kind, is at an unusual disadvantage when he takes upon him to comment on the language of one of the leaders of any liberal profession. The journalist may feel,—as we all do,—the pressure of much that is inconvenient, much that is to be lamented. But he is unaware either of what has been done, of what is doing, or of what it is practicable and desirable to do in the way of amendment. Thus his column of leaded type is little more, very often, than a sort of school-boy essay, in which there may be what is true, and even what is brilliant, but of which the outcome, if full of "sound and fury," none the less "signifies nothing."

Thus such a statement as that "at no period, it may be safely asserted, was the average English house less well adapted for attaining the main object which Mr. Street boasts English architects have particularly compassed" may be left to shine by its own light. Small wonder that the unscientific press has not, in this country, either the power or the status that it has attained in France, when it lends some of its oldest organs to such repeated attacks on an entire profession as we have before now had to mention with small favour in our columns.

There are now, in England and Wales, considerably more than three times as many inhabited houses as there were in the year 1800. In the month of May last, nearly 47,000 houses were in course of erection. Between April 4th, 1881, and April 3rd, 1871, 575,000 had been added to the number of our inhabited houses. Any person who has had occasion to travel through almost any part of England has the opportunity of noting the change that the last forty or fifty years has effected in our architecture, public, urban, and rural. Of the ten thousand churches reared since 1840, which have been either newly built or restored at a cost hardly less than that of rebuilding, we have before spoken. Since the passing of the Education Act the voluntary efforts of members of the Church of England have provided school accommodation for 935,993 additional children, making a total of 2,301,073. The Board schools have provided accommodation for 1,016,464 children. The Roman Catholics have increased their former school-room from 101,556 children to 242,403, or nearly two and a half times. The British, Wesleyan, and other schools have enlarged their limits from 411,948 to 582,403. Thus in the nine years following the passing of the Act, the English architect has provided school-room for 2,263,640 children, more than doubling the accommodation which existed in 1870, for 1,878,584 children, and bringing up the total accommodation to the amount of 4,142,224.

It is not only in the thousands of steeples and towers that dot our landscapes, or in the gables and porches of our thousands of new and generally picturesque schools, that the architect has been of late transforming the face of the country. What are the cottages of the poor now compared to their condition at the commencement of the century? Let any one recall what cottages were even forty years ago. What were those on the estates of the Duke of Rutland, in Derbyshire; of the Duke of Bedford, in Bucks; of the Marquis of Ailesbury, in Wilts,—of almost any great landowner? And what are they now, when an architect has been employed? The change is a positive transformation. We have an official record that throws some light on the growth of domestic architecture during the present century. That growth has been about 5 per cent. in advance of the growth of the population, something in the way of improvement, if not much. In 1800 there were 564 inhabitants to every 100 houses. In 1880 there were 537 inhabitants to every 100 houses. We take no note, in either case, of houses uninhabited or in course of building. In 1800 the uninhabited houses in England and Wales amounted to 3·1 per cent. of the inhabited houses. In 1880 the proportion had risen to 7·8 per cent. When we compare the visible improvement in size and accommodation which has taken place in both urban and rural domestic architecture with the facts that there are 4·8 per cent. fewer inhabitants in every average house, and that there are more than double the proportion of empty houses from which to choose a residence, it will, we think, be tolerably clear that the accommodation for the individual now offered is in advance of that which was the case at the commencement of the present century; and, where an architect has been employed, an advance also in the direction of comfort.

There is one style of journalism with which we have no sympathy. It is the style of the hopeless grumbler. It is pleasing, no doubt, to many people, or it would hardly be so often adopted as is the case. But we confess a grave doubt as to the utility of the purely critical in journalism. To point out faults is all very well,—if it lead to remedy; otherwise it has rather a demoralising tendency. One writer, as our readers will remember, was for imparting a new and sudden perfection to our "vernacular architecture" by the simple plan of turning all the architects adrift, and putting their work into the hands of the "inspired workman." Our own opinion points in diametrically the opposite direction. And we candidly appeal to those men who have the best opportunity of arriving at the truth,—architects who are largely consulted by intending purchasers or lessees of houses, or inspectors of metropolitan and urban districts. What is the general inference to be drawn from the cases of bad design, bad materials, and bad execution, which are constantly attracting the attention of such competent judges? May they not, nine times out of ten, be summed up in the remark,—absence of the control of a competent architect?

The speculative builder has generally enough

knowledge of his business to be aware that, as far as its legitimate exercise goes, it is a false economy to try to substitute uneducated agents for proper architectural control. He knows, well enough, that the services of a thoroughly competent architect will repay the amount of his commission over and over again. It is not for that cause that the jerry builder is his own architect. The saving that he strives to effect is a saving of that kind known as scamping. At every turn and corner of a house, from the sewers to the chimney-pot, it is possible to effect a considerable and a shameful economy. Bad materials, mud in lieu of mortar, bats instead of bricks, sappy wood, inferior slates, pipes badly laid, lath-and-plaster partitions instead of internal walls, shells of houses which, when by any chance a section is opened to the eye, bear about the same proportionate thickness to the interior of the house that the thickness of an egg-shell does to the volume of the egg. These are the points in which the unscrupulous builder saves outlay at the cost of the future inhabitant. These are the things which no respectable architect will sanction, and that is the true reason why his services are dispensed with.

We wish to keep this matter clearly before the public. In all occupations in a civilised state of society there are the higher and the lower grades. In the higher grades are to be found not only the practical experience collected throughout all the grades, but more complete education, and greater command of the whole subject. It has, therefore, been found, as a rule, to pay to engage the services of the highest grade; the higher price paid for it being, in point of fact, an economical outlay. Thus the barrister, the physician, the expert of all kinds maintains his position and his fees, because it is for the public interest, as shown by experience, that he should do so. Money out of pocket may be saved by taking a quack prescription to a chemist, instead of consulting a physician; by applying to that lawyer who, as the proverb says, has a fool for his client, and so on. But the saving turns out a loss. So it is, notably, in the craft and art of the builder, where supervision of a thorough and incorruptible kind is of the utmost value. You may need a physician once in four or five years; a lawyer once in ten; but you need a house every day and all day long. The counsel of the barrister or of the physician is given on a stated case, and there an end. The eyes of the architect, in person or in deputy, should be on every brick and every plank that is laid, while the house is in building. Therefore, the first thing for the intending tenant to inquire about before he takes a house is,—What architect, known to the profession, is responsible for the building?

If the householder be once made fully aware of what is the real significance of building without an architect, a signal blow, and great discouragement would be given to the class of jerry builders. We are not here touching the æsthetic part of the question. There it may be said the game flies too high. It might seem invidious to point out the glaring evidence that exists, in some very high places, of an unfortunate economy in the way of professional counsel. The thing for the public to get hold of is, that they will no more obtain thoroughly good houses,—to say nothing of handsome or picturesque houses,—unless by the intervention of a thoroughly good architect, than they will get through a dangerous illness without a good medical man, or a troublesome law-suit without a good lawyer.

It may even be inquired whether it would not be a boon to the householder at large for the architectural profession to include in its organisation a method of registration. We are not blind to certain inconveniences that might attend the introduction of such a method, but they would gradually tend to disappear. And the result, some little time hence, would be that "Built under the supervision of Mr. Flayscamp" would be an addition to the advertisement of a house to let or sell that would add more than the five per cent. to its real value. Houses would, by degrees, become classed not only according to size and locality, but also according to the warrant of thoroughness of construction that would be given by the signature of certain names. When the public once become aware of the evils attendant on quack building, more will have been done to ensure thorough excellence in our houses than will be effected by any number of miles of letterpress of which the theme is the incompetence of the English architect.

A NEW BOOK ON ARCHITECTURAL THEORY.

We return to the consideration of some of the more special points in regard to architectural art, which we deferred in speaking lately of Mr. Eidlitz's treatise.*

In the chapter headed "Monuments," which is not altogether so practical or so concentrated as it might have been, we come on an idea which is well worth more consideration than it has received, namely, as to the essentially new problem presented by the multiple character of many buildings required for the necessities of modern life. The author makes what to some will be the startling suggestion that architecture "for all the goodly age of this globe, is still in its infancy. We have seen in a former chapter that it deals with single cells, groups, and piles. In truth, the art has not yet risen above the single cell. In Mediæval architecture we certainly find groups of cells and exceptionally rambling piles, but the former are not yet fully developed, and the latter are mere accident, not premeditated, hence not art-work in that sense." This seems at variance with the illustration we quoted in our previous article, of the cathedral with its various divisions of baptistery, chapter-house, &c, as exemplifying architecture which is expressive of certain ideas; and the author is not quite consistent here. From another passage we conclude that in classing even the Mediæval cathedral under "single-cell" buildings he has been regarding it rather externally than internally, but even so it can hardly be classed, in this sense, with the Greek and Roman temple, except with a considerable modification of the definition. But we can pardon him this lapse of consistency, if his remark will but draw more attention to this essential distinction of modern architecture, multiplicity. As he says in another chapter, "The Greek temple is the expression of a single idea, and a single act illustrating it. Most modern structures are the result of a series of related acts, or, perhaps, of a series of ideas of various values, which must be exhibited in order to tell the story of the monument; and hence such a structure cannot be clothed in the simple drapery of antiquity." Considering the matter in this light, the composition of architectural groups is, as the author says, a problem reserved for the future. "This opens to us a vista of activity, which, when fairly reached, will generate works compared with which the cathedrals of the Middle Ages and Greek and Roman temples are the alphabet of art." This is a bold prophecy, and its realisation presupposes a period of architectural ability and genius which we do not see much sign of at present; but that this is a problem hardly solved, hardly even attempted, by most of the architecture of the present day, is unquestionably true, and we only wish the consideration of it could be kept more before the thoughts of architects and those who are interested in architecture. It at least offers us a field for the development of original architectural creation, such as seems almost inexhaustible, as the problem must continually vary and become more complicated with the progress of civilisation. How many town-halls are there among our modern structures (to take one class of building only) which make any attempt to exhibit a grouping derived from the actual arrangements and requirements of the plan?†

In the first part of the chapter on "Form and Construction" the author continues, to some extent, the consideration of the external expression to be given to the internal grouping of buildings, concerning which we will only say that his critical views are what we quite assent to. This portion of architectural designing may be considered as the modelling of the building as a whole, and of its groups; and in connexion with this we may glance at what is said elsewhere as to the modelling of parts. Here (pp. 366-7) the author suggests the true method of learning from Mediæval architecture and applying its principles without copying its details. "Architecture is the art of the development of structural forms." Having developed the main structural form of the whole, we have to express the function of organic structural parts. "If we know that more perfect structural expression may be attained by modelling each part than by facing it with a scenic representation of matured architectural form, then the architect *must* so model each part, and he cannot return to Roman practice, which fails to deal directly with the masses. The architect may reject Gothic forms, and necessarily must do so if the expression of the idea he attempts to materialise results in other forms, as it necessarily will, because the idea is modern and not Mediæval; but he cannot reject this Mediæval method of modelling structural masses." This is undoubtedly the true way to read Mediæval architecture as a suggestion for modern architecture. To make suggestions as to the manner of modelling parts of the structure so as to express their several functions would, of course, be futile, nor does the author attempt it. We come at that point upon the region in which individual thought and perception can exercise themselves in the development of modelling, and it is a question of innate perception, assisted no doubt by mental training, but innate to begin with. The man who does not possess such innate perception can acquire it by no course of teaching, and should not try to be an architect.

A long chapter is devoted to the subject of style, but the author's conclusions might have been expressed and justified (from his own point of view) in much briefer space. They amount to this, that the study of the styles of the past, or the method of regarding architecture as a subject made up of so many styles, is a fatal delusion which tends to destroy any following out of architecture in its true path,—in the only path in which it can become a living and developing art. This is much what Mr. Fergusson has already said; and we may observe that Mr. Eidlitz by no means seems to be aware how many of his own views have been anticipated by other writers on architecture; or, if he is aware, he is somewhat disingenuous in not acknowledging their previous teaching in the same direction; and it is certainly not fair to cite St. Peter's, as the author does, as being the central object of admiration of the architects of the Renaissance school, nor as "the greatest outcome of the Renaissance movement," unless "greatest" refers merely to measurement in feet or yards. No one, as far as we know,—no one who has any understanding of architecture, that is,—regards St. Peter's as the central or most important outcome of Renaissance architecture. On the contrary, it may be doubted if there is any important building about which there is such a general *consensus* of condemnation or dissatisfaction among architects and architectural writers of this generation; and no one has more strongly condemned it in detail than Mr. Fergusson in his "History of Modern Architecture," and on exactly the same grounds as those stated by the author we are now discussing.

Seeing so much space included under the heading of "Style," we looked to find some attempt to define wherein the property called "style" consists, but this part of the subject the author ignores. He does not seem to recognise that the expression "style," besides being applicable to one or another of the forms in which architecture has been practised in the past, has also a more abstract meaning as defining a quality, which is present in all art that is worth anything. The author exhorts the architect to "get rid of every vestige of that baneful thing he calls *style*," that is to say, to escape from regarding architecture as a series of styles, and to regard it as an art to be carried out on its own independent practical and æsthetic basis; and in that we entirely agree. But he ignores the other and very important meaning of the word "style," the quality which is so difficult to define, and which it is the last attainment of æsthetic culture to rightly perceive, but which may be said to consist, in architecture, in the coherent treatment of all the details in reference to one predominating constructive motive. Mr. Eidlitz may reply (and such a reply would not be without reason) that architecture carried out on the principles which he advocates would necessarily have "style" in this sense, but it would have been better, in that case, if he had been more precise in stating his case, and had discriminated between the two meanings of the word "style," the concrete and the abstract: because it is certainly hardly reasonable to urge architects to avoid the baneful influence of "style," when, in fact, style is the very quality

* See p. 593, *ante*.

† We recollect, *apropos* of this, that at the time of the exhibition of the Law Court designs, a letter appeared in one of the daily papers, asking whether it was not a falsity to provide for the concentration of the courts in one immense building, giving the idea of unity of structure; whether they should not have appeared rather as a combination of a number of court buildings of separate design placed in intercommunication.

that so much of our modern architecture wants, and which no truly-developed architecture can well be without. If he had said, "The baneful influence of styles," it would have made all the difference. The architect should avoid imitating *styles*, but should aim at realising *style*. The question "What style is it in?" is one that the architect may disregard; but "Is there any style in it?" is quite another question in regard to a design, and one of vital importance.

In the chapter on "Proportion" the author has run his pen into one or two fallacies, and made one or two hits. Proportion, he says, is generally taken to mean this: "Given a temple of a certain length, what is to be its breadth and height, and what the respective dimensions of its columns, bases, capitals, and entablatures, &c., in order to respond to the laws of beauty?" This the author stigmatises as the popular way of putting the matter, which leads to this mischief, that the laws of beauty (if such laws exist), which are only relative, are by this reasoning raised to positive laws, derived from isolated examples. "Whenever it is asserted by a leading architect that the monument excels in the quality which is designated as beauty, it is assumed that all elements of beauty must be attributes of that monument. Proportion being one of those elements, the monument is said to be a model of proportion, and its proportions are recommended for use in other monuments erected in the same style." These proportions, as Mr. Eidlitz says, are determined by "taste," that vague guide, which has decided that Greek and Roman proportions are beautiful, and has measured them and laid them down as patterns for our modern cutters-out to model the architectural garment upon. This is the philosophy of the idea of universal ratios of proportion in architecture, which so many people have wished to impose upon us as the safest guide. Whether these ratios were really considered of such paramount importance by the Greeks as Vitruvius would have had us believe, is one thing, upon which there may be much room for discussion of a not very profitable character; at all events, they are of no use as guides to the architect of to-day, unless he wishes to sink to a mere servile imitator of "the orders," and we have all of us pretty well got past that now. There is another consideration in regard to "proportion," however, which is very important indeed, and is often quite overlooked in designing, viz: the influence of scale on proportion of parts, and on this point Mr. Eidlitz draws attention to what he regards as an inherent fallacy attendant upon the application of Greek "order" proportions to any scale indiscriminately. He observes that if a design which is considered to be in fit proportion of parts, in regard to the strength of the supports and the weight of the superstructure, be simply doubled in scale, the increase of the mass of the superstructure takes place in a greater ratio than the increase in the area of the piers or supporting masses, consequently that an increase in the scale of the whole, without in any way altering the ratio of the parts, must lead to a disturbance of the due constructive proportion. This is a very important point in determining the proportion of parts in a structure, and it certainly appears to us that it is fatal to the Vitruvian theory of the proportion of the Orders; we say, advisedly, the Vitruvian theory, because we consider it very doubtful whether the theory of Vitruvius was that of the Greeks, or whether he really understood or represented the method and principles of the Greek architects. But we doubt whether there is much truth in the application that Mr. Eidlitz makes of this to the question of the relation between a small-scale drawing and the actual proportions of the building when executed. He suggests that failures in architectural proportion may and often do arise from the architect arranging his proportions in relation to the small-scale drawing of the design on paper, and finding these proportions unsatisfactory in the actual building. This may be, and often is, we suspect, a cause of failure and disappointment, but we believe it is generally in the reverse direction. The tendency in making a small-scale drawing almost always is to exaggerate the thickness of the smaller masses, such as shafts and mullions in Gothic design, and cornices and surbase mouldings in Classic design; and there are probably few small-scale drawings in which such features are not shown more thick and massive than is found to be desirable when the details come to be worked out full-size. It must also be observed that features which appear agreeable in proportion on a large scale would appear weak and fragile when used in the same proportions on a smaller scale. This is seen when, for instance, the Classic column is used or misused as a baluster, as has been sometimes done, when it always appears fragile and weak. This is probably due to an intuitive perception that, while we have so greatly reduced the mass of matter employed, the cohesive power of the material remains absolutely the same, and is, therefore, felt to be insufficient for so small a thickness of material. Nevertheless, the remarks on the subject are very suggestive, and are true at least in one sense, in regard to the proper structural relation of masses.

The chapter on ornament and colour decoration is an exceedingly good one, and we recommend its careful perusal. The author understands very well the function of ornament in assisting the expression of a building; and he combines with his remarks on this some rather novel observations as to the effect of different ways of finishing the surface of a building material. He observes that "a rough quarry face, as well as a polished surface of many sorts of stone, reveals a vigorous crystallisation, and heightens the colour, and thus indirectly the apparent capability of the material to do mechanical work. The experiment may be tried with various cubes of one and the same stone, and of equal dimensions, which may be made to range from a rough quarry face to a finely-tooled surface, and it will be found that the rougher the surface the greater the seeming rigidity of the material." The reason he assigns for this is that the rough stone betrays the nature of its crystallisation, of which we know, from practical experience, that it serves to resist great pressure; while in stone that has been rubbed to a smooth surface, the natural grain is obliterated, and an artificial grain substituted, which resembles the grain of other matter (not stone) which we know to resist pressure but indifferently, unless the stone is further polished, and in this way again made to betray its crystallisation. That this is practically felt in many cases is obvious from the frequent use of rough stone in the basement of a building and tooled stone above; and the device known as "Rustication" is a logical deduction from this, and a carrying out of the same effect artificially on a larger scale. In referring to the effect of colour on apparent structural stability, the author lays down the rule that "the deeper the colour of a structural part, the greater its apparent resistance to strain," and this we believe to be quite true. A heavily-decorated vault in deep colour, resting on white marble columns, would always appear insufficiently supported.

Mr. Eidlitz does not illustrate his remarks by any drawings or diagrams, without which some of his observations will not, perhaps, be readily intelligible except to professional architects. To which class his book is intended to be directly addressed, to the professional or the lay readers, is not very apparent. To those of the profession who have got into practice it is not of much use to appeal for any reconsideration of the theory of their profession; they have got into their groove, and cannot, in the practical sense, afford to make a new departure, even if they attached any weight to another man's judgment, which architects are not more ready to do than other professional men. Young architects who have not yet commenced their profession, or got their ideas about it crystallised beyond the possibility of readjustment, would do well to read Mr. Eidlitz's book, and give consideration to some of the suggestions contained therein; and if the book gets into circulation among general readers, it ought to produce a beneficial effect in giving some more correct ideas as to what architecture really means than most people at present possess. We certainly desire to see a book of this kind gain the ear of the public. Some very foolish and empirical architectural books have obtained circulation of late years, and have been recommended by the "critics" of the daily papers in all the innocence of ignorance; we hope that a book, which, at all events, contains more good sense and logical thought than the average of architectural writings, may obtain some attention also from a public much needing to be enlightened on the subject of which it treats. The best theories of architecture, however, are of little account, and can hardly ever be exemplified as the best, till they find their way into practical demonstration. We do not mean to imply that the author forgets this; on the contrary, if we understand him rightly, it is the keynote of his treatise that architectural style is among the problems of which it may emphatically be said, *solvuntur ambulando*.

THE PROBABILITY OF DEARER COAL.

The importance to all the great trades of a cheap and full supply of fuel, as well as its importance to every household, make the question of the possibility of a considerable advance in the price of coal one of great moment. It is worth while, then, ascertaining whether the prospects of the coal trade tend in that direction. After the sudden bound upwards in the price of coal eight years ago, there was a slow but as complete a fall, and the price of coal has been for some years so low that it has left little profit to the coal-owner. Indeed, in the past year, the collieries of one of the largest coal-owning companies in the north-west of England, —the West Cumberland Iron and Coal Company,—have been worked at a loss, which has lessened the profits in the iron and steel branches of the company's undertakings. But there are indications that this state of affairs in the coal trade is likely very soon to pass away. One of the reasons for this is that the price of raising coal has been of late permanently raised as the result of legislative action. Another reason is more immediately connected with the output of coal. It is usually the case that when there is an increased demand for coal, it is shown first by an enlargement of the output, and then by an increase in the price. For the past five years, —down to last year,—the output of coal has been, on the whole, stationary, whilst the price tended downwards. But the demand that burst out nearly two years ago for iron and steel for the United States caused a very great advance in the demand for coal, and the production for the past year showed one of the most surprising increases that have ever been known in the history of the coal trade. But there are grounds for the belief that when the official returns are procurable for the year 1881 they will prove that that increase in the production has continued throughout the year. Some of the figures that are already tabulated show that the increase has been continued in some of the chief modes of disposal of the coal output. More has been sent to the metropolis; more has been exported to other countries; and though figures are not to hand to show it, it is tolerably clear that more will have been used in manufactures. Other sources of consumption, — such as for railway uses and for the gas manufacture,—show enlarged use, and hence there is tolerably safe ground for the opinion that in the course of a few months we shall learn authoritatively that the coal output of the kingdom has continued to increase even from the high figures attained in the latest year yet returned by the tardy official figures.

As the coal output is increased in this way, the cost of production of coal is on the average raised. This is because when the price is very low, the pits and seams of coal that are cheapest to work are those that are kept in operation; and as additional ones are needed to be put to work, it is those where the cost is rather higher that are started. Moreover, the demand draws nearer the extent of the supply that is available. Some of the producers find the whole of their production taken up, and the tendency of the market is to "stiffen" under these circumstances. This process is now in progress, and there is at the present time a distinct addition to the general prices of coal that had prevailed up to, say, five or six months ago. There are no signs of abatement of the increase in the demand for coal for mining and metallurgical purposes, and the normal increase in the consumption for marine steam purposes, for the gas manufacture, &c., shows no sign of checking. Hence it may be assumed that there will be a growth of the demand, and from the causes just glanced at a slight addition to the prices. But the wages of the workmen are now a very important factor in prices, and as these are now regulated by the price of coal in very large degree, it may be expected that the wages will tend in a slight degree upwards, and thus a stimulus to a further movement will be given for the future; and it would be impossible to define, with any attempt at probability, the extent of that influence. There is, and must be, an increase in the consumption of coal, and though the economies that have been effected in the consumption lessen the rate of that increase, and may in the future still lessen it, yet its

effect is only to retard and not to stop the onward movement. Unquestionably, it will be felt more in some of the coal-yielding districts than in others,—probably that effect being defined in great degree by the nature of the coal that is chiefly raised.

One of our great metallurgical and mining authorities, Dr. Siemens, years ago stated that we had entered upon an era of comparatively cheap coal, and he indicated at length his reasons for that belief. The event has proved that the assertion was one soundly based. But some of these reasons do not now hold good, and we have seen that there are grounds for believing that an increased consumption of coal is probable. If the increased consumption were put to its fullest use, it would be a subject for national congratulation; but this is not the case. There is an enormous waste of coal, and of the power that it represents. Especially is it the case in the household consumption and in that for the purpose of raising steam-power. And in view of the increase in the price of coal that seems to be now probable, and of what may be considered perhaps as the increasing scarcity that may be said to be possible, it is a subject that will need to be brought forward and keenly canvassed, whether there cannot be a check put to the increase in the use of coal by the better consumption and diminished waste of the quantity that we do use. We have seen what has been done, and is being done, in this direction by the ironmasters and by others interested in allied industries; it has been clearly demonstrated how large a proportion of the coal used could be saved if there were proper boilers and engines; and it is to be hoped that the subject will obtain the needful attention before high prices render it an imperative necessity. We have not only a waste of power by the imperfect combustion, but we are thereby converting part of a blessing and a source of strength into a curse and a weakness; and it is to be hoped that the question as to the cheapest fuel,—gas, coke, or coal,—and that of how to extract the largest amount of power therefrom, may speedily impress the national conscience.

THE EARLY YEARS OF MARIETTE-PACHA.

An interesting contribution towards a complete biography of the distinguished Egyptologist, Auguste Mariette, has been recently published at Boulogne-sur-Mer, his native town, by M. Ernest Desoille, under the title of "Les Débuts de Mariette-Pacha," from which we may glean some particulars of the early life of an indefatigable worker and an upright and honourable man.

Edmond About, in his book "Le Fellah," written in 1869, has painted a vivid and lifelike portrait of Mariette, whom he met at the inauguration of the Suez Canal, and the concluding paragraph of his description is remarkable, inasmuch as it is already proposed to raise a statue to him in his native town.

"He is," says About, "one of the most finished men in the world; learned as a Benedictine monk; brave as a Zouave; patient as a copper-plate engraver; natural and kind as a child, although he flies in a rage at everything; unfortunate as few are, and gay as nobody is now; burned as if at a slow fire by tropical heat, and wounded most cruelly by those most dear to him; wretchedly paid; almost poor in a position in which much is expected of him, regarded with suspicion by those in power, and by the people, who do not understand him, and who look upon science as a European superfluity; warmly attached in spite of everything to that mysterious country which he has probed now for nearly twenty years to extract all its secrets; upright and sensitive to an extent that appears to be ridiculous; an obstinate curator of the museum he has formed, and which but few visit; publisher of ruinous books which posterity will perhaps buy for their weight in gold, but which now solicit in vain the encouragement of Government, he is an honour to France, to Egypt, to humanity, and when he has died of despair he will perhaps have a statue."

Mariette was descended from a respectable family, the members of which had distinguished themselves in jurisprudence, in art, and also to a small extent in literature. His great-grandfather was a barrister, and is mentioned in the "History of the French Protestants" as having been one of the four jurisconsults who protested against the execution of Calas. His grandfather was an officer in the Royal navy, and a letter is extant addressed to him in England (where he was imprisoned during the Seven Years' War), written by direction of the Duke de Richelieu, informing him of a proposed exchange of prisoners, from which it has been inferred that the duke attached some importance to his services. Mariette's father was born in Paris in 1793; but family affairs led to his removal to Boulogne-sur-Mer, where he was appointed head-clerk to the Mayoralty, and here, in the Rue de la Balance, his second son, François Auguste Ferdinand Mariette, was born on February 11th, 1821.

Young Mariette is described by his contemporaries as having been a fair-complexioned lad, slight in figure, with an animated countenance, and as being full of fun and frolic. He was at first sent to a private school, but on the opening of the Communal school he entered it among the elder boys in the third form. He does not appear to have distinguished himself at school, except in drawing,—an accomplishment which in after years was of great service to him. In his youth he chiefly employed his talents in this direction in the production of caricatures and sketches of animals. On the walls of the old Communal school at Boulogne are some admirable geographical maps, drawn by Mariette, which show his skill and boldness of handling.

In 1837 Mariette obtained a first-class prize in geometry, a prize in physics and chemistry, and in literature a prize for Greek version and an *accessit* in Latin, English, and history. At the conclusion of his school studies he assisted his father at the Mayoralty from 1837 to 1839. In the course of this latter year he obtained the appointment of French master and teacher of drawing in a school kept by a Mr. Parker, at Stratford, where he remained until 1840, when he removed to Coventry, and endeavoured to obtain a living by designing for ribbon manufacturers, but finding that this branch of industry was miserably paid, he returned to his native country, with the intention of resuming his classic studies.

At the end of six months he was ready for his examination, which he passed at the March session, 1841, at Douai. He took his degree as Bachelor of Arts, with honourable mention, and resolved to devote himself to teaching. A short time afterwards we find him at the Communal school in his native town, first as a monitor and then as French master (with a salary of 56*l.* a year), and finally as *régent dans la classe de septième*, or assistant master (1841-43).

About this time Mariette's literary talents began to develop themselves, and he commenced by contributing occasional essays, mostly of a topographical character, to the local newspapers. These early efforts, of most of which a record has been kept by his biographer, are described as showing great originality of treatment, and giving signs of promise which were afterwards fulfilled, not, however in the manner which was anticipated.

An event which occurred in 1841 decided Mariette's future vocation. This event was the death of Nestor Lhote, the companion of Champollion, which occurred in that year, and Mariette, who was cousin of the deceased, was entrusted with the duty of putting his papers in order. The examination of these manuscripts by him fixed at once the bent of his inclination, and he became from that time an enthusiastic student of Egyptian antiquity. He was assiduous in his attendance at the Museum of Boulogne, which contains a respectable collection of Egyptian antiquities, part of the spoils of Napoleon's celebrated campaign, and diligently sought to penetrate the secret of the hieroglyphics without any other master than his own untiring patience, and sustained by an enthusiasm which rose to the height of the heroic.

Among the works projected by Mariette was a history of the Boulogne pirates, towards which he had collected a considerable amount of materials, but its completion appears to have been prevented by a taunting allusion in an opposition journal to the precautions he had taken, in the portions already published, to avoid wounding the susceptibilities of the English nation. This reproach, if deserved, will not tend to lessen our admiration for the character of M. Mariette, who at a time when the relations between France and England were somewhat strained, appears to have risen above petty international jealousies.

In 1843 Mariette became editor of *l'Annotateur*, a Boulogne paper. He did not, however, relinquish his position at the Communal school, and in addition he gave private lessons. In June, 1845, he married the sister of one of his pupils, Mdlle. Eléonore Million. Notwithstanding his numerous occupations, he found time to interest himself in local affairs, and was an active member of the local committee for primary education, secretary of the Agricultural Societies, a member of the Friends of Art, &c.

In 1846 he resigned the editorship of *l'Annotateur*, alleging that he found it impossible, from his numerous engagements, to devote that attention to the newspaper which he considered due. He employed the time thus gained in writing a letter to M. Bouillet on his article upon Boulogne in his "Dictionnaire Universel d'Histoire et de Geographie"; a second letter upon the incursions of the Normans; and some contributions towards a history of Wissant. In March, 1847, he published a "Catalogue of the Egyptian Antiquities of the Museum of Boulogne," a small octavo pamphlet of nineteen pages, the first-fruits of his studies in Egyptology.

In 1849, Mariette attracted the notice of M. Ch. Lenormant, the curator of antiquities of the National Library, and professor of archæology at the College of France, by means of a pamphlet on the inscription on the left side of the Hall of the Ancestors of Thothmes III., which Mariette sent him in manuscript. Mariette went to Paris and obtained an appointment as assistant in compiling the catalogue of Egyptian antiquities at the Louvre, at a salary of 2,400 francs (96*l.*).

While engaged on the catalogue of the Louvre he still pursued his studies and wrote a memoir (not published) on Coptic bibliography, and a note upon a fragment of the royal papyrus of Turin, published in the *Revue Archéologique* in 1849.

The memoir on Coptic bibliography obtained for him a scientific mission from the French Government, by which he was directed "to explore all the convents of Egypt, and principally those of the Thébaïde, which contain libraries of Coptic, Syriac, Arabic, and Ethiopian manuscripts, with the object of forming a collection of Oriental manuscripts relating to the history and antiquity of Christian Egypt."

To conclude, in the words of Mariette's friend and biographer of his early years, "The 4th of September, 1850, arrived, and he started. It was soon seen that, from his stature, his strength, and moral force, he was the man to accomplish his difficult mission. His mission, did I say? He went beyond it; for, sent to collect manuscripts already carried off by an unscrupulous Englishman, he discovered temples,—the Serapeum and the ruins of ancient Memphis. Then he will assist to reconstruct in fancy the cities of Heliopolis, Abydos, Thebes, Sakarah, Karnak, Denderah, Gebel, Barkal,—tombs of a buried civilisation. Then he will found the French School of Egyptology, the Egyptian Institute, the Museum of Boulak, where, after his death on the 18th of January, 1881, his body will be transported in a magnificent casket, a sarcophagus of the thirteenth dynasty, selected by himself for that purpose, to remain for ever in the midst of those archæological treasures he had exhumed from the sands of the valley of the Nile, and to attest the French origin of the museum which he had created." J. H.

REMARKS ON THE POSTURE OF STATUES.

That is after all but a hybrid statue which has its origin partly in delineation from a portrait taken from life, and partly from the imagination of the artificer. Thus any full-length representation of Shakspeare is partly realistic, partly fanciful, because there is no record of the poet's whole figure extant; all of his likeness that has been handed down to us is his bust, and when an artist takes upon him to put a body and legs to this bust, the nether part of the figure he concocts is entirely fanciful, and no more authentic than a mermaid's tail.

No stereotyped attitude should be introduced into the statue of a special individual. The attitude should be peculiar to, and characteristic of, the individual portrayed. It is requisite that the artist, as well as the historian, should curiously observe wherein one man differs from his fellow men as well in small as in principal points; but the large leading characteristics ought to be attended to in the first place. The artist who gives us a fair representation of these may be pardoned should he neglect some trifling detail; but he who bestows all his attention on small details to the neglect of leading characteristics offends seriously. It is possible to make too much of Cromwell's mole.

Oliver Wendell Holmes has a sentence in one of his books which is pertinent. Looking back to the period of his childhood, he says he could recall the image of many posturing friends. The sculptor should strive to catch glimpses of

his subjects, as Professor Holmes recalled the image of his departed relatives,—as posturing friends,—every one with his own individual and special postures. It is not every one who has the eye to catch up at once and in whole what may be termed the trigonometry of the individual human form. Not every one is a Tobias Smollett,—able to take note of the attire, the projection, the rake of each figure he observes, at a glance. Yet without some such ability, natural or acquired, how is the artist to produce correct portraits, whether on canvas or in marble? As Sallust, in his writings, has portrayed his characters in the height of their passions, unreduced, unaneled,—with all the prejudices, propensities, proclivities,—encrusted thick upon them, and has disclosed to view all the idiosyncrasies of their inner man,—so should the sculptor, when producing a statue, strive to present us with a verisimilitude of the outer man for our contemplation. In waxworks, the posture of the figures is often studied and stiff, and this detracts from the interest of the statues, for as they are generally appropriately, picturesquely, and splendidly dressed, one finds that the greater number of the spectators are taken up with observing the minutiæ of their clothing, and are indifferent to the bearing and contour of the figures. Yet when they meet with the likeness in *facsimile* of some object whom they know, how warm is the expression of their approbation,—perhaps the model of a blind beggar of the town pulled along by his faithful dog attracts their eye,—this group delights them, because they recognise in it the very counterpart and image of that man and that dog which are familiar to them.

A statue is the counterpart of the quick body, and should be life-like; but too often the sculptor makes it stiff, stony, and like a figure from which life had departed. It is by the deed implied in the posture of the statue that the life-like impression can best be conveyed to the mind. The man should, so to speak, be arrested in the very act and turned to bronze or porphyry. Those statues will always be most attractive which present their subject not in repose, not resting from work, not sitting in a studied attitude as if expecting that their portrait is about to be taken, but in the heat of labour, and engaged in some customary or representative movement,—the general leading on his troops to battle; the poet beating the heaven-born flame; the mechanic employed with his tools; the musician playing on his instrument; the physician bending over his patient; the preacher exhorting his people; the king holding out the sceptre of mercy to the prisoner.

The directions given to Flaxman for his statue of William Pitt, designed for the Glasgow Council-chamber, were that the great statesman was to be represented exactly as he stood on the floor of the House of Commons when addressing the House. How well Flaxman carried out his instructions can yet be seen.

We find, frequently, attempts made to depict the figures of men performing deeds in which the men themselves are not usually nor likely to be often engaged, and in which it cannot readily be known whether the model is rightly posed or not, and, therefore, in which it is difficult to decide whether the form of the figure which has been attained to is twisted or even. In many statues it seems to us that the human form is contorted quite unnecessarily and unhappily. It is a great matter to have every limb set in its natural position, but it is not the easiest thing in the world in every case to arrive at this destination. In the awkward and forced position of the limbs in some rustic statues, we have one of Lord Chesterfield's observations paraphrased in stone,—"His figure (without being deformed) seems made to disgrace or ridicule the common structure of the human body; his legs and arms are never in the position which, according to the situation of his body, they ought to be in, but constantly employed in committing acts of hostility upon the graces." It is almost incredible after what egregious designs some statues have been modelled; for example, we have it on good authority, that in the case of the stone figure of Tam o'Shanter, kept at Burns's monument, Ayr (in conjunction with that of his equally famous drouthie cronie "Souter Johnnie"), a small attenuated grasshopper of a man sat for the body, in place of a big carter with herculean limbs who sat for the legs.

Every limb should not only be perfect in itself, but it should be in harmony with all the other limbs and parts of the body, and the junction of the limbs with the trunk must be cleanly made, and the flow of the contour ought not to be interrupted by it. The pose is everything in a statue; but how much does not this imply? Not only does it cover an appropriate attitude, but it demands also that no feature or limb should be absent from or indifferent to the sentiment which dominates in it. All parts must tend to enhance the value of the main intent of the figure. The eye must not be distracted and drawn from one point to another, and deluded in the attempt to construe the meaning of the piece. No large or prominent feature should be exaggerated, nor any insignificant feature reduced, but each must be written out to its own proper size and comparative dimension.

Nothing can be more despicable than to trick out and overdeck what is plain and mean in itself. What the sculptor has to do is to look for such graces as his object has, and display them, and not to bestow graces upon it which it has not. There may be small dimples, and nodules, and flutings, which connect and unite in one the prominent parts of the face, the development of which may give a fine flavour to the countenance and form the point of its whole illustration. A club-nose can never be a beauty in itself, yet it may have a certain comeliness when blended with corresponding, complementary features, well expressed; and it is the business of the artist to discover and disclose such a harmony as this will be, wherever it exists. It is evident that, owing to the usages of the ancients, their necks were more powerful in marking expression than is the case among civilised people now-a-days; but now in modern days, just as in ancient times, upon the neck depends the distinct and distinguishing carriage of the head. And if the character of the figure can be heightened by bestowing attention on the bearing and contour of the neck, assuredly it ought not to be neglected. The artist must search diligently for the hidden treasures of the whole bust, and bring them to sight. He must turn the light of his lanthorn upon it; pass it carefully over it, and discover where beauty lurks. There may be a lovely shell in the convolutions of an ear; there may be a pretty circular bias in the wave of a nostril, which is well worth being carefully noted and copied out. As a little tick placed at the beginning and the end of a sentence decides the question of its orginality, so may the turning up or the drawing down of the ends of an eyebrow or the wicks of a mouth make all the difference between the bestowal of the air of reality by which a likeness is at once recognisable, or the withholding of it.

Sculptors have each and all their own opinion with regard to the draping of statues, and it is hazardous to speak on the matter. Loose, flowing drapery, which is so often preferred and employed, makes some men look as grand as Roman senators, but it makes others look as if they were in a barber's shop prepared to get their hair cut. Every man looks most natural in the clothes he is accustomed to wear, and it is in such that we would have the sculptor model his people. Some costumes are condemned as being wanting for purposes of artistic effect. We do not think that almost any dress of any period in which people conducted their business and wrought their work, could ever altogether conceal the existence of a goodly form underneath it. The grace of feminine beauty and the spring of manly strength will show through any garb that people can freely move in. And as for those who shrink away in their clothes, and seem to strive to hide themselves behind their own shirt-collar,—they will certainly appear most at home in the clothes they have been in the habit of wearing,—and to put them into loose drapery or strange clothes, however fine, would simply be to hide them from view altogether. Let all celebrated persons be transmitted to posterity as they appeared to their contemporaries,—not in fanciful masques in which nobody would recognise them,—and in which they were not in the habit of appearing.

The classical, when reduced to its least common measure, is the appropriate and the becoming. If a monarch dresses himself unbecomingly, and without reference to his social status, it is impossible to picture him in classic shape. His usual attire and make-up are not classical; and to represent him in classical robes, and made up like a classical form, would be to perpetrate a caricature. Carlyle complains that, in all the portraits, except one, his hero Frederick the Great is represented with a common air, and is given the look of a head drill-sergeant rather than that of a *grand monarque*. The truth is that Frederick acted very much the part of a head drill-sergeant, and dressed shabbily beneath his rank, and accordingly was painted correctly just as he stood; besides, what could be expected of the portraits of a king who, as Carlyle himself informs us, was naturally inclined to be dirty, and who also, as Wraxhall tells us further, pulled on his boots in bed?

The artist ought, nevertheless, to seek out and display the best points, even of a sorry figure. As a fine woman knows exactly how much of her charms to expose to view in order to excite admiration, so should the sculptor study the contour of his subject, and make his drapery disclose and bring out all its good points. He must also make the display, as she does or ought to do, in attitudes which are apparently unstudied, and with what is termed unconscious ease.

Let not the young artist forsake the beaten track of his profession in search of too many novelties. If he attempts dispensing with the routine and customs of his profession, to strike out a new path for himself, and pretends to copy no one, but aspires to be entirely original, he is sure to make a splendid muddle of it, and to bring forth an illustrious piece of disorder. He is to conceive, indeed, but it must be naturally and rationally, as other efficient men in the same line have conceived before him,—not monstrously and absurdly as his own heady inclination would lead him to do. To be successful he must betake himself to the highways and not the byways of his art.

In addition to this, he must be watchful to avoid slovenliness on the one hand and stiffness on the other. When labouring to bring up his surface to the roundness and smoothness of a flute he is apt to make his work stiff. On the other hand, if he tries to avoid this, in order that he may appear easy, he is not without temptation to become slovenly. He must try to steer clear of both of these disturbing pitfalls. Of the two blemishes, stiffness is the more likely to be overcome by constant practice. Slovenliness rather grows on one. How often have we not seen that the inferior and less noticeable parts of a statue, instead of being carefully and artistically wrought out, have been knocked off skimble-skamble, — have been settled as much by chance as by design. Wherever there is either imperfect conception or careless execution the work is deteriorated, and the value of the piece is detracted from; this may not be evident when the statue is first uncovered, but it will become only too plainly apparent so soon as it has lost the gloss of newness and has got worn a little.

Slovenliness may be shown in three ways. There is sometimes slovenliness in arranging the model,—this may be passed off as natural ease and truthfulness to life; sometimes in the execution of the work an attempt may be made to pass this off under the style of "working in rough," and sometimes in finish this last may very readily be passed off under the name of "boldness of touch," but any of the three acts of slovenliness will mar the statue.

If there is an art in which perfection is required,—and nothing short of perfection suffices,—that art is sculpture. When a statue is finished it should look as if it had never been touched by human hand, but had sprung into existence complete as it stands. It is not often that one comes into the neighbourhood of a work of art, and when he does it is generally a piece of sculpture, which, in a moment, at the first glimpse, evokes a burst of pure and perfect joyfulness in the heart. Once or twice, however, have we been surprised by coming unawares into the presence and beneath the halo of a sparkling animated form, in white marble, all dripping with grace and light, the dazzling beauty of whose posture shot ethereal fire out of the eyes, and made us happy even in the thought that any such delightsome handiwork of man existed on the earth, fast and safe, and was not a mere dream and illusory. Moreover, we would not class as a work of high art any statue or any piece of sculpture which has no quickening power, which never moves the soul at all, which finds us calm and leaves us calm.

Florence.—The ex-Grand Duke of Tuscany has undertaken, at his sole cost, the restoration of the front of St. Mary of the Flowers at Florence.

SO-CALLED ACOUSTIC POTTERY.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute on Monday evening last, Professor T. Hayter Lewis, vice-president, in the chair, Mr. Farrer was introduced to the chairman on his attendance for the first time since his election as Honorary Associate, and it was announced by the honorary secretary, Mr. Maclvicar Anderson, that Mr. Farrer had kindly undertaken the office of Honorary Solicitor to the Institute, in place of the late Mr Frederick Ouvry, F.S.A., his partner.

Mr. Gordon M. Hills then read a paper on "Earthenware Pots (built into Churches) which have been called 'Acoustic Vases.'" The author said that the assumption that the earthenware vases found built into the walls of several churches, not only in England but in other countries, were used for acoustic purposes was evidently based on a statement made by Vitruvius to the effect, as he (the author) understood it, that there were recesses made under the seats of the theatres, and in each of those recesses was placed a brazen vase with the mouth downwards, but supported at the front edge. Vitruvius remarked that he knew nothing of these vases himself, but that he derived his account of them from an old Greek writer. He also expressly said that there were none of these vases used in the Roman theatres. In the year 1861 the ancient monastery of the Celestins at Metz was pulled down by the French engineers. The author said he apprehended that no earthenware pots were found built into the walls, because the Metz archæologists made no mention of them. But the pulling down of the monastery led to a German archæologist taking up the study of the history of the monastery, and in the course of his investigations he discovered that one of the monks, under the date 1432, had recorded that in that year the Prior Ode le Roy introduced into the church of the monastery an arrangement of acoustic vases, having been greatly struck with the good effect of such a device in another church. A marginal note, attributed to the chronicler, said "Ecce risu digna." The Abbé St. Leger's work (1665), entitled "L'Apocalypse de Meliton," gave this instance of the neglect of their duties by the religious orders,—"Of fifty singing men that the public maintain in such and such a church, there are sometimes not more than six present at a service; the choirs are so fitted with jars in the vaults and in the walls, that six voices there make as much noise as forty elsewhere." A theory tracing such arrangements back to the ancient Chaldeans might be regarded as exploded. As had been shown by the editor of the *Builder* in 1857, the terra-cotta cones discovered by Mr. Loftus were constructive, not acoustic. Examples of acoustic vases belonging to Classic times had been collected by Mr. R. R. Brash. The greater theatre at Hierapytna, in Crete, had at least one row of bronze *echeia* or jars. At Lyttus there were three rows. Like provision seemed to have been made at Saguntum. The ancient theatre at Scythopolis, in Syria, had seven recesses for *echeia*, in the position indicated by Vitruvius, and like arrangements had been found in a theatre at Arizani, in Asia Minor. Coming to Mediæval examples of so-called acoustic vases, Mr. Hills remarked that they had all been found solidly built into walls,—a departure from the Vitruvian doctrine, suggesting a different purpose. Beginning with Continental instances, M. Stassoff, editor of the official archæological journal of St. Petersburg, was cited to prove that acoustic pottery had been found in a great many ancient Byzantine or Græco-Russian churches in his country. For Sweden and Norway, M. Mandelgren, a Swedish architect, claimed a pretty considerable number of churches furnished with earthenware pots built into the walls and vaults, with their orifices turned towards the interior of the building. One example cited by Mandelgren was the Church at Bjerejoë, a small vaulted structure very much resembling Kilpeck Church, Herefordshire. Passing on to France, where the evidence seemed wholly negative as to the survival of any fragment or trace of the pots put up by Ode le Roy in the Church of the Celestins at Metz, Mr. Hills said it was in April, 1842, at the Church of St. Blaize, at Arles, that the first modern French discovery of earthenware pots built into the walls was found. Of this a detailed description was given, after M. Didron, who called the pots found "cornets" of baked earth, and "pots acoustiques." They were shaped like the horns used by French herdsmen. The so-called acoustic pottery had also been found at Aberbrach, in Brittany, St. Martin, Angers, and Clisson. In Switzerland it was commonly said that numerous examples of acoustic pottery in walls were known. A few particulars were cited from Mr. Albert Way, F.S.A., and Dr. Keller, President of the Society of Antiquaries at Geneva. Crossing over from the Continent, Mr. Hills found one Irish and a few English instances, on all of which he dwelt. The Irish discovery was at the fine old collegiate church of St. Mary's, Youghal. The English finds of pottery built into church-walls were next spoken of in order, from the earliest at Fairwell, in Staffordshire, in 1771, to the latest, in 1878, at Leeds Church, near Maidstone. This last Mr. Hills elaborately described from personal examination of the site and all the architectural features and facts. Examples discovered between these dates were the pots found in the churches of St. Nicholas, Ipswich, where the discovery was made in the course of repairs going on about 1848–9; St. Peter Mancroft, Norwich, in 1852 (described and illustrated in the *Builder* for 1863, p. 893, by Mr. Makilwaine Phipson, to whom Mr. Hills expressed his indebtedness for much information); Fountains Abbey, Yorkshire, in 1854; St. Peter Mountergate, Norwich, in 1860; St. Olave, Chichester, in 1851; Upton, near Southwell, Notts, in 1863; Denford, Northamptonshire, in 1864 (illustrated in the *Builder* for 1864, p. 953); St. Clement, Sandwich, Kent, in 1869; East Harling, Norfolk, in 1872. In conclusion, Mr. Hills spoke as to the purpose of the embedded jars, reviewing the evidence for and against the acoustic theory, but inclining to agree on the whole with M. Didron, who deemed such an acoustic device quite childish, if not with the Metz chronicler's derisive judgment, "Ecce risu digna!"

In the discussion which followed,

Mr. Loftus Bröck, F.S.A., said the subject was one of great archæological interest. He thought it to be unquestionable that, rightly or wrongly, the earthenware vessels which had been found built-in in the walls of Mediæval buildings were intended by those who placed them there to serve some acoustical purpose. Most of the articles of pottery that were found did not seem to have been made for the purpose: they were the ordinary culinary vessels of the periods in which they were built in. It was noteworthy that so many specimens of earthenware vessels had been found in the walls of Norfolk and Suffolk churches. Possibly it would be found that the insertion of a few earthenware pots in the west wall of a modern church would effectually stop the echo which was so often found. An early volume of the *Builder* contained an account of the checking of a great echo in St. John's Cathedral, Antigua, by placing a screen of perforated boarding at the west end of the nave. He had in his own experiance found similar expedients to be effectual in attaining the same end, and therefore it was possible that there might be a practical outcome to the interesting archæological paper which had been read.

Mr. Joseph Clarke said that most of the earthenware vessels discovered during the restoration of St. Clement's Church, Sandwich, were filled with mortar.

Mr. Thomas Blashill said that not only vessels of pottery, but the skulls of horses, had been used in buildings with the view of improving the acoustic properties of a building. The skull of the horse was exceedingly cavernous, and therefore appeared to be well adapted to serve the same purpose as that which was intended to be fulfilled by the hollow earthenware vessels. Just thirty years ago he was at a large meeting at an inn in a place called Portway, a few miles west of Hereford. On that occasion the landlord stated that the floor of the room in which they were assembled was laid on horses' skulls, with a view, as he said, to improve the sound of the fiddle, the room being used at times for dancing. A few years ago, when he was in the neighbourhood, the inn was being altered and pulled about, and the workmen having come upon these skulls (which were, he understood, found to be secured in three rows to the under side of the floor by screws), they had decorated the top of each of the scaffold-poles with a skull. Unless he was mistaken, a similar use had been found to have been made of horses' skulls in Lancashire.

Mr. Arthur Cates, in proposing a vote of thanks to Mr. Hills for his interesting paper, said that besides the openings found in the theatres at Saguntum and elsewhere, there was another curious instance which might serve to throw some light upon the principles which guided the Swedish architect who devised the vault of the church at Bjeresjoë with its five rows of vases, one row being along the apex. In one of the early editions of Terence, there was a sort of introductory notice by a commentator, who mentioned the use of vases of brass for the purpose of increasing the sound. He wrote: "In certain temples of antiquity which have come down to our time, there are, at the foot of the vaults and at the upper part, rows of cavities in which brazen vessels were placed, with the mouth turned outwards, which served to increase the distinctness and the melody of the voices of those who sang within the temple."

Mr. Charles Fowler said that Mr. Hills had not mentioned any pre-Roman examples of the use of such vases as were mentioned by Vitruvius for acoustic purposes. One such example occurred to him, however, and that was the theatre at Taormina. When he visited Taormina thirty or forty years ago the acoustic properties of the theatre seemed to be very good, notwithstanding the imperfect state of the building. Some of those present would remember possibly that the late Professor Cockerell intended,—if he did not actually do so,—to apply vases for acoustic purposes, in a concert-room at St. George's Hall, Liverpool, the vases being placed under the seats, which rose one above another as in a Greek theatre.

The Chairman said he thought the vases were placed in the ceiling?

Mr. Fowler said that was the case in the large hall, and the arrangement was due to Mr. Rawlinson, the engineer, but he was referring to a concert-room, of which he remembered seeing Cockerell's working drawings.

Professor Kerr said that in the music of the ancients the scale was different to that which we used. The scale which the ancients used was that furnished by the black notes in our pianofortes, and it produced music in a minor key. It occurred to him that the bells,—for such they really were,—which Vitruvius described, might really have served the purpose for which they were stated to have been used,—that of producing resonance.

Mr. Stannus suggested whether the pots found with perforated bottoms might not have been used for purposes of ventilation.

The Chairman, in closing the discussion, said that a few months ago he was in the ancient theatre at Argos, which was 500 ft. diameter,—the orchestra (the part in which the chorus used to perform) being itself 200 ft. in diameter. He and some friends who were with him tested its acoustic properties, which were found to be remarkably good. In regard to Fountains Abbey, a very good account of the acoustic pottery found there was contained in the reports of Lord de Grey.

Mr. Hills, in acknowledging the vote of thanks accorded to him, said, that whatever might have been the actual result, he believed the Mediæval pots which had been described had really been intended to improve the acoustic properties of the churches in which they were found.

IN AND ABOUT THE TEMPLE.

If Charles Lamb or any other past frequenter and admirer of the Temple could rise from the grave and observe how rapidly its features are changing, he would doubtless regret that its quaint and somewhat sombre characteristics are leaving it. In truth, in few parts of London, considering the space, have the changes recently been greater than in the Temple. At the present time, perhaps, the more noticeable point in connexion with it is the variety of architecture that is to be found there. If variety is charming in architecture, as it is supposed to be in other things, there can be no question that the Temple should excite admiration. For our part, we are somewhat doubtful if so much variety in such close proximity does not spoil the general harmony of character which should be one of the most attractive features of such a place as the Temple. As we all know, there is, first of all, the celebrated church, with its severe and simple Norman and Early English styles; then, close beside it, on the south, is the square and grimy red brick block known as Lamb-buildings; whilst immediately opposite is the new Hall of the Inner Temple, in the Decorated

Gothic style, in grey stone. Joined on to this, and of the same material, is the library of the same Inn, in a more domestic style of Gothic, and still in progress is the new extension to the library, forming a northerly wing and joined to the clock-tower. But here is again a diversity, because this new building is red brick with stone windows and facings, and by no means in the same style as the building of which it is to form a part. But what strikes the observer is that it would have been more productive of architectural harmony if the new addition had been in the same material and more nearly in style an approach to the existing library, and had also been designed so as not to have been overpowered, so to say, by the clock-tower of the library. Opinions may differ, but we give this as a criticism which may be worth consideration, because it is quite clear that building operations in the Temple will not yet cease, and care should be taken to make whatever is erected worthy of so famous a spot. To turn now to another part of the Temple, the late Mr. E. M. Barry's block of buildings known as Temple Gardens, which has its main front to the Embankment, and which is in the style of the Renaissance, florid and elaborate in detail. There can be no question that this is a successful work, regarded from the Embankment; it is a valuable addition to London. But unfortunately it forms an end to the grey pile of Harcourt-buildings, and, seen from the Temple, it dwarfs this block and is quite out of keeping with the rest of the architecture in the Temple. Taken alone, there can be no question about its attractive and handsome character; taken with the rest of the Temple and that part which it joins, there is a distinct sense of incongruity about it. Nor internally is it quite as well planned for the purpose for which it is required as could be desired. The turrets at the corners give spaces which are very odd and almost useless, and many of the rooms are too large for their use. The great desideratum of chambers in the Temple is that they should be moderate in size. When it is remembered that for a fair-sized room on the first floor the rent is about 60*l.* a year, and that large rooms are not of practical utility for a barrister's work, the importance of keeping the rooms of moderate proportions is very great. But the most remarkable thing in the way of building has recently been achieved by the authorities of the Middle Temple. Between the north-western end of the late Mr. Barry's Temple Gardens and the southerly end of a three-storied red brick block known as Plowden-buildings until lately was a small open space. Here, however, has just been erected a small block of buildings in grey stone, in the Perpendicular style, much lower than the so-called Temple Gardens, so that the northerly end wall of the Temple Gardens stands up far above the new block quite naked, so to speak, and dwarfing the new-comer in the most marked way, who looks as if he had dropped from the skies, having no relation to his neighbours either in size or style. The Temple is a spot where the building capabilities are almost unique in London, and it is melancholy to see such want of taste as is exhibited by the erection of the new block. We have criticised Temple Gardens in regard to its want of accord as a single building with the general style of the buildings in the Temple, though we have expressed our admiration of it; but of this new addition no good word can be said. Something, indeed, has been said about certain claims in respect of light to buildings across the roadway, but we cannot think that there would have been any substantial deprivation of light caused by a higher building; nor can we believe that the authorities of the Inner Temple would have so little regard for the beauty of the Temple as to let any narrow feeling of jealousy of the Middle Temple induce them to prevent the erection of a fitting continuation to Mr. Barry's handsome block, even though it might render somewhat less valuable their rooms which front the roadway. Assuming even that their back rooms were somewhat darkened,—though they would not be more gloomy than dozens of other rooms in the Temple,—yet the Temple generally would have gained by the additional stories to the Middle Temple. If any such course, however, has been taken by the Benchers of the Inner Temple, it is another sign that the Inns of Court should be ruled by a representative committee from all ranks of the members, not by a self-elected body of Benchers, who are either too busy to attend properly to their work, or have lost touch of the general feelings of the members generally, and are an age behind the time. Nor have the Middle Temple authorities been happy in Fountain-court. They recently purchased a house or houses fronting on Essex-street, and with the back looking on the well-known fountain of the Temple. In front of this newly-acquired property they have placed a building with a ground-floor only and a flat roof, most common-place in character, thereby losing the opportunity of increasing the general space round the fountain and adding a thing certainly not of beauty, but of ugliness, to the Temple, and exhibiting a want of taste which one might have hoped,—looking to the pecuniary resources of the Temple and the character of the gentlemen who are its guardians,—would have never been allowed, especially as the amount of room gained by this single bit of building is very small.

Connected also with the Temple is another point of practical importance, namely, the necessity of a connexion in the nature of a subway between it and the New Law Courts. The crossing of Fleet-street is a most tedious business at the best of times, and when it will have to be done constantly by lawyers with bags, books, and often with flowing gowns, on wet days, it will be simply an intolerable vexation. It would be perfectly feasible to make a short subway from Middle Temple-lane, and we feel convinced that it is only a question of time. But we would urge that it should be undertaken at once for the purpose of professional and public convenience, and that it should not be postponed till the demand of the lawyers and the public makes it necessary to neglect it no longer. As soon as Fleet-street is widened, as it soon will be, at its commencement, the need will be greater than ever, and the difficulties of the transit increased. Therefore, again we say, let a subway be made at once.

RAILWAY DEVELOPMENT.—NEWHAVEN HARBOUR.

A GREAT WORK IN CONCRETE.

The vast extent to which railways and railway traffic have been developed, within say the last thirty years, would be almost incredible if not attested by official documents of indisputable authority. Mr. James Allport, of the Midland Railway Company, a man of large and accurate railway knowledge and experience, has recently given the public a series of carefully-prepared tables touching the growth of railway traffic. These tables and accompanying letters have appeared in the *Times*. It appears from these that in 1850 the total length of the railways in England and Wales was 4,679 miles; in 1880 it was 12,547 miles. The number of passengers carried at the one period was 58,514,134, and at the other 540,669,175, or nearly tenfold. The receipts from passenger traffic were, in 1850, 5,888,600*l.*; in 1880, the receipts had risen to 20,341,096*l.* The 7,868 miles of additional line, made or opened between 1850 and 1880, involved, of course, many important and costly engineering and structural works in tunnels, cuttings, embankments, viaducts, bridges, station buildings, grand hotels, &c. In the former class are the heavy works on the Settle and Carlisle line of the Midland Company, the direct South-Eastern, *viâ* Tunbridge, and many other new lines that might be named. As regards stations and hotels connected with them the period includes the erection throughout, or the remodelling and enlargement of the Charing-cross, Cannon-street, St. Pancras, Liverpool-street, Holborn Viaduct, Waterloo, London Bridge, Euston, and King's-cross stations. Great works in the same direction have also been executed in joint stations, at Carlisle, Leeds, Liverpool, Manchester, Birmingham, and other provincial towns.

The works referred to have been executed, for the greater part, for the accommodation of traffic within the confines of the United Kingdom, but the boldest projects of some of the companies whose lines radiate from London are undertaken with a view to the creation and fostering of an interchange traffic with places beyond these confines. The companies are not content that their termini should be fenced in by the seaboard, and having conveyed their train-loads of passengers or goods to the English ports by their steam-horse, they provide their fleets of marine locomotives to carry them traffic across the North Sea, the Straits of Dover, and the English Channel, and to bring thence return freights. The important harbour works of the London and North-Western Company at Holyhead, that were for so many years in progress, are not perhaps quite in this category. The main object for which these great works were undertaken was, we believe, to perfect the company's Irish Express Mail, passenger, goods, and cattle service, now one of the most superb known in any part of the world. The Great Western does also a large Irish carrying trade to and from the fine docks at Milford Haven, but there is no Continental traffic worth mention west from Plymouth or north from the Land's End. The Great Western Company make use of Weymouth to do a large carrying trade with the North-western Provinces of France, and the South-Western Company do the same *viâ* Southampton; but the great bulk of the passenger and fast traffic between the south, south-east, and east of England is done by other companies and through other ports, as by the Brighton Company between Littlehampton and Honfleur, but much more extensively between Newhaven and Dieppe. The South-Eastern Company has its ports for departure and arrival at Folkestone and Dover, and is about to have its Port Victoria at the mouth of the Medway. The Chatham Company also uses Dover Harbour, and Queenborough, near the confluence of the Medway with the Thames, on the opposite bank from its new rival, Port Victoria. Turning up the Thames, the enterprising Midland Railway Company, the whilom "Midland Counties," which was extended to London some years ago, has now almost completed its own extensive dock, harbour, and warehouse system, at Blackwall, on a costly property bought from Messrs. Money Wigram & Co., and it is not at all improbable that the company that commenced by doing a little railway traffic between Derby, Leicester, and places at a moderate distance from them, may have ere long its fleet of powerful steamers for Continental traffic. The Great Eastern Company, as is well known, does a very large Continental carrying trade *viâ* Harwich.

Obviously the necessity of waiting for the tide must be a great annoyance to passengers, and detrimental to Continental traffic by a line of communication that is handicapped with such necessity. The South-Eastern Company, by the construction of the new pier, of which the Prince of Wales laid the foundation-stone at Folkestone the other day, intends to get quit of this disadvantage; and the Brighton Company is executing the bold and costly project they have in hand at Newhaven, in order that they may be able to take out of port, or bring in, their steam vessels, whether freighted with passengers, "perishable cargo," or both, at any time or state of the tide.

Newhaven is situated at the mouth of the Sussex river Ouse. It has not always had this name, and the river has not always disembogued at that place. In a time long past a violent storm altered the course of the river, which forced out for itself a new channel at the place where it has ever since flowed into the sea. The old channel, some three miles to the east, at or close to Seaford, got completely filled up, and became "Old-haven," and the new creek became "Newhaven," formerly Meeching. Seaford was at one time a place considered of sufficient importance to have two representatives in the House of Commons, but was shorn of them after the passing of the Reform Bill in 1832. Newhaven increases, and is certain in the future to increase greatly, but Seaford does not necessarily decrease; it is a very pleasant little town, rapidly growing in favour as a place healthy for residence, and as a pleasant summer resort. The spirited directors, general manager, and accomplished staff of the London, Brighton, and South Coast Railway Company have astutely adopted Newhaven as a port through which to interchange French traffic. Notwithstanding the harbour defects, that they are removing with so much energy and enlightened enterprise, the carrying trade of the company, and through the port, keeps largely and continuously increasing. Newhaven is the nearest place to London on the seaboard at which the construction of a good harbour is possible. It, as well as Dieppe, the companion French port, is almost on a straight line drawn from London to Paris, and the route is, in land and water mileage, the shortest between those cities. It would be safe to predict that on the completion of the harbour works the place will become of considerable commercial and maritime importance. The route from Dieppe to Paris is very attractive from its varied beauties.

The "formation" at the *débouchure* of the Ouse at Newhaven is peculiar. A considerable area on the east bank is flat marsh land. On the western bank a spur from the South Downs bends round as a high ridge that terminates abruptly at Harrow Head, close to the mouth of the river, or of the harbour as it is now. The end of the ridge, Castle Hill, is surmounted by a fort, that has on its inner sides an imposing and picturesque feature in its wide and deep moat. An excellent view of the harbour works in progress, and of the harbour, the site of the proposed dock, and of the surrounding country, with Seaford in the middle, and Beachy Head in the boundary distance, is obtained from the Castle Hill. Inland, behind the ridge, there is a considerable area of flat land well adapted for future dock or harbour extension. On this, the west side of the harbour, are the little town of Newhaven; a large timber pond; the bonded warehouses, custom-house, coast-guard station, and various other public and private buildings, the latter including a little hamlet of white huts that have been put up for the men employed on the harbour works and their families. On the opposite side of the harbour are the railway company's wharf, 800 yards long, the railway station, the company's fine hotel,—the London and Paris,—the company's engine and boiler works, with their 80-ton shears on the wharf; and, beyond these, the gasworks, engine-sheds, &c. A very wide swing-bridge, laid with a tramway, crosses the harbour close to Newhaven town. We noticed several sailing and steam vessels of considerable tonnage lying above the bridge in a fine sheet of water.

For the first quarter of the present century Newhaven was quite unworthy, either from width of entrance, depth of water, or for facilities for loading or landing passengers or cargo, to be called a harbour. It was merely a tortuous, narrow, shallow stream, that deposited some of the silt it brought down in its own bed, and, intermittently, sent down a portion to meet the shingle carried along by the tide, with which the silt united to form a bar at the entrance. The flow of the tide that brings the shingle is from the westward. The strongest gales experienced on this part of the coast are from the south-west and west. The rise of the tide, it may be mentioned, is 20 ft. at ordinary spring and 15 ft. at neap tides.

Many attempts have been made to improve the harbour, and eminent engineers have been called in from time to time to advise and report upon the means to be adopted for the purpose. In 1810 Rennie, the engineer, made a survey and reported upon the then existing state of the harbour. At that time, as he reported, there was only a depth of 12 ft. instead of 20 ft. at high-water spring tides, at the entrance to the harbour, and within half a mile from its mouth. He recommended certain works, including the construction of a pier or breakwater, widening and deepening the harbour, erecting wharfs, &c., at an estimated cost of 200,000*l*. No action was taken on his report and recommendations. At that time the management of the harbour was vested in the Upper and Lower Ouse Navigation Commissioners. In 1847 they were superseded by trustees, appointed under an Act passed for the improvement of the harbour. The trustees in their turn, made way under an Act passed in 1878, by which the management was transferred to the Newhaven Harbour and Dock Company that was then formed. If we mistake not, the directorate of the Harbour and Dock Company and of the Brighton Railway Company are pretty much "one concern."*

The harbour improvements, executed prior to 1878, were all in the right direction, and necessary parts of a large, bold, skilful, and complete plan for the enlargement and permanent improvement of the harbour. Such a plan was in that year adopted in its entirety, and the works were entered upon in accordance with the recommendations and designs submitted with a report by Mr. F. D. Banister, engineer-in-chief of the Brighton Railway Company. They are being carried out with great ability and vigour under the superintendence of Mr. A. E. Carey, resident engineer. Mr. Banister states frankly, and with becoming modesty, that his recommendations are almost identical with those made by Mr. Rennie in 1810, and by Sir Robert Peel's Commission in 1844, whose report stated that "Newhaven is a convenient tidal harbour, and may be considerably improved inwardly, as well as by carrying out a breakwater from Harrow Head into a depth of three fathoms at low-water spring tides, by advancing the piers seaward, giving a wider entrance, and dredging the channel between them." These, *inter alia*, are the important works in progress, the breakwater being the most noteworthy of all.

The flow of the tide that bears along the shingle that forms the bar at the mouth of the harbour is, as we have said, from the westward, and on that side of the entrance the breakwater is in progress. In front of the cliff that abruptly ends with Castle Hill there is a considerable stretch of artificially-levelled area that will, in time, be found very valuable for divers uses. This area has been filled in with chalk taken from the cliff; it is faced to the sea by a strong sea-wall of concrete that is about 1,200 ft. long, and stands about 6 ft. above high-water mark, and extends from the western side of the entrance to the harbour to the Fricker rocks; it curves to seaward at the west end, and the breakwater is its continuation. This important work,—the breakwater,—is to be 3,000 ft. long; about 270 yards of it, running direct out to sea, are built, and have withstood successfully many severe storms, including the memorable and terrible tempest of the 14th ultimo, to the full fury of which the structure was exposed, so to say, broadside on. The portion built is nearly straight; when further advanced the work will curve round to the east. The large water-area that will be sheltered by the breakwater, it may be here mentioned, will be dredged to a depth of from 12 ft. to 18 ft. at low water, and will certainly be resorted to as a harbour of refuge for the ships of all nations, there being no other on the south coast between Portland and Dover. Notwithstanding this almost certainly destined use, the harbour and railway companies have not received or been promised any Government subsidy, as is reasonably due to them.

In section, the breakwater has a foundation about 70 ft. wide, and about an average of 20 ft. deep from the bed of the sea to the level of low water. At this level the work is 40 ft. wide, and 30 ft. higher, or about 6 ft. above high water; the width is 30 ft.; but on the weather side a portion of the work is carried up 10 ft. higher. This portion is about 12 ft. wide at the base, and provides an arcaded covered way below and a promenade on the top, fenced on the outer side by strong and sightly iron rails and stanchions. The footway is about 16 ft. above high-water level of ordinary spring tides. The breakwater and sea-wall have a uniform batter of 1 in 8. At the outer end of the work there will be a lighthouse rising from a circular platform, about 18 ft. in diameter; it also will be of concrete, and have a total height of 135 ft. from the foundation at the bed of the sea, or 95 ft. above high-water mark. The arched openings are 6 ft. high in the clear, and 5 ft. 6 in. between the centres of the supporting pillars, that are 18 in. square, and are moulded in boxes close to the place where they are to be set up. They have plain capitals and bases, and are chamfered at the angles with short lengths of arris left at the top and bottom. A smooth-finished stair, with 12-in. treads and 8-in. risers, conducts to the promenade at the landward end of the breakwater. In this locality the concrete is prepared and carried out to the work in progress by a railway of 16 in. gauge,—Décoville's patent,—with automatic self-acting points, the handy little iron wagons used tipping their contents on either side as may be required. When the work is further advanced the materials will be taken out in a dry state, and will be mixed and wetted nearer the place where the concrete is to be used. The proportions of the concrete are,—one cement, two of sand, and five of gravel. At favourable times for working, nearly 500 tons of cement are used in a week. A large number of samples is taken from the bulk from time to time and carefully tested. The supply delivered is only accepted if the test is satisfactorily borne.

The operations connected with the submarine portion of the breakwater are specially interesting. Different methods have been adopted in the construction of such works; the great breakwaters at Portland, Plymouth, Holyhead, and other places have had the foundations laid upon the *pierre perdue* system, in which an embankment of loose stones is formed from the bed of the sea to low water by throwing in the material from stages erected for the purpose. The bank is allowed time to consolidate, and divers then dress the top and prepare for the deposit of the vast blocks upon which the superstructure is to be reared. Another method has been adopted at Dover, Cherbourg, and other places where large blocks of concrete have been employed for the foundations. In this system the disadvantages encountered have been the difficulty of making and handling under water blocks large and heavy enough to resist heavy seas, the necessity for staging to lower the blocks, and for the employment of divers to place them in position. Mr. Cay, engineer to the Harbour Board of Aberdeen, overcame these difficulties in building a breakwater at that port in 18 ft. of water at low tides; this was done without the use of stages, machinery for swinging the blocks, or the help of divers. The work has for eight years resisted successfully the heavy storms and seas of the north-east coast. Mr. Banister has adopted, with modifications and improvements, the system of Mr. Cay. So far what is practically a ridge of solid concrete 70 ft. wide and from low water level about 20 ft. deep, has been successfully constructed on the bed of the sea and carried out for about 1,000 ft.

Great weight and mass is a necessity in such work, and thoroughness and exactitude are essential in handling concrete. These *desiderata* are secured. As regards weight and mass the foundation-stones of the breakwater, using the term expansively, are 42 ft. long, 8 ft. wide, and 6 ft. deep; each of them weighs about 100 tons, and is worth between 30*l*. and 40*l*. The mixing of such a mass of materials by hand-labour with the necessary degree of rapidity is a difficult feat, and Mr. A. E. Carey, the resident engineer, was stimulated to the invention of a concrete-mixing machine driven by steam; in the production of such a machine he has been signally successful. The concrete-mixing house and machinery are situated near the entrance to the harbour. The proportions are thoroughly mixed by the machine, in a dry state; they are, by another operation, again mixed, with water added, the green unset concrete is next, shot down to the hopper of the steam barge waiting for it in the harbour below. The hopper is lined with canvas, and is of the dimensions above stated, 42 ft. long, 8 ft. wide, and 6 ft. deep. It is a little longer and wider at the bottom than the top to facilitate the discharge of the load. When the hopper is full, the canvas is laced up, and the barge steams out to the end of the breakwater, whence, by signals well understood by the workmen, the barge steams precisely to the place where the next great bagful has to be let down; the folding-doors at the bottom of the hold are opened, and the enormous mass drops into the place waiting for it and adjusts itself, before setting, to the situation. The concrete steam-hopper then returns to the mixing-mill for another load. By the method employed the services of divers and of stages are rendered unnecessary. One of these 100-ton blocks is turned out in about twenty minutes, about twenty-five labourers being employed in the work. The saving in time and labour by the use of the machine is very great, and the work is done more thoroughly and efficiently than it could be by manual labour. Upon the bags of concrete deposited, till they reach to above low water, the superstructure is built in enormous masses of concrete packed into wooden frames tied by iron rods. This work is accomplished to the level of high water in less than the interval betw en high and low water. The remainder of the structure is then added, about sixteen hours sufficing for the completion of a section. The successive masses are grooved and dovetailed into each other, so that the structure when finished is continuous. The foundation is now laid for more than 200 ft. beyond the point where the workmen are engaged on the superstructure.

Under agreement with the Harbour Company the Brighton Railway Company undertake the

* At a luncheon in the London and Paris Hotel, Newhaven, on the 13th ultimo, Mr. S. Laing, M.P., chairman of the Brighton Railway Company, presiding, The Right Hon. Sir Henry Brand, Speaker of the House of Commons, whose seat at Glynde is in the vicinity, replying to the toast of "The Newhaven Harbour Company" expressed his belief that the harbour had "a great future before it. The key to the strength of the harbour lay in the strength and security of the breakwater. No one who had visited it repeatedly, as he had done during the last eighteen months, could be otherwise than satisfied with it. It had withstood a great many serious storms, and, so far as they could judge, it would be one of the permanent institutions of the country. Having obtained a safe defence to the entrance to the harbour through that breakwater, he had not the slightest hesitation in saying that Newhaven—depending very much on the fairness of the railway company—would become the Liverpool of the south; he had no doubt of it himself; it was a question of will on the part of the railway company."

duty of dredging the harbour and the bar, and in this they have constantly at work two powerful dredging machines. One of these delivers into barges that convey the silt to sea. The other is a hopper-dredger, worked by a pair of 35-horse-power engines, and when at sea by twin-screws. It is capable of removing at one trip 500 tons of silt or shingle, and depositing it out at sea; it was built for the company by Messrs. Simons & Co., of Renfrew. During the last half-year 118,600 tons of mud, &c., were removed by the dredgers.

An eastern quay, about 1,650 ft. long, is nearly complete. The two entrance-piers will probably be finished in about twelve months, and the 24-acre dock some time thereafter. The entrance will be widened to 200 ft. For several years past from 500 to 700 men have been employed upon the works, which will not be completed for several years to come. The consumption of timber in the new entrance piers is very great. It is imported from Norway direct in shiploads.

The directors and all concerned may be congratulated upon the energy and success with which these works are being prosecuted. Whether Newhaven will ever be the "Liverpool of the South" remains to be seen; that its harbour has a "great future before it" seems certain."

THE CASTLE HILL, GAINSBOROUGH.

About a mile and a half north of the ancient town of Gainsborough, on the right or east bank of the river Trent, which there divides the counties of Lincoln and Nottingham, the high ground from the east ends in a sort of rounded bluff towards the river, and forms a noticeable feature in a county much of which is exceptionally flat. For about a quarter of a mile or so this ground is occupied by Thonock Park, but at its head, towards the river, it is covered by earthworks of considerable mass and extent, and which, though obscured by trees and brushwood, appear to be tolerably well preserved. The main work, that which occupies the brow and western slope of the hill, is in form concentric, the innermost and highest area being contained within a bank of earth, now about 8ft. high, outside and at the foot of which is a deep and broad ditch, in breadth about 40 ft. and about 20 ft. deep from the top of the bank, and with a counterscarp of about 10 ft.

Near to and outside of this ditch, is a second bank of earth, and beyond it a second ditch, the two being about the same dimensions with the inner works, with a rather lower bank, so as to be commanded from the interior. Beyond this again, but about 30 yards in advance of the second ditch, is a third bank, and beyond this a third ditch, which seems to be the outer defence of the place. The entrance is by a succession of three causeways of earth filling up the ditches, and connected with as many cuttings through the corresponding banks. This entrance is probably original. It is on the south side, and runs nearly directly through the defences, or rather with much less obliquity than is usual in hill camps. So far as could be observed through the brambles the figure of this entrenchment is rudely circular, but this figure seems due rather to the configuration of the ground than to any setting out with regularity. It was evidently intended as a camp, not as a regular dwelling. It has nothing of the character of a Saxon Burh or moated mound, but much more resembles an entrenchment such as the Britons would have thrown up to accommodate a tribe.

It appears, however, that this earthwork is far later than the British period, and the work of invading Danes. For Gainsborough has a history, some of the particulars of which extend to its contiguous villages. Gainsborough was one of the points whence the Danish invaders overran the districts of Lincoln and Nottingham, and whence they ruled the country they had conquered. Early in the eleventh century Sweyn or Swend, son of Harold Blaatand, and king of Denmark, was known and dreaded on the eastern and southern shores of England. His galleys, from the Humber, ascended the Trent, and in 1013 he established his camp at Gainsborough, and there received the submission of the five boroughs, and thence proceeded in his invasion, which speedily became a conquest, of England. His tenure, indeed, was of the briefest, for in February, 1014, he died at Gainsborough, and it was there that his followers hailed his second son, Canute, as his successor in England. Local and very probable tradition attributes to Swend and Canute the formation of the Thonock entrenchment.

Besides this principal earthwork others of a different character are described as existing and connected with it on its upper or eastern side. One is said to be oblong, and tending to the rectangular in figure, and about 150 yards by 50 yards in area. And this is on that account supposed to be Roman. There is also said to be a smaller camp, also rectangular, with a length of 80 yards, but the breadth of which has not been ascertained.

Unfortunately all this ground is carefully fenced and guarded, and has much the aspect of a favourite pheasant preserve, so that the passing traveller has no chance of giving it a proper examination; but it is probable that if the Lincolnshire Society were to make a proper application a careful and correct survey might be laid down of these earthworks, one of which, it may fairly be concluded, is not inferior in interest to any remaining in Britain.

October, 1881. C.

THE "HOMES" OF THE LONDON POOR.

Two inquests held last week illustrate the wretchedness which surrounds the lives of the very poor in London. No doubt many of the worst "rookeries" which existed thirty years ago have been removed, but that much remains to be done in this direction is only too evident to all who have looked into the matter.

The first inquest was held by Dr. Danford Thomas, at the Middlesex Hospital, on the body of Alfred Coombes, aged four months, the son of a music-printer, living at a house in Newman-street, Oxford-street, who was asphyxiated. Evidence was given showing that the parents lived in a wretched room in the basement of the house, sleeping in the same bed with the deceased and another child, a third child also sleeping in the room. Dr. Whitefield, assistant divisional surgeon of police, said that the deceased had died from suffocation, and the death was partially owing to the state of the room in which the parents lived, which was totally unfit for human habitation. The poorer classes were now, he added, a great deal worse off than they were before the metropolitan improvements and the Peabody Trust were carried out. In reference to that trust he could not help saying that it had been worse than useless. The money left by the American philanthropist had been scandalously abused. Instead of finding the poor and needy in the Peabody Buildings, the better class of artisans, earning 2*l*. or 3*l*. per week, were in possession of the rooms. The abject poor, and their ill-clad, half-starved children, still inhabited the styes to be found all over the metropolis, and still generated those pestilent diseases which over and over again claimed their thousands of victims.

The other inquest was held by Mr. Samuel F. Langham, Deputy Coroner for Westminster, at St. Martin's Vestry-hall, Strand, touching the death of William Howard, aged eleven months, lately living with his parents in Hanover-court, Long-acre, who died, it was alleged, from the unhealthy and unsanitary condition of the house. The mother of deceased said that her child had been sickly from its birth. At about seven o'clock in the morning deceased was taken with a fit, and it rallied until ten o'clock, when it had another. She had no time to go for a doctor, but a neighbour went for one. Deceased died in half an hour. The mother said she believed her child had died from the stench that came from the water-closet and yard. She had not made any complaint to the landlord until after the death of the deceased. The water-closet was outside the house, near the window. The cistern was right underneath the window, and near the dust-hole. Night-soil had been put from the closet into the dust-hole. There was no lid on the cistern. Mr. Robt. W. Dunn, a medical gentleman, deposed to having attended the house and finding the child dead, the cause of death being convulsions. Several people in the house complained of the unhealthy state of the place, which smelt of sewage. It made him sick when he entered. The foreman of the jury said that Hanover-court ought to have been shut up long ago. There are officers paid for looking after these fever dens, and they ought to be made to do it. The jury returned a verdict in accordance with the medical testimony, adding that the attention of the medical officer of health should be called to the state of the houses in the court.

The *Daily News*, commenting on this subject, says,—"So long as landlords are allowed to take rent for dwellings which are unfit to be inhabited, so long these abominations will continue to exist. If a tradesman is fined for selling adulterated milk, or bad meat, or unwholesome fish, why is a house-owner permitted to sell unwholesome lodgings with bad domestic arrangements, and water and air full of the foulest adulterations? This question is everywhere asked by those who know a little of the horrors which lie behind the house fronts in many of our streets."

MONUMENT TO COMMEMORATE THE DEFENCE OF PARIS IN 1870.

The piece of sculpture which certainly attracted the most attention in this year's *Salon* was the group by M. Barrias, "The Defence of Paris in 1870," of which we now give a view. M. Barrias obtained the first prize in a competition opened by the municipality for the best group to commemorate the above event. The figure of Paris, grand and vigorous, is represented as a young woman dressed in a military coat, and standing in an attitude of determined defence; in the right hand she holds a sword, while with the left she grasps the national colours, appearing to shield them with her body. At her feet a wounded national guard, reloading his gun, supports himself against her; on the other side, a woman, representing the country mourning, is sitting, with arms crossed, in an attitude of disconsolate grief. The *ensemble* is noble and picturesque. On looking attentively at the face of the wounded National Guard one can see that M. Barrias, with the sentiment of an artist, has intended to honour the memory of the deeply-regretted painter, Henri Regnault, killed while fighting for his country on the fiercely-contested slopes of Montretout.

The group will be erected on the Rond-point at Courbevoie, replacing the statue of Napoleon I., which was pulled down and thrown into the Seine on the direful 4th of September. The municipality have not yet decided whether to execute the group in marble or bronze; opinions incline towards the latter.

SALE OF SOUTH METROPOLITAN GAS STOCK.

The gradual introduction of the electric light invests with interest an extensive sale of stock in the South Metropolitan Gas Company, which took place a few days ago at the Auction Mart, Tokenhouse-yard. The property offered comprised 20,000*l*. of the ordinary "C" stock of the company, being the second portion of additional capital authorised to be raised in pursuance of the Company's Act of 1876, and the scheme for the amalgamation with the Phœnix Company. The stock offered was divided into 200 lots of 100*l*. each. Mr. G. A. Wilkinson, of Bucklersbury, who conducted the sale, said a dividend was payable since the price of the company's gas had been reduced to 2s. 10d. per 1,000 ft., adding that it was confidently expected that further reductions in price would take place, resulting in an increase of dividend of 5s. per cent. for every 1d. reduction. The company's reserve fund, which last year was 183,000*l*., amounted now to 190,000*l*., which was a tolerable guarantee for the maintenance of the dividend. He said that the stock would be sold with dividends accruing as from Friday, the 11th inst. The several lots were then submitted, the purchaser of any one lot having the option of taking four more at the same price. The first lot submitted was sold for 195*l*. (the purchaser taking four more lots), which represented a premium of 95 per cent. The next fifteen lots were sold for 194*l*. each, followed by twelve others at 193*l*., and thirty-three succeeding lots at 192*l*., 191*l*., and 190*l*. each respectively. From this point the prices fell gradually from 189*l*. to 181*l*., all the lots being sold. The total proceeds of the sale amounted to 36,355*l*., showing an aggregate premium value of 16,355*l*. or about 82 per cent.

The Chevalier Benedetto Albano is reported to have died in London on the 7th inst., at the age of eighty-five. He converted the old Covent Garden Theatre into an opera-house, and was for some time architect to the Board of Works at Paris and Madrid.



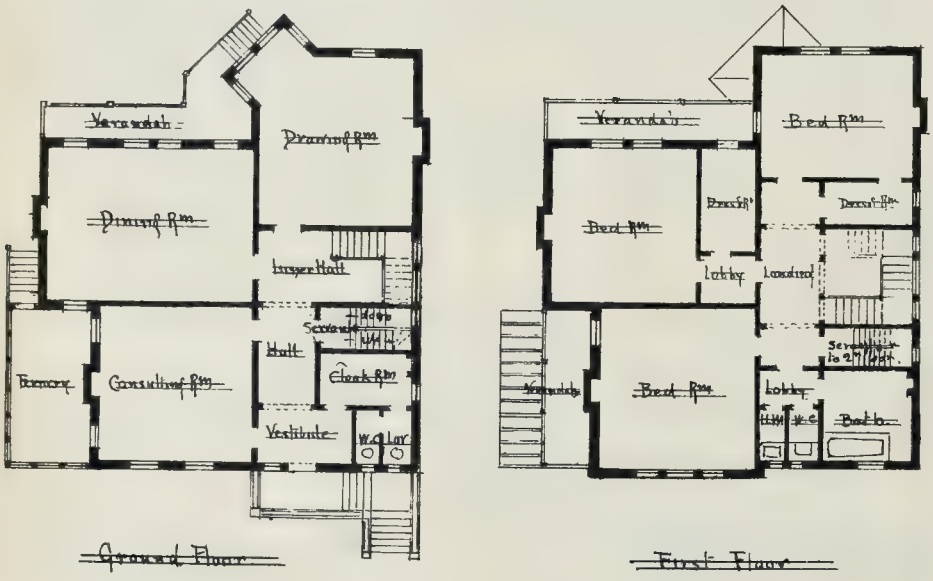
"THE DEFENCE OF PARIS": Group by E. L. Barrias, Sculptor.



Whiteman & Bass Photo-litho 236 High Holborn



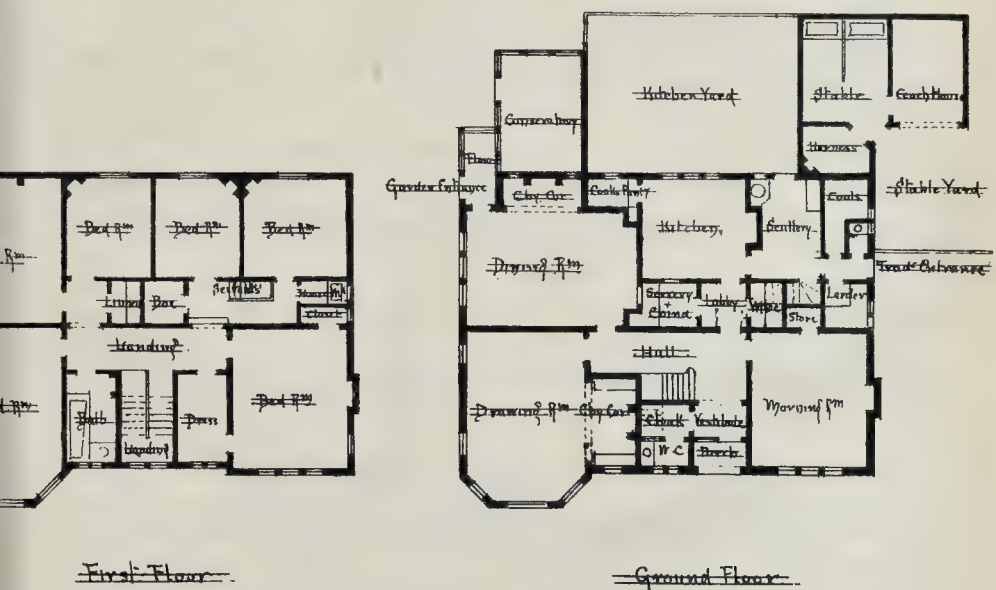
HOUSES NEAR WIMBLE



Plans of House at Woodford.

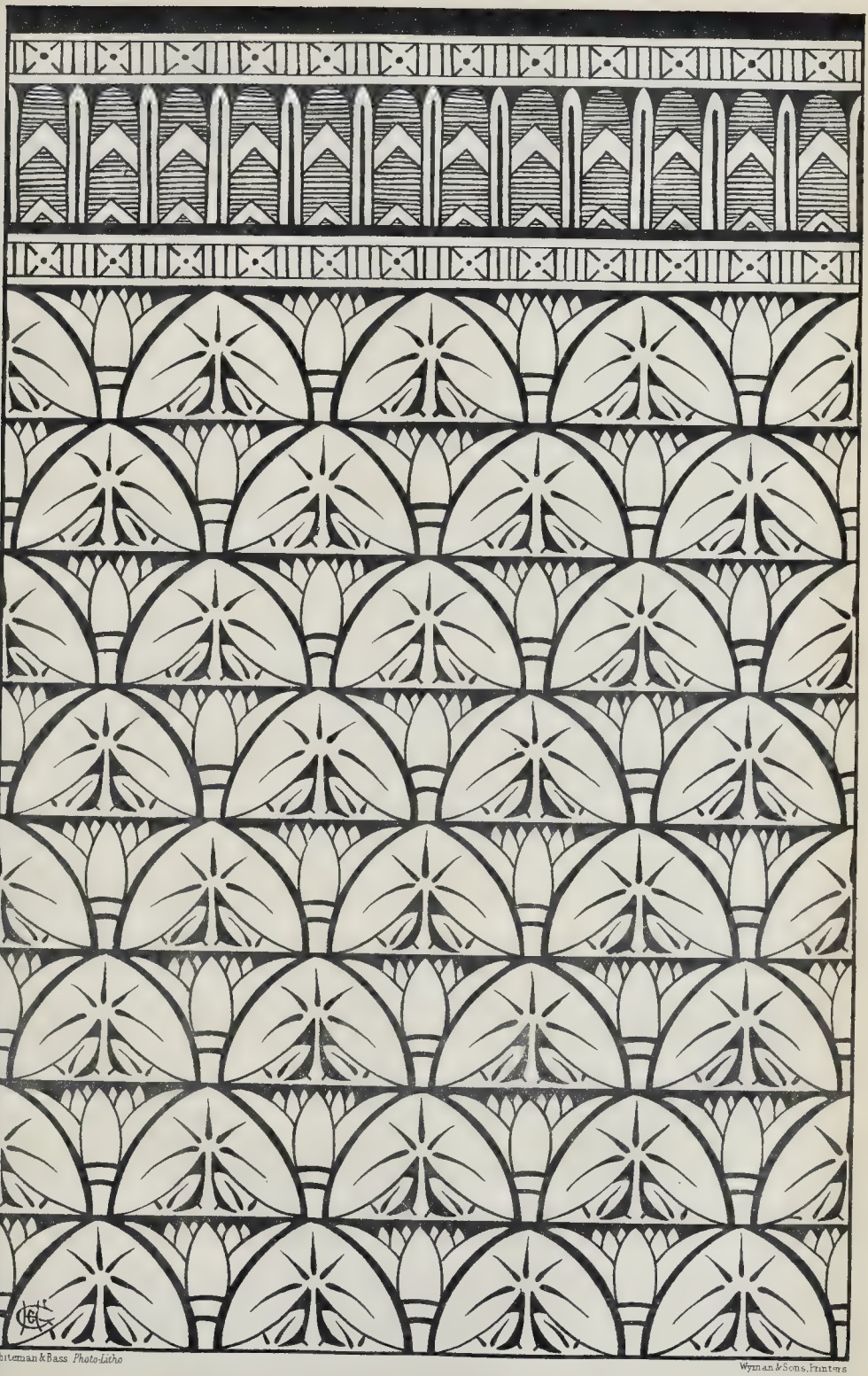


HENRY SHAW, ARCHITECT.



Plans of House near Wimbledon.

Wyman & Sons, Printers G^t Queen S^t



Whiteman & Bass *Photo-Litho*

Wyman & Sons, Printers

A DADO AND BORDER.—Designed by Geo. C. Haite.

PROPOSED HOUSE, WOODFORD, ESSEX.

This house is about to be erected from the designs of Mr. Henry Shaw, architect, of New Broad-street. The materials to be used are picked stock brick hollow walls, with red brick quoins and dressings up to first floor level; the first floor being in timber and plaster finished rough cast. The upper story in gables and under eaves will be in half-timber work; the whole roofed in with Bridgwater tiles.

HOUSES NEAR WIMBLEDON.

These houses, with slight alterations, are being erected from the designs of Mr. Henry Shaw, architect. Mr. Holloway, of Marmion Works, Lavender-hill, Wandsworth-road, is the contractor. We give a plan of one of them.

DESIGN FOR A DADO AND BORDER.

This design for a dado and border may be described as in the Egyptian style of decoration. It is suitable for printed wall-paper or stencilwork, and would adapt itself readily to any scale required. The lotus flower and leaf selected as the *motif* have been adopted from the lotus-flower so frequently used by the Egyptian painters and sculptors, and to be seen upon their sarcophagi and mummy-cases.

While studying these objects, and examining them for an example of the leaf of the lotus, their favourite flower, the designer was struck by the rarity of its occurrence. Although the flower is used so frequently, the use of the leaf is in comparison exceedingly rare. The best example discovered was pictured as springing from the mouth of a fish. Here there were two leaves, one on either side of a flower. On this example is based the leaf and treatment in this design.

Although a pattern of this kind would look well and complete in a single print, as red or gold on black, yet by the careful introduction of colour, a rich and satisfactory result could be produced. But the colouring of a design of this severe nature would require the most judicious care. It would be by far the best and most safe plan to keep to the Egyptian key of colour, while to ensure a perfectly satisfactory result, the colourist should be conversant with the principal Egyptian colours and the method of their use, or the repose of the pattern,—its greatest virtue,—would be lost. To give a key of colour, as far as words can convey, we should advise the flowers to be in a dull Indian or Venetian red, the smaller petals in a deep brownish ochre, leaves in a dull sage-green, the whole outlined with the background, which should be black, or a very deep brown or red. In the border the same colours might be used a trifle brighter, and a well-broken white introduced. As to its application, it would be best suited for a library, dining-room, passage, entrance-hall, or places of the like description, but its use would necessarily be of a somewhat restricted nature, owing to the severity of its style and treatment.

While speaking of the Egyptian style for decoration, let us say that it is to be regretted that this, the foundation and fountain of all decorative art, should be so little known, and still less appreciated.

A lecture-hall decorated in this style would possess an air of repose and solemnity that no other style or treatment could give.

FULHAM INFIRMARY COMPETITION.

The Guardians have adopted the report of their referee, Mr. H. Currey, and have awarded the first premium (100 guineas) to the design marked "Experience," and the second (50 guineas) to "Simplicity." The authors of No. 1 are Messrs. Giles & Gough, 28, Craven-street, Strand.

The referee, in his report, says the design, "Experience,"—

"Has been carefully worked out. The arrangement is very simple, admitting of easy supervision, and ready communication with the different departments. A straight corridor running the whole length connects the different buildings, which are laid out in what is technically called the pavilion principle. All sanitary requirements have been fully observed. The dimensions of the blocks for the patients have been generally determined by the Instructions, but the size of the administrative department has been left to the discretion of the architects. This appears to me to have been provided on a judiciously ample scale sufficient to meet the requirements of the future extensions, which have been also duly considered."

BUILDING STONES OF SCOTLAND.*

No inquiry can be more interesting or of greater importance to the architect and builder than that respecting the nature of the material which they have to use in the buildings they may be entrusted to design and erect. From the Solway on the south to the Pentland Firth on the north this country is full of a variety of rocks suitable for building purposes, and this is shown by the massive, elegant, and enduring structures of past ages, edifices of so much value both historically and architecturally. When the appliances for quarrying were of the most primitive kind, and the means of conveyance to any distance a work of great difficulty, the architect was forced to adopt a style of building suited to the material nearest at hand; but now, with railways interspersing the country, he is not tied down to any particular stone or material, but may adopt that which he finds best suited for his purpose. What the architect has to look for is a stone that will be durable, strong, and of a colour which will best bring out the architectural features of his design. With the view of noticing stones that have been used in some of the oldest structures before referred to, as well as those of more modern date, I have had cubes of sandstones and granites prepared, so as to bring before the Association in a practical way some information respecting those stones most useful for building; and, to do so, I would begin by noticing the building stone that has been used in our own city. In the older buildings, such as Heriot's Hospital, Holyrood, and the residences of the Old Town erected centuries ago, the supply was drawn from quarries in the immediate vicinity, an example of which is shown in specimen No. 1, taken from the old red sandstone found on the southern side of the town, which has been tested by time, and proved to be of the most durable kind. In the New Town, when quarrying appliances were better understood, other quarries were brought into use, such as Craigleith, Ravelston, and Redhall. These were chiefly used before the canal and railways afforded means of bringing stone from greater distances. Then Binnie and Humbie by the canal, and later on by railway such quarries as Dunmore, Polmaise, and Plean in Stirlingshire, Dalmeny in Linlithgowshire, Fairloans, near Hawick, and the quarries of Lanarkshire, such as Overwood, Giffnock, Auchenlee, and Dalzell, specimens of which are now before you. The respective qualities of the stones I have referred to I will now notice; and taking together Craigleith and Redhall, as occupying the same position geologically (being of the lower sandstones of the carboniferous strata, or perhaps better known as the carboniferous limestone groups) their analysis may be taken as an index of what goes to constitute stone of the most enduring kind, viz.:—

Silica	98·3
Carbonate lime	1·1
Iron and alumina	0·6
	100

To specify examples of these in the city, as affording proof of their durability, I would notice:—1. Craigleith, as shown in the Old University, and many of our finest squares and streets in the northern portion of the New Town, while a notable example, not only of the stone, but of what I consider the best masonry in the city, is the tenement at the northern corner of Randolph Cliff. 2. Redhall.—St. Paul's, in York-place, and St. John's, in Princes-street, as public buildings, are good specimens of this stone as to durability and quality, the carving on them being as sharp now as the day it was chiselled. 3. Humbie and Binnie quarries belong also to the carboniferous limestone group amongst the shales. The Humbie stone was greatly used some thirty-five years ago, and specimens of it are to be found all over the city, but it was abandoned through being unable to compete with other quarries. 4. Binnie may be set down as a stone of the first-class. The first prominent specimen of it was the New Club in Princes-street, built about forty-five years ago, and adjoining it the palatial building of the Life Association of Scotland. The following public buildings were also taken from it, viz.:—Scott's Monument, National Gallery, the Bank of Scotland, British Linen Company's Bank, Commercial Bank, Donaldson's Hospital, and the Post Office. Owing to this quarry being situated among the shale beds, the best fakes are saturated with bitumen, and this is so abundant that I collected a quantity and sent it to the Exhibition of 1851 in the shape of black candles, which the jurists simply noticed in a very short paragraph. Stones that have been extensively used since the advent of railways are those of Dunmore, Polmaise, and Plean. These all belong to the upper part of the carboniferous limestone group, the two former, however, lying above the Plean sandstone. These stones have been greatly used, not only in this city, but in Glasgow, and from Stirling northwards. They are pure sandstones, having a large proportion of silica in their composition. Buildings from Dunmore are the New Post Office, Bank of Scotland, Merchants' House, and Union Bank extension, Glasgow. These stones are preferred for their pleasing colour and durability, while the cheapness of dressing them overcomes the expense of bringing them from such a distance. The Dalmeny stone is of more recent introduction, but perhaps one of the best tests of its durability is that of Dalmeny Chapel, which was no doubt built out of the same strata, so long ago that little or nothing is known of its history except what can be obtained from its architectural character. Another stone in the immediate neighbourhood is that of the Hailes, which has been worked for 200 years at least. This stone, owing to its laminated structure, is used greatly for foundations of buildings, plats, steps, &c. A stone which was used in the renovation of St. Giles's Cathedral about fifty years ago (now being so admirably restored to its original architectural beauty through the munificence of Dr. Chambers and the careful superintendence of Mr. Hay) was taken from a quarry lying to the west of Burntisland, called Callalee. This quarry was for a long time abandoned, until it was re-opened by the late Mr. Bryce for the erection of Fettes College. The stone is durable, but owing, I believe, to the expense of quarrying and difficulty of dressing, it has not continued in use. Another stone in the same district as the above is that of Grange, which has been long in use, particularly in Leith, and a specimen of which is to be seen in Dalkeith West Parish Church, built about forty years since. This stone belongs to the carboniferous period, below the shale, and about 20 fathoms above the Burdiehouse limestone. In mentioning Burdiehouse I am reminded of the Straiton stone, which lies almost in the same position geologically as the Grange, and Dallachy, in Fife. Another stone which has been brought into Edinburgh, and which is of excellent quality, is that of Fairloans, near Hawick. It is capable of a high polish, and greatly used for monumental purposes. It will be observed from the following analysis it is formed nearly of the same chemical ingredients as Craigleith and Redhall; and this refers also to such quarries as lie in the Bannockburn district, such as Dunmore, Polmaise, and Plean:—

Sand	95·64
Oxide of iron	1·62
Carbonate of lime	1·20
Carbonate of magnesia	0·52
Moisture	0 60
Loss in analysis	0 42
	100·0

Going westwards into Lanarkshire, and treating of stone used largely in Glasgow, as well as brought to this city, the Kenmure Quarries may be first mentioned. They belong to the carboniferous limestone, and lie above the Bishopbriggs coal-beds. They were worked to a great extent for many years, but now, I believe, are abandoned. A section of this rock may be seen at the upper end of the Queen-street Tunnel, Glasgow. Of the best stones, among many others in this county, are Giffnock and Overwood, both near Glasgow; also Auchinlee and Dalzell, and the Wishaw Quarries, all of which are among the upper coals of the coal measures. Among the buildings erected from Giffnock Quarry, in Glasgow are the Academy, *Herald* Office; from Overwood, new Municipal Buildings, Greenock; City of Glasgow Bank, and new Stock Exchange, Charing Cross Hotel, and Clydesdale Bank, Glasgow. Another stone of reddish colour, which lies immediately over the coal measures in the bottom of the new red sand stone, near to Hamilton, is of good quality, and is used extensively in that and the surrounding districts. This stone is exposed in a quarry which may be seen from the Caledonian Railway Glasgow line. Before leaving this country, Bellside Quarry may be noticed. It lies in the true coal formation. Going south and west, we pass through stone strata, both yellow and red

*Read at the meeting of the Edinburgh Architectural Association, 20, George-street, on the 15th of November, by Mr. Gowans.

in colour. Of the latter, the Ballochmyle stone, of which the magnificent viaduct on the South Western Railway is built, is a fair specimen. Further on, we get into the old red sandstones of Dumfriesshire, of which specimens are submitted. To the east there are the yellow sandstones of Langholm Hill, as well as the red sandstones found in the Hoddam district, all of which are good building stones.

Coming back to the north of the Tay, the old red sandstone is found to overlie the country from Lochlomond along the face of the Grampians to Montrose, where stones for building purposes are to be found. The most important workings of this strata are those of the quarries which supply Dundee. Mylnefield Quarry may be noted for a stone not only durable, but capable of resisting an enormous pressure without fracture, so much so that in the erection of the Rallochmyle bridge, before referred to, that stone was carried across the country at great expense to form the ringhead of the centre arch, which has a span of 180 feet, and a height from the bed of the river to the keystone of the same dimensions. In mentioning this quarry, one is surprised that in restoring the Tay Bridge such stone as this is not used, instead of a combination of artificial material such as brick and iron. The crushing strength of this stone is given at 425 tons per square foot.

In speaking of Forfarshire, I cannot fail to notice the quarries which supply pavement, not only to this country but to all parts of the world; and as one of the industries of that county, and as showing the development of that trade, the Carmyllie Quarries, near Arbroath, fifty years ago, were worked by the aid of a single-power crane and a windmill for pumping the water from the bottom of the working, the few stones got in that way being carted a distance of about seven miles across the moors to Arbroath for shipment. About twenty-five years ago, in connexion with the late Earl of Dalhousie and a friend, I made a railway from the main line to the quarry, which has had the effect of developing the trade to such an extent that, instead of the windmill and the old crane, there are now ten planing-machines, besides stone-cutting machines, moulding-machines, &c., worked by seven steam-engines, showing the extensive use that is made of that stone not only for paving, but for steps, plats, &c. Specimens are now laid before you. The crushing strength is given at 500 tons per square foot. In speaking of the old red sandstone as useful for paving, the Caithness stone must not be overlooked, and for wear and tear it takes precedence of all others. As another branch of industry the development of this trade is quite as important as that of the Forfarshire stone before referred to. As an example of the value of this stone when subjected to continued wear and tear, the pavement in front of the New Club may be quoted, which was laid down forty-five years ago. Another example showing the same quality of durability, and also the size of stone that can be produced, is that in front of the Register Office, which was laid when the screen wall of that building was set back some thirty years since. The crushing test of this stone is given at 420 tons per square foot. In referring to sandstones, the length of this paper precludes me from giving in detail a description of the numerous quarries, and the immense quantities of good stone that lie along the eastern edge of the Moray Firth, of which Elgin Cathedral is a most notable specimen. Besides the care which the architect and builder should take to make themselves acquainted with the nature of the substance of which the stone they are to use is composed as to its durability, it is of importance, where great weight has to be carried, that its power of resistance to pressure should be known, as well as its tensile strength. The difficulty, however, is to ascertain from the compression of small cubes the relative strength of what the same material would be if enlarged in size. This was very forcibly brought under my notice by taking part with the late Mr. Buchanan, C.E., in testing stone and brick for the chimney of the Edinburgh Gas Company at the North Back of the Canongate, erected in 1845. These tests were made in the most careful way, by crushing cubes of 1-inch square of stone from the following quarries:—

RESULTS OF TESTS.

	Crushed at Tons per square foot.
Craigleith	315
Humbie	240
Hailes	235
Redhall	215
Binnie	182

A second test of Craigleith showed that, before being crushed to powder, it sustained a pressure of 440 tons per square foot. The appearance after fracture of the different cubes was that of a pyramid or wedge, and this led me to assert that if the cubes were enlarged a greater increase of strength would be gained; and, further, that if the pressure was vertical to the line of cleavage a greater resistance would be got, so that such a stone as Hailes, which is a laminated stone, would increase in strength, according to its surface, more in proportion than that of a liver-rock stone, such as Craigleith, Redhall, or the other stones that were tested. This led to discussion and further trial, the result being that, with a 4-in. cube from Hailes quarry, the resistance was equal to 567 tons per square foot. It may be worth while to give the results of the experiments we made in testing the brick. A great many different kinds of bricks of different composition were tried, the result being as follows:—

No.	Description of Specimen.	Dimensions. Length.	Breadth.	Thickness.	Weight.	Crushing Weight on each brick.	Crushing Weight per sq. foot.
		In.	In.	In.	Lb.	Tns.	Tns.
0	Common Fire Brick	9	4½	2½	7¼	89½	311
1	Extra size and quality from Mr. Livingston, Brick Work, Fireclay, and Ironstone	10	5	3	10½	153	440
2	Do. do.	9½	4½	2¾	9	140	443
3	Do. do.	9	4½	2¾	9	89½	285
4	General quality	9½	4½	2½	9	63½	204
5	Do. do.	9½	4¼	2½	9	140	443
6	Same quality as specimens sent to Glasgow	9½	4¼	2¼	7¼	51	135
7	Common stock brick taken at random from a building	9½	4½	2¼	8	51	150
8	Do. do.	9½	4½	2¼	8	25	73
9	Common general quality bedded with mulled board	9½	4¼	2¾	9	51	153
10	Do. bedded with clay	9½	4½	2¾	9	140	443
11	Do. do.	9½	4½	2¾	9	153	489
12	Stone from Hailes Quarry	4	4	4	5½	63	557

As to tensile strength, this is also important to the architect where corbelling, steps, plats, &c., have to be used, as well as in stones which have to be placed over voids, where both crushing and tensile strain are combined. The following were the results after careful and repeated experiments:—

	Breaking weight. Tons.
Craigleith stone	453
Hailes stone	336
Redhall stone	326
Humbie stone	283
Binnie stone	279

Although I did not test Arbroath and Caithness pavement, the following may be taken as safe:—

	Breaking weight. Tons.
Arbroath	507
Caithness	417

As to the resistance to pressure and tensile strain, the architect and builder should, after satisfying themselves as far as tests can, keep in view that the stability of the structure depends a great deal upon the proper constructive use of the material. Unless stones are fairly bedded there will be weakness and fracture, and unless the style of masonry adopted admits of every stone taking its equal share of the superincumbent weight put upon it there will be failure. This leads me to notice what I have observed with regret in the architect or engineer mixing the character of the masonry in such a way that one stone has more to bear than another. I have seen viaducts, for instance, built with rubble masonry of all sizes in the piers, while the corner-stones were made of increased dimensions, the result being that when the strain came, these corner-stones were fractured by the load pressing unequally upon them. But this leads me away from my text, so I hesitate to go further.

Another consideration for the architect is using stone which absorbs a great quantity of moisture. I have found, for instance, extensive buildings erected in a wet country with a stone which absorbed moisture to such an extent that the dampness which penetrated the walls not only rendered the house unequal in temperature, but led to the decay of the timber which passed into the walls; and caused what was called "dry rot," but what was really nothing else but wet rot, or timber taking consumption from lying in a damp bed. Vitruvius, the Roman architect, 2,000 years ago, says some very wise things both as to stone and timber. He recommends as to stone that it should be quarried in summer, and seasoned, by being allowed to lie two years before being used, so as to allow the natural sap to evaporate and test the stone as to its wasting; and for timber, he says, it should not be cut down in the spring, but in the autumn when nature is dormant. But this, again, I feel is leading away from my subject, so I come back to treat on Granite. Following up the northern district, I may take, first, what has been done by the well-known firm of Messrs. Macdonald, Field, & Co., from their extensive quarries all over Aberdeenshire. Fifty years ago the uses of this enduring material were confined chiefly to local purposes, although long before then a considerable export trade was done in street pavement, as well as more important works, such as lighthouses, docks (Portsmouth), bridges (Waterloo and London). The development of its various uses, both red and grey, was brought about principally by the energy and enterprise of this firm, while by the introduction of machinery that obdurate but enduring material can now be dressed with the greatest accuracy and finish at a cost greatly less than could be done when operated on by hand. Other gentlemen who have developed this trade were the late Mr. Gibb, and latterly and at present Mr. John Fyfe, whose quarries of Kemnay and Cove, near Aberdeen are the largest in the country for the production of stone used for curb and paving, as well as for the larger blocks required for such works as the Thames Embankment, part of which he supplied. There is so much to interest and instruct in a visit to the works of Messrs. Macdonald and the quarries of Mr. Fyffe that members of the Association could not spend a more useful holiday than in going to see the various applications of machinery in dressing and polishing such a stubborn stone, where columns and such like are turned with as much apparent ease as that of the wooden baluster of a staircase. Specimens of granites from the quarries of Messrs. Macdonald, Field, & Co.; Mr. Fyffe; and Messrs. Shearer, Field, & Co., are on the table, as well as a stone showing a very singular junction of colour, one half being of a beautiful red, the other grey; and this, I understand, divides the hill in a straight line from top to bottom. Returning to the south, I have to mention the extensive quarries and dressing machinery of Messrs. Shearer, Field, & Co., and Messrs. Newall & Co., at Dalbeattie. The Dalbeattie granite is obtained from deposits on both sides of the river Urr, near the town of Dalbeattie, in Kirkcudbrightshire. In colour it is a bright clear grey. It is a hard, close-grained granite. The close aggregation of its different minerals is a very important feature in it, and makes it well adapted for engineering and building purposes. It is also very suitable for ornamental purposes, as it is uniform in the grain, takes a fine polish, and is agreeable in colour. This granite was brought to the front for engineering and paving purposes about twenty years ago, by Mr. Hugh Shearer, of Great George-street, Westminster. He had the first contract for the supply of the granite for the Thames Embankment at Westminster, and got it approved and introduced into that great national work. Since then he and his firm have steadily and energetically used it in many other important works, such as docks, bridges, fortifications, lighthouses, and fronts of buildings. The same granite crosses the country very much in the route of the Portpatrick Railway, and was used for the principal viaducts on that line on to Creetown, where at Kirkmabreck extensive quarries were opened by the Liverpool Dock Trust, who not only built their dock walls with it, but the dock offices and sheds. It is worth noticing that the engineer who first opened up these quarries adopted a style of building by using the blocks at random, of all shapes and sizes, the same as was done by the Roman masons, and which, apparently, has the same endurance as to structural stability.

I come now to speak of the value of this material with regard to its strength. While tests have been made to ascertain its resistance to pressure, too much dependence must not be placed on results given in text-books. Granite, like other material of which I have had experience, has a cleavage the same as sandstones have, although this is not the popular opinion, and would be condemned by the orthodox geologist, as it touches on the theory as

asserted of granite being an igneous and not an aqueous rock. I mention this not for the purpose of geological dispute, but to reiterate what I have before asserted as to sandstone, viz., that to use granite so as to get the greatest resistance to pressure, the stone should be used so that the force should be at right angles to the cleavage or bedway of the materials. That brings me to this, that granite, like sandstone, laid upon its natural bed, will increase in strength in the ratio of its superfice. However, I repeat as to crushing that if granite is fairly bedded on an equal and resisting foundation no load can in ordinary circumstances crush it. It may be safe enough in dealing with granite, to take from 684 to 848 tons per square foot as a fair test of its strength. The remarks I have made as to granite apply also to other rocks such as trap, graywacke, and mica-schist rocks, which are to be found in districts where sandstone may be too expensive to get. The method of using these for building is admirably shown in Hawick, Galashiels, and places where such stone is readily found. If properly treated, nothing can be more enduring or more suitable for harmonising with the landscape of the district in which it may be placed. A popular fallacy is that these rocks draw damp. This is not the case; they condense the atmosphere in the same way glass does, and if this is provided for in the building, there is not the slightest danger of any water penetrating the walls. In acknowledging the honour you have conferred upon me in asking me to bring this paper before you, I feel that the short time I have had for preparation has not allowed me to give the subject the justice it deserves, neither would one lecture be sufficient to exhaust it. I feel very much in the position of a hewer, who has merely roughed the stone, and who has not had time to continue the operations necessary to give that finish to the surface which might develop beauties and results that could never be seen in the rough. The selection for use of a material such as building stone goes much further than ordinary observation. Enduring structures speak not only of the habits of the people, but of the civilisation they have attained. The enduring Pyramids of Egypt, the ancient buildings of Greece and Rome, the Temples of Cambodia (which country has no history except in the elaborate limestone buildings which remain), show that the profession of an architect has to do with what every nation should prize, that is, that to all time their architecture should faithfully represent, as far as it can, the people with whom it originated.

The lecture was illustrated by specimens of the various stones referred to.

At the close, Mr. Lorimer proposed, and Mr. Whitelaw seconded, a vote of thanks, which was heartily accorded.

THE CHISWICK SCHOOL OF ART.

This institution, situated on the Bedford Park Estate, Turnham-green, has been opened for work some six or seven weeks, and bids fair to be successful, for already it has 140 students on its roll-book. The building has been erected from the designs and under the superintendence of the honorary secretary of the school, Mr. Maurice B. Adams, architect, who has aimed at giving it a distinctive character while making it to harmonise with the peculiarities of its surroundings. Only a portion of the building is yet erected, larger studios than those now in use, and other additions, being intended in the rear when the wants of the school call for increased accommodation. The apartments now in use appear to be well adapted to their purpose, and are suitably furnished and provided with all necessary appliances. The furniture throughout the building, including the revolving model-throne, was made by Messrs. Robertson & Sons, of Alnwick. Special attention has been paid to the gas-fittings, which are adapted to the use of the different classes, and provided with reflectors and ventilating exhausts, executed by Mr. Elsley, of Great Portland-street. The details of colour internally, and of all necessary apparatus for school work, have been arranged by the directors of the school (Mr. E. S. Burchett, of the South Kensington schools; and Mr. F. Hamilton Jackson, formerly of the Slade School) The building was on Saturday evening last the scene of a "house-warming," in the shape of a *conversazione*.

Mr. A. J. B. Beresford-Hope, M.P., in taking the chair at a meeting held later in the evening, said he was glad of that opportunity of making himself personally acquainted with one more of the noble network of institutions which had spread and were spreading a knowledge and love of art in this country. Planted as it was in Bedford Park, in a very city of art, and being almost a part of that great and important experiment of making a London dwelling graceful, picturesque, and lovable, as well as inhabitable, the Chiswick School of Art started under very exceptional advantages, and was likely to take a foremost place amongst its brethren. Students at schools of art might be divided into two or three classes. First, there were those who went there for technical instruction to help them on in the path of life which they had chosen to follow, and who exemplified the noble quality of self-help. Secondly, there were those who went for elegant drawing lessons: of that class he would say nothing at all. There was a third class, to whom he should proceed to address himself, viz, those who, whether they had taken up the study of art as a profession in the highest sense of the word, or whether they had taken up as a pastime, also in the highest sense of the word, meant to pursue their studies thoroughly, and to derive the utmost advantage they could from the instruction which they would receive. To this class of students he wished to point out that education in art was education in a great deal more than the mere mechanical facility of transferring to paper or putty the forms which the students saw before them. The drawing or model produced by the student had its value, but that was as nothing compared with the value to the student of the exercise of his mental and moral faculties which the production of the drawing or model necessitated. Such exercises would bring home to the mind of the pupil as nothing else could do that great divine law of proportion, which governed all things, and was at the bottom of all things, moral, metaphysical, and natural. Was not the virtuous man the man who had all his qualities in due proportion,—the wise man, he who had his reasoning powers in due proportion,—the wit, he who had a knowledge of grave and gay in due proportion,—the poet, he who had a knowledge of things seen and things unseen in due proportion? One of the greatest surgeons of the day, who began life as an artist, and who was still one of our best water-colour artists, had stated that he conceived he had gained great benefit in his professional education and work from his art-training, which had taught him sharpness of eye and neatness of hand. There was no royal road to art, and the students of schools of art should not rest content when they had acquired a slipshod, scratchy method of sketching, which, whatever drawing-room popularity it might bring them, would never bring them fame as artists. Perfection in art could never be reached without assiduous study, constant thought, and continual striving after improvement. The cleverest sketches were those which contained the fewest lines, and which depended on the outline for effect instead of on a mass of stippled work, but the artists who made those clever outline-sketches had only attained their skill gradually and by dint of hard study, dispensing bit by bit with stippled surfaces. Although it was not likely that any student in that school would ever become a Turner, a Teniers, or a Raffaelle, that was no reason why every student should not do his or her very best to excel. He exhorted them to set-to with a hearty spirit of goodwill, good temper, and good-humoured through dogged determination to succeed in the race.

Mr. T. Armstrong, Director of the Art Department at South Kensington, said he had been much gratified by what he had seen on the Bedford Park estate, and especially by the cheerful and well-appointed School of Art in which they were assembled. As he had had but a short experience of seven weeks only in his official capacity, it would be presumptuous on his part were he to attempt to enter at length into the subject of the best mode of carrying on the work of the numerous schools of art which were governed from South Kensington. There were colleagues and coadjutors of his at South Kensington who were more competent for that task. He entertained the greatest respect for the methods of teaching pursued by his predecessor and his staff, whose methods would be continued substantially unchanged, although there would be further developments as requirements called for them. He wished very much to stimulate the study of modelling from the figure, and should like to see life classes formed in every country town. It was his own feeling that painting from still-life had been a little overdone. He would not propose to discountenance it altogether, but a little less of it would suffice. He believed he had the authority of his political chiefs, Earl Spencer and Mr. Mundella, for saying that the tendency of art education at South Kensington under the Department would be towards fostering the arts of design in connexion with industry. That, in his opinion, was the *raison d'être* of the Department and of the schools in connexion with it. Art education, provided at great cost to the State, should not aim at producing a race of painters of pictures. He hoped and believed that in connexion with the schools of art, the technical schools, of which so much had been heard lately, would have increased influence for good on the industries of this country. That the art schools under the care of the Department had done much for the industries of the country was testified by foreign nations, particularly France and Germany, who were imitating us in our methods of art education, and were sending over distinguished men to examine into our system and report upon its results, with which they expressed themselves to be very agreeably astonished. He trusted that the advice which Mr. Beresford-Hope had given to the students would be taken to heart by them. The people who resided on the Bedford Park estate owed great thanks to Mr. Carr. He was the Moses who had brought them out of the Egypt of darkness and filth which lay to the eastward. Bedford Park, with its picturesque houses, its pleasant club, its school of art, and its æsthetic public-house where unadulterated spirits were sold, was, he thought, a very desirable place to live in, and he wished all happiness and prosperity to its colonists.

Mr. George Augustus Sala moved a vote of thanks to Mr. Beresford-Hope for the address which he had given, and urged the students of the Chiswick School of Art to be earnest in the pursuit of their studies. He observed that the success which schools of art had met with awakened in his mind sad reflections, and he advised those who welcomed their success to read the autobiography and letters of Haydon, who strove for many years to establish schools of design in this country, and almost wore out the stairs of Downing-street by his vain footsteps after Ministers. He was laughed at for his pains, and treated with indifference and contempt. The great Duke of Wellington, in a curt note to him, told him that there was no chance of Parliament devoting a halfpenny of the public money for such a purpose. But everybody knew what had been the result of the establishment of art-schools in this country, the success of our system having been so great that even France, the mother of European arts, herself came to learn of our work. Mr. Sala concluded by humorously referring to the days, forty years ago, when he was a pupil at a Pestalozzian school at Bolton House, Turnham-green. Among other accomplishments which he learned there was that of being able to design a sort of ornamental pediment containing a figure of Minerva rewarding the young gentlemen of Bolton House for diligence in their studies by presenting them with cornucopias, pairs of compasses, beehives, &c. The work was executed in plaster by an Italian gentleman in Leather-lane, and duly affixed to the front of the house, where it remained for many years; but, alas! it and the house had, within the last few years, totally disappeared.

THE EDUCATION OF SURVEYORS.

In the course of the opening address at the Surveyors' Institution, on the 14th inst., made by the President, as mentioned in our last, Mr. Edward Ryde said:—The scheme of technical education is believed to have been of very material assistance to us in obtaining our charter. I have always been an ardent advocate for the extension of education; but I am bound to say that I approached the consideration of the question as applied to the admission of members of this Institution with much caution and reflection. That I did so is the more satisfactory to me now that I have formed a mature judgment that the course which the Council finally adopted, and which they have now to carry out under the charter, will be conducive of much good to the profession. The subject of education generally is a very extensive one: its con-

sideration and development have become very popular and almost universal, and no profession can safely refuse to give it attention.

As showing to some extent the direction in which general opinion is running in connexion with this subject, I may mention that the International Committee of the Surveyors of Europe, sitting as a Congress in Paris, in 1879, discussed, among other questions, the desirability of requesting the respective Governments of the several countries represented at that Congress to institute by compulsory enactment that every surveyor should take out a diploma, after the manner of the surgeons and apothecaries of England, previously to being permitted to practise. But the English deputation to this Congress was of opinion that its own Legislature would not be likely to interfere in favour of a profession, at the instance of such profession, without some special demand on the part of the public. They further urged that after all, too much importance must not be attached to the possession of such a diploma, inasmuch as the real qualifications of a surveyor could only be acquired after years of experience, coupled with integrity, perseverance, and intelligence. Hence it constantly happened that surveyors of large experience were taken from one part of England to another on account of the special qualifications which they possess,—a distinction which the possession of a diploma acquired in early life could not command. In no professions in England, except those of Law and Medicine, was any compulsory examination required, except as before mentioned. This was to be accounted for or explained in the case of Medicine by the fact that the consequences of incompetency might involve questions of life and death; and the same might be said with respect to the legal profession in connexion with criminal law. It would also be observed that the same rule applied in the cases already referred to of surveyors appointed under the London Building Act, where infringements of the law relating to the construction of buildings might lead to fatal consequences. In the case of other professions, incompetency generally merely resulted in pecuniary loss, which, it was assumed, might have been guarded against by a careful selection. But the English deputation was, nevertheless, prepared to vote in favour of a diploma, which they could understand was probably more needed in France than in England, owing to the compulsory subdivision of property at the death of the owner, and the consequent necessity for a numerous class of surveyors of ascertained skill whose services should be within reach of everybody.

I cannot do better than refer to the very excellent speech made by our much-respected first Associate of Council, Mr. J. H Lloyd, at the first meeting of the Institution of Surveyors, which speech will be found reported in vol. i. of our Transactions, at p. 14. I cannot describe to you the advantages of our Institution in words so happily put together as those which were then used by Mr. Lloyd, and all I can say is that any member of the Institution who has not read that speech would, I think, find pleasure in doing so. Taking that speech as my model, and pointing to the charter which we have obtained as the result of the labours of the Institution down to the present time, I think I may fairly assume that the effect of the charter has been to transform our Institution from a private society into a public body, having a fixed and well-settled constitution, with by-laws which cannot be altered without the previous approval of the Privy Council.

Although it is not made compulsory for a period defined in the charter for a surveyor to pass an examination prior to his election as a Professional Associate, it is open to the Council to frame rules so as to enable him to submit himself for examination at once, and in the same way the admission of Fellows may be facilitated. It is satisfactory to find that a considerable number of young men are availing themselves of the educational courses of the charter. Many have already joined the student class, and many others are preparing to do so. They see the advantage which a certificate so obtained will give them at once when the next opening shall occur, whether they look to get appointments or clerkships in the offices of others, or start in practice on their own account. To employers, moreover, the advantage of the certificate will be most useful as a distinguishing mark between those who have been brought up to the profession and those who have not.

If I am asked what I consider to be the best course of education for a surveyor, I may reply that I consider any of the subjects which are contained in the educational course of the Institution desirable; but it is impossible for any one man to qualify himself for practice in every branch of the profession. A surveyor and land agent should have a thoroughly practical knowledge of agriculture, including a knowledge of agricultural chemistry and geology; he should also make himself a good accountant and bookkeeper. He should possess a knowledge of measuring land and making maps, a knowledge of timber and the art of measuring it, and, above all things, he should acquire, in as practicable a manner as possible, a knowledge of the best systems of managing estates.

The recent depression in agriculture, and the troubles which have befallen the landed interest generally in recent times, have rendered this last qualification more important than ever. However much the practice of agriculture may have been retarded, recent difficulties have shown more than ever the necessity for the services of skilled land-agents. It has been very much the custom during the last quarter of a century to assume that estates can be managed by gentlemen who have not had suitable previous training. It seems to me that that state of things must now be brought to an end. A land-agent responsible for the management of a large property must be able to determine by his own experience the exact amount of rent which a farmer can afford to pay under every circumstance which can arise. Moreover, the complaints of a tenant must, on the one hand, have proper attention, and, where necessary, must be met by relief or remedial measures; on the other hand, if every complaint of a tenant is to result in a reduction of rent, or some other advantage to the tenant, and disadvantage to the landlord, it will soon be found that there will be universal complaints, and that the landlord's interests will suffer. Again, an agent must be able to discriminate between a beneficial expenditure of capital and one which is not beneficial. On some estates it may be very advantageous to expend large sums of money in rebuilding farm buildings: on others it may be a great waste of money; as, for example, in the case of land near London or any other great centre of population, which, after a few years from the present time, will become building land.

If a surveyor has intended to devote himself more particularly to the business of a building-surveyor, or, in provincial towns, to that of an architect and surveyor, he will, of course, turn his attention more particularly to the valuation of buildings and building lands in town than to agriculture and the management of country estates. Some knowledge of architecture, however, will be useful to a surveyor in any branch of practice; but I am now assuming that my address is made to surveyors, and that architects, strictly speaking, are without the limits of our Institution.

LIVERPOOL ARCHITECTURAL SOCIETY.

The second ordinary meeting of this Society was held at the Royal Institution, Colquitt-street, on the evening of the 16th inst., the president, Mr. Charles Aldridge, F.R.I.B.A., occupying the chair.

The prizes for drawings submitted at the various meetings of the Class of Construction and Design during the last session were awarded to the successful students: the first to George Hornblower, and the second prize to Richard Holt.

The paper for the evening, entitled 'Recent Notes from the Continent in Pen and Pencil," was then read by the author, Sir James A. Picton, J.P., F.S.A., and was illustrated by numerous sketches of features of interest at the various places visited by him.

A discussion followed, in which the president and Messrs. Joseph Boult, G. H. Moreton, and H B. Bare took part, and the meeting terminated with the usual vote of thanks to the author of the paper.

The Electric Light adopted for Hove.

The Town Commissioners of Hove, adjoining [illegible] Hove, it is stated, decided to illuminate [illegible] light, with as little delay as possible, the whole of the town, at an estimated cost of 2,000*l.* per annum. The system agreed upon is the Brush system. The present cost per year for the gas is about 1,900*l.*

ARCHITECTURE AND ARCHITECTS IN LEEDS.

The inaugural address to the Leeds Architectural Society was delivered on the 10th inst. by the President, Mr. J. B. Fraser, F.R.I.B.A. In the course of it the President said:—I should like to occupy your time for a very few minutes in calling attention to some of the more prominent of the new buildings in our immediate neighbourhood, or at least to such of them as have come under my observation; and, first of all, as being of perhaps the greatest public interest, let us glance at the School Board and Municipal Offices in Calverley-street. The School Board Offices are, as you know, complete and occupied, and the block containing the Municipal Offices, &c., is sufficiently far advanced to enable us to form some idea of its ultimate appearance, although until complete it will be unfair to pronounce any definite opinion. I think all will admit that Mr. Corson tackled with his usual ability a very difficult problem when he designed a block of public offices under the very shadow of one of the architectural gems of the country, our noble Town-hall, and where the breaking up for the different floors and rooms necessitated a treatment on such a totally different scale; he was, also, still further handicapped by having to divide his building (which was originally designed as one block) into two distinct structures. Whether he has overcome the difficulties presented with entire success will, of course, be a matter of opinion, but every one will acknowledge the great skill and care exercised in planning and working out the different details. The treatment of the arched ceiling in the public reading-room is novel and worthy of attention as an attempt to utilise the materials of fireproof construction in decoration. I anticipate that the arrangement of parti-coloured blocks in the soffits of the arches may give rise to some criticism. I would particularly draw your attention to the free use of terra cotta as a means of internal decoration, and the admirable manner in which it has been introduced into these buildings. The Athenæum buildings by Mr. Bakewell claim our attention as being a very bold and successful design, but I must take some exception to the weak effect produced by the exceedingly flat pointed arches and small piers between the shops of the ground-floor. The shop-keeper cries for plate-glass, which Mr. Corson alluded to in his address, is here especially noticeable. The large warehouse in Park-square, designed by Mr. Ambler for Messrs. Arthur & Co., has a striking principal front, as regards the combination of cutting or rubber bricks and dull red stone, and the treatment throughout is novel and bright. The carving, especially over the central entrance, is excellent, and there is a good sample of wrought-iron work in the area panels. Old-fashioned, sleepy-looking Park-square will soon be losing its time-honoured characteristics, and already presents in vivid contrast the quiet style of the first quarter of the century and the eclectic ideas of its last quarter. The block of shops at the corner of Somers-street and Park-lane, by Messrs. Smith & Tweedale, appears to me to be a very satisfactory example of street architecture, although with no features calling for special comment. By the same architects a good example of the treatment of brickwork may be seen in the Cap and Clothing Factory of Messrs. Brook & Co., in Grace-street. The additions to the Oriental Baths, Cookridge-street, will attract considerable attention, both on account of the public interest attaching to the building, and architecturally because of the attempt to transform into a nondescript modern Gothic front the well-designed Saracenic elevation of Mr. Brodrick; the result, as far as we can judge at present, can scarcely be considered a gain from an art point of view, and the change from the old familiar dome to the turret over the central block is, I think, by no means an improvement, and it is to be regretted that the architect was not allowed to design an entirely new front. Messrs. Adams & Kelly are to be congratulated on their exceptionally successful treatment in raising and enlarging St. Ann's Roman Catholic Schools. The building, though unimportant, is neat and pleasing, and the additional story has much improved it. Mr. W. Turton's new stables, off North-street, are valuable, as being the outcome of long practical experience in the ownership and care of horses. There is nothing specially novel in the plan: the stables are lofty and wide, and show clearly

that even in the midst of a crowded town it is not judged desirable to risk the horses' health by overcrowding. Glazed bricks are, of course, extensively used, and vitrified bricks for pavement. A bath for the horses, sunk down in one corner of the stable-yard, is worth making a note of. One cannot help being somewhat disappointed at the introduction of an old-fashioned stucco front into our principal business thoroughfare, and therefore I cannot think the Imperial Hotel altogether satisfactory as far as its external appearance is concerned; internally, I believe, the building is a success. While speaking of stucco it may be interesting to observe that some of our London brethren are commencing to use cement concrete cast in blocks, moulded and coloured to their designs, for external dressings, and also for internal features. This is quite a new departure, and the experiment will no doubt be watched with interest. Where stone is exceptionally costly, terra-cotta uncertain in the burning and twisting, and bricks hard and unsuitable for elaborate treatment, the use of concrete blocks in string-courses, cornices, and other features, would certainly appear to be of value to the architect, who is expected to produce effective and sound work with inexpensive materials. The shops by Mr. Bakewell, on the north side of the new approach to the joint station, while giving evidence of careful thought in design, and in the matter of safe and economical construction, are, I venture to think, of too plain a character for so important a situation, and it is open to question whether such extreme plainness is not a mistake from a financial as well as an artistic point of view, as there can be no doubt our shopkeepers are year by year adopting, and finding the advantage of well-designed and attractive-looking places of business. Glancing in passing at the Covered Market, I think we may compliment the Corporation on having gained an increase of rent-producing space by the addition of a gallery over the outside ground-floor shops. I think this addition somewhat of an improvement. I cannot but regret the waste of public money expended in the building of the market in Vicar's Croft, and am sorry to notice that the streets are not covered so as to protect the public from the weather. The Boroughh Coffee-house, by Mr. T. W. Baxandall, is a good, honest, substantial-looking building, and well suited to its purpose, and must certainly take rank amongst our street improvements. The Model Lodging-house, in Harpur-street, by Mr. D. Dodgson, is well planned, and it is interesting as a sign of the constantly-increasing demand for better provision for the bodily comfort and for the improvement of the mental and moral status of the poorer classes. The People's *Café*, just over Leeds Bridge, is another example of modern social requirements, and is a noteworthy and handsome addition to our public buildings, and very creditable to the architects, Messrs. Adams & Kelly. The addition to the *Leeds Express* Office is an example of the unsatisfactory effect of engrafting on a well-balanced and carefully-designed building, a wing by another hand, and in a totally different style. The Police Station at Crown Point-street, Hunslet, though unimportant as to size, deserves a passing note, as being one of the latest Corporation works, and as showing that ability and artistic taste can be occasionally found amongst our corporate officials. I must call in question the good taste of the extremely disproportionate coat of arms over the entrance. I suppose we ought and do feel proud of our ancient belongings; but in a building so practically associated with the failings and shortcomings of our frailer citizens, it might be more respectful to the shield of our forefathers to keep it in the background. Mr. Alf Cooke's new printing-works, Hunslet-road, by Mr. Ambler, are well arranged and amply lighted, and are, taken as a whole, an encouraging and satisfactory feature of architectural progress, and I would specially draw your attention to the use of terra-cotta for the external ornamentation, as being a pleasing example of the adaptation of this material. It has hitherto been too much the custom of our manufacturers and employers of labour generally to relegate the planning and erection of the workshops necessary for their business to a respectable and trustworthy builder, thereby saving considerably, as they imagine, in the matter of the architect's commission, &c. These hard-headed, money-making, and money-saving people are now apparently finding out that the long worked-for experience of the architect is worth paying for, from a purely economical point of view; but if a slight additional expenditure beyond that of the requirements of the bare walls and square-hole order of architecture is required, the ultimate result in the cheerfulness of his place of business, the better health of his *employés*, and the improved appearance of his native or adopted town must more than repay an ordinary thoughtful and liberal-minded man. It may, perhaps, not be out of place here to offer a word of congratulation to, and a hope for the further success of, Mr. Cooke, in his efforts to improve the class of work which he has taken up with such vigour, and which may be designated in general terms as art for the million. Messrs. Kitson's block of new offices, by Mr. Chorley, presents a business like and appropriate elevation, the most interesting feature being the carved brickwork, which has been freely used, and, I think, with very considerable success. We must regret the necessity of further additions to Holbeck Workhouse, especially as the expenditure touches all of us so nearly in one of the tenderest spots,—our pockets; but as the work has to be done, it could scarcely fall into better hands than Mr. Hill's, who is carrying it out. The buildings erected by the Leeds School Board at Headingley and Kirkstall, many of you will have observed, are being built externally entirely of stone. I do not, for my own part, think the change, from the admirable groups of brick and stone buildings designed by Messrs. Adams & Kelly, by any means an improvement. It is scarcely necessary to say that, as far as they go, the new schools, though very plain, are designed in good taste. In addition to the foregoing new schools, the Board have also carried out additional alterations to the Ellerby-lane, Jack-lane, Bewerley-street, and Stanningley Schools. The new work has been designed to harmonise with the existing buildings. I have been specially pleased with the satisfactory appearance of two pairs of semi-detached villas at Far Headingley, designed by Messrs. Smith & Tweedale. The colour of the brickwork is very rich, and the absence of any glaring contrasts in the way of white dressings enhances the thoroughly warm, home-like, and comfortable effect. The residence at Headingley, off Shaw-lane, by Mr. Hill, designed in the Domestic Gothic style, is a most successful effort, and shows how this class of work can be adopted for modern houses. The Wesleyan Methodist Chapel at Meanwood, also by Mr. Hill, is a simple picturesque example of Ecclesiastical Gothic architecture. An admirable specimen of Free Classic design in brickwork, and one in every way worthy of attention as showing what can be done by the aid of good cutting bricks, is exhibited in the Baptist School in Meanwood-road, designed by Messrs. Smith & Tweedale. The details are carefully wrought out, and all seems suited to the material used. The carving is, I think, if anything, too much undercut and of too florid a character, otherwise this little building is quite a success. The new laboratory at the Leeds Grammar School, designed by Mr. Chorley, in strict harmony with the previously existing building, has been carried out in a very complete and efficient manner.

DISTRICT SURVEYORS AND THEIR DUTIES.

At the meeting of the Metropolitan Board of Works on the 18th inst., reference was made to a point of considerable importance connected with the duties of District Surveyors

The Building Act Committee reported that they had considered the letter from the Vestry of Paddington, relative to the District Surveyor's professional connexion with certain buildings in course of erection at the rear of Nos. 397 and 399, Edgware-road. "The Vestry recently called the attention of the Board to these premises, stating that they abutted upon a roadway 25 ft. wide which had not been approved by the Board. As the entrance to this approach was enclosed, the Board requested the District Surveyor to inform them of any alteration which might enable them to take action in the matter. The Vestry now state that they have been informed that the services of the District Surveyor have been retained by the freeholder of the estate and the builder of the premises. The Vestry also express an opinion that if the works had been superintended by an independent surveyor, the existing difficulties might have been obviated. Mr. H. Gundry, the District Surveyor, has attended your committee, and stated that he was professionally engaged by the leaseholder of No. 399, and gave notice thereof to the Board, who appointed another district surveyor. Mr. Gundry admits that he was employed by the freeholder of the estate to let the property, and that no surveyor was appointed to supervise the works at No. 397. By thus acting for the freeholder, it appears to your committee that the District Surveyor also became virtually responsible for the works at No. 397, in respect of which no notice was given to the Board. Your committee are of opinion that, although the District Surveyor may not thereby have infringed the letter of the 37th section of the Building Act, such a practice is highly objectionable, and they recommend that they be authorised to further consider the case in connexion with the proposed amendment of the Building Act; and that the Vestry of Paddington and the District Surveyor be informed accordingly."

On the motion of Mr. J. E. Saunders, who, as chairman of the Committee, brought up the report, the recommendations were adopted.

ARCHITECTURAL ASSOCIATION.

The first ordinary general meeting of this Association for the session 1881-82 was held on Friday, the 11th inst., Mr. Aston Webb, president, in the chair. Sixty-two gentlemen were nominated members.*

The report and balance-sheet for the past year, together with the reports of the various classes, were, on the motion of Mr. Thomas Blashill (who congratulated the Association on the great increase in the number of its members and in the increased usefulness of its work), unanimously adopted.

The annual report reviews the work of the past session, and contains the following passages as to the work of the future:—

"Admission to the Associateship of the Royal Institute being now attainable only by passing an examination, the committee have thought it desirable to vary somewhat the arrangements of the classes, with a view to making them specially useful to members preparing for that examination. The meetings of the classes generally have been rearranged, an entirely new class for the study of Professional Practice has been started, and courses of lectures, dealing especially with Design and Construction, and connected with these classes, have been arranged to be given by Messrs. E. J. Tarrant and T. Blashill, which the committee believe will be of considerable advantage to the members generally, as well as to those about to present themselves for examination.

The thanks of the Association are due to the delegates, Messrs. J. D. Mathews and H. L. Florence, for their services in representing the Association on the committee appointed to prepare the scheme for the above examination."

The balance-sheet showed the total income of the year to be 665*l.*, including 416*l.*, received on account of members' subscriptions, and 62*l.* for entrance-fees. The total expenditure was 552*l.*, a balance of 112*l.* remaining in the treasurer's hands.

The reports of the classes detail a great amount of good work done.

The President said a letter had been received from the Chairman of the Working Men's Club and Institute Union asking the members of the Association who might have works in progress to conduct parties of workmen over the buildings on Saturday afternoons. The President commended the matter to the attention of the members, as he was convinced that it was a good thing to bring architects and workmen together.

The President then delivered his inaugural address, portions of which were given in our last (p 627, *ante*).

In the discussion which followed,

Mr. J. Douglass Mathews, after congratulating the President upon occupying the chair of the Association, expressed his conviction that the present was a very important era in the history of the Association. Probably one of the most important subjects touched upon in the President's address was that of Mr. Street's suggestion for the fusion in some way of the Institute and the Association. It was not very surprising, perhaps, considering the great success of the Association, that such a suggestion should be made, but he (Mr. Mathews) sincerely hoped and trusted that the Association would never for one moment entertain any question of fusion with the Institute. The question had been mooted before, and the offers made had been firmly refused, as he hoped such offers always would be. Although, if such fusion took

* The number of members whose names are given in the "Brown Book" for the present session is 863, of whom 691 are resident in London.

place, the members of the Association, might be left pretty much to govern themselves, they would feel that they had not that perfect freedom which was so essential to enable them to pursue their work. Although he thought they would all be opposed to such fusion, they had no differences with the Institute in any shape or way. Each body had its own work. The Association had shown that it had every desire to help the Institute, and the statistics which had been quoted by the President showed that there was no animosity between the two bodies. For the last few years he had had an opportunity of knowing pretty well the working of both societies, and he knew that one society could and did help the other constantly. The Institute had no need to be afraid of the Association; it need not think that, because the Association had increased, its own members would not increase. It was found in practice that the greater part of the members of the Association who followed the profession in earnest looked forward to the Institute as a kind of goal, and it was gratifyng to know that the members of the Association who joined the Institute did not forget the Association. The Association should be, and indeed was, a kind of nursery or feeder to supply the Institute. The Association had shown itself to be in earnest in helping the Institute, by taking up the examination scheme most thoroughly, with the view of making it a success, and he did not hesitate to say that it would be a success. He begged to move a vote of thanks to the President for his able address.

Mr. Blashill said the advice which the President had given as to a curriculum of study for young architects was most useful, and he hoped it would lead to something being done in the matter. With regard to the proposed fusion of the Association with the Institute, having very thoroughly considered the matter, he, like Mr. Mathews, should regret most sincerely if anything of the kind took place, although at the same time he claimed to be thoroughly loyal to the Institute. With all that had been said by Mr. Mathews on the subject he fully agreed. He ventured to say that the more the gentlemen who thought that good would arise from the proposed fusion made themselves acquainted with the actual position and method of working pursued by the Association, the more fully would they see the futility of their proposals. Of course it was a very plausible idea: everybody liked union, but in reality there was no disunion, and there never had been any discord between the Institute and the Association,—at least, not during the last twenty-one years. The work done by the Association during the last one-and-twenty years fully justified its determination to continue in its own course. The proposal for fusion was full of objection. The new examination scheme, he was convinced, was going to succeed, and its success would be largely due to the support which was given to the Institute by the Association.

Mr. E. C. Lee expressed the pleasure with which he had listened to the President's advice to young men entering the profession, and urged upon all such the desirability of drawing up and adhering to some systematic line of work and study.

Mr. Lacy W. Ridge said, with regard to the suggestion thrown out by the President of the Institute the other evening, he hoped the Association would retain its soul in perfect confidence. It was an amiable idea, likely to occur to a gentleman who, from the dignity of the chair upstairs, surveyed the whole of the profession for the first time. That suggestion would never come out of the room wherein it was started. The feeling of the Institute itself,—he might even say the feeling of the Council of the Institute,—would be strongly opposed even to the making of an offer for fusion with the Association, and therefore the members of the Association might dismiss the matter from their thoughts. The feeling of the Institute as a body, and especially of the members who were also members of the Association, was unanimous in saying that union with the Architectural Association was not to be thought of for one moment. It was not only true that the Association was a feeder to the Institute in the way of supplying it with members, but that it had done in the past and would do in the future a great deal in sending into its ranks architects who were thoroughly trained.

Mr. Gotch said that with regard to the question of curriculum, a great evil of the present system of architectural education was that so much of it was optional.

Mr. Stannus observed that he thought Mr. Street's suggestion had been scarcely understood by the gentlemen who had spoken. He hardly thought it should be characterised merely as an amiable suggestion, for Mr. Street had had a wide and clear outlook on architectural matters for many years past, and although he had only just taken the chair of the Institute, he was quite capable of offering a mature opinion on the subject. He thought that Mr. Street's idea was not so much that there should be an actual fusion of the two societies, as that they might combine with the Institute and other architectural societies for certain purposes, and send delegates to sit at the council-table for the consideration of specific matters.

Mr. Vacher suggested that it would be well to appoint a committee to draw up something like a complete curriculum, and also to frame, with the assistance of the honorary solicitor, a more perfect and satisfactory form of agreement than those at present in use in connexion with the "articling" of pupils.

Mr. S. Flint Clarkson said that the proposed scheme of fusion was so thoroughly considered and so unmistakably decided a few years ago, that nothing would be gained by the reconsideration of the subject at the present time, except that the undesirability of fusion would be demonstrated more clearly than ever.

The President having acknowledged the vote of thanks, the meeting terminated.

THE LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

The first meeting of this society for the present winter was held on Monday, the 14th inst., at No. 4, St. Martin's-place, Trafalgar-square.

Mr. Alfred White, F.S.A., presided, and gave a brief review of the work of the past session, in the course of which he incidentally referred to the discoveries made during the works now in progress at Leadenhall Market. He had no doubt that much remained to be discovered on the same site, and as the excavations were now reaching the Roman level, he trusted that Mr. Price, who was watching over the work, would soon have some additional important and interesting discoveries to report. It was very satisfactory to know that Mr. Price and a few other gentlemen had free access to the excavations just now taken in hand for the completion of the "Inner Circle Railway," which would traverse an extremely interesting part of Roman London. During the summer a number of members of the Society paid a visit to the excavations which had revealed the Roman villa at Brading, which, though far from Middlesex, possessed much interest for the members, owing to the presence of Roman remains in London. The excavations at Brading were under the direction of Mr. J. E. Price and Mr. Hilton Price, both of them members of the Society. The villa had attracted so much interest that as much as 60*l.* per week was received in shillings during the summer for admittance to see the remains. In that way he hoped that the public would contribute a considerable sum of money towards the expense of the excavations and the cost of roofing over and otherwise preserving the remains which were discovered. Theirs was not the only society which had taken an interest in these discoveries. The Society of Antiquaries had contributed funds towards carrying on the excavations, and another society, the Royal Institute of British Architects, had not only contributed money, but had printed in their "Transactions" a very valuable paper, illustrated with coloured representations of some of the pavements, while others were given in outline. The paper was one well worthy of the attention of archæologists, and everybody who subscribed 2*l.* 2*s.* to the excavation fund would be entitled to a copy of it, including the illustrations mentioned. Alluding to the losses of the year, Mr. White referred to the deaths of Dean Stanley, Lord Hatherley, and Mr. George Russell French, all of them members of the Society.

Mr. Edwin Nash, F.R.I.B.A., then read a brief paper entitled "Archæological Notes on Middlesex." At the outset he spoke of the confusion often caused in archæological discussions by people who used the words "antique" and "ancient" as convertible terms. The word "antique," as he understood it, was a special term significant of the art of Greece and Rome. The "Apollo Belvedere" and the Parthenon and its sculptures were "antiques" in the proper sense of the word, but it was incorrect to talk of furniture, belonging, say, to the Elizabethan period, or even of the architecture of the Egyptians, as "antique": they would be more properly characterised as "ancient." Then came the question how far back must the archæologist of the present day go in order to arrive at a period whose productions could justly be called "ancient"? Opinions differed on that point, but he was inclined to draw the line of demarcation between ancient and modern at the end of the sixteenth century. To be a good archæologist was no easy task, for it needed a rare combination of qualities. A great deal had been said of late years about restoration. Now the most important point in connexion with the restoration of a building was to make the preservation of the original character of it the main point, neither adding to nor taking from it a single detail. Of course, in cases where enlargement was demanded, the architect should have free play, so that the modern addition should have a character of its own. Proceeding then to the more immediate subject of his paper, Mr. Nash pointed out that, small as is the county of Middlesex, it contains a great many interesting remains, foremost amongst which are many specimens of Roman work, and such buildings as Westminster Abbey, the Temple Church, St. Bartholomew's Smithfield, and St. John's Chapel in the White Tower. With regard to St. Bartholomew's, Mr. Nash asked where were the church restorers? Had they all gone out of town? It would seem so, from the condition in which they suffered this church to remain. What a creditable and delightful thing it would be to see the remains of this church restored to their pristine condition! It was true that something was done some years ago, and it was good so far as it went, but it was very meagre in extent, after all. With regard to St. Giles's, Cripplegate, the whole of the interior had been well restored, and as there were funds available, he hoped to see the outside of this church, particularly the fine tower, judiciously restored. The tower was of the fourteenth century, although it contained some sixteenth-century insertions, and the top stage was missing. After noticing the churches of St. Mary Aldermary, St. Andrew Undershaft, and St. Mary, Hadley, Mr. Nash spoke of the necessity for watchfulness on the part of archæological societies in order to avert the evil influences which threatened the existence of ancient remains. Destructive agencies were always at work. He was not an advocate for letting any good work go to decay through neglect, but it might just as well be allowed to perish of neglect as to disappear by more immediately-effective destructive processes. However carefully they might guard the ancient remains which were still left them, modern necessities would inevitably remove some of them year by year, and he therefore thought it would be a very good thing if some simple dictionary, or rather catalogue, of ancient remains extant in the county, could be compiled. For instance, under the head "Crypt," which he would define as "an underground chamber, vaulted," he would enumerate and describe all the crypts known to exist in the country.

In the course of an interesting discussion which ensued,

Mr. J. G. Waller, F.S.A., on the subject of restoration, criticised the mode of procedure often adopted by church restorers in dealing with fragments of brasses. It was a common practice, with the view of preserving such fragments, to affix them to the wall of some part of the interior of the church, but, translated in this manner, unaccompanied by the slabs on which they were found, they were generally wholly unintelligible, although, before their removal, the *matrices* existing in the slabs furnished a clue to their interpretation as a whole. He thought that the proposed catalogue or dictionary of county antiquities would be of the utmost value, but he doubted whether its preparation was a work that could be undertaken by the Society.

Mr. S. W. Kershaw (Hon. Sec.) referred to the existence of wall paintings in old churches, instancing those in the chapter-house of Westminster Abbey, depicting the Apocalypse, as interesting specimens.

Mr. Barron, F.S.A., in illustration of the necessity for a catalogue of county antiquities, spoke of the continual demolition of the old overhanging timbered houses of London.

The Rev. Hawley Clutterbuck mentioned the recent discovery, in the church of St. Lawrence,

Reading, of a palimpsest brass. One side was found to be the brass of a benefactor of the Charterhouse, Sir Thomas Popham, he thought. It had probably been removed when the Charterhouse was given over, and, finding its way into the brass shop, had emerged with the other side engraved as the brass of a citizen of Reading. This brass had now been removed from the floor of the church at Reading where it was found, and hinged to the wall, so that both sides could be examined. Incidentally Mr. Clutterbuck mentioned that the parish church of St. James's, Clerkenwell (built early in the present century), was about to be "restored and beautified," and he trusted that advantage would be taken of the opportunity that would thus be offered to bring to the light of day some of the interesting ancient monuments at present preserved in the vault of the church, among them being that of the last prior of the Order of St. John of Jerusalem.

Mr. Blashill, in the course of a few observations, said that some such catalogue as was suggested by Mr. Nash for Middlesex was much wanted for every county. They would take time to prepare, of course, but many helpers could, he thought, be found. Such catalogues might be usefully supplemented by archæological maps to a large scale, coloured so as to show the period to which the remains existing in any part of the county belonged.

The Chairman brought the discussion to a close by tendering the thanks of the meeting to Mr. Nash for his interesting paper, and announced that the next meeting of the Society would be held on Monday, December 12, when Mr. Rivington will read a paper on the Stationers' Company.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

The first meeting of the session 1881–1882 was held on Wednesday last, the Rev. S. M. Mayhew in the chair. The discovery of a Roman villa, evidently of considerable extent, at Wingham, Kent, was announced. Aided by a grant from the Kent Society, the villa is being excavated by Mr. Dowker, and already three rooms with tesselated pavements have been uncovered, while a fourth has a hypocaust. The work is very fine, the walls in one room being lined with mosaics. Funds are much needed for the prosecution of the researches.

Mr. Loftus Brock also reported the efforts made by the Association with respect to the safety of Stonehenge since the meeting there last year, and read a letter from Sir E. Antrobus, the owner, who disclaimed all intention of "restoration" in the works undertaken there by him. These are but for the safety alike of the monument and the visitors. Nothing permanent will be done until the spring.

Mr. Way exhibited some Mediæval pottery from Southwark; the Rev. S. Maude a unique denarius of Gallienus, with the name of Germanicus on the reverse; and Mr. R. Soames a drawing of remarkable sculpture in Brixworth Church. It is called an eagle, and is supposed to have been brought from the Roman villa which existed close to the building, where it is now built into one of the walls. Mr. G. R. Wright, F.S.A., exhibited some drawings of Mulgrave Castle, Yorkshire, and described some of its curious windows.

The first paper was on the "Bourg elz Ziffar, Cairo," by Professor Hayter Lewis, F.S.A. This is one of the angle bastions of the wall of Cairo, now almost covered by sand. It has an octagonal central chamber, 26 ft. in diameter, formed of neatly-cut stone. It dates probably from the time of Saladin.

Mr. J. W. Grover, F.S.A., in the discussion which followed, alluded to the appearance of the pointed arch in a developed state here, and to the magnificent museum of Egyptian antiquities at Boulak.

The second paper was by Mr. Gordon M. Hills, and was on the "Measurements of Ptolemy applied to the Northern Part of Britain." He identified Hornsea Lake, east coast of Yorkshire, as Ptolemy's Portus Sinus, and Penrith as the starting-point of the tenth iter; Salava, the second station, he placed at Gallaber, near Trebay.

National Portrait Gallery.—This gallery has lately been enriched by the addition of several important portraits bequeathed by the late Lord Hatherley.

THE FORCE OF THE LATE GALE.

The opening meeting of the Meteorological Society for the present session was held on the 16th inst.; Mr. G. J. Symons, F.R.S., president, in the chair.

The evening was devoted to an account of the gale which passed across the British Isles Oct. 13th and 14th, 1881, which had been prepared by Mr. Symons, with the assistance and co-operation of Mr. C. Harding and other gentlemen. There is evidence of the storm being formed in the Atlantic about 150 miles south of Nova Scotia on Oct. 10th, and that at noon on the 13th there was a considerable disturbance about 600 miles west of Galway. At that time there were scarcely any instrumental indications in the British Isles of the coming storm. The curves of barometric fluctuation show very plainly the advance of the depression from west to east, for while at Valentia the minimum occurred at two a.m. on the 14th, on the east coast of Norfolk it is recorded that it did not occur till four p.m. This fall, coupled with others, seems to indicate an easterly progression of the barometric minimum at nearly forty miles per hour. The area over which injury was produced was very large, and although not without precedent, it was happily rare. The record of 56 lb. per square foot at the Royal Observatory, Greenwich, was the highest ever registered in that locality, and close by thirty-five trees were blown down in the park, and 15 ft. blown off the top of a spire which had been erected about forty years, the stone of which shows no sign of decay, and which had retained its position almost, if not wholly, by the gravitation of its mass. The general opinion seems to be that the structural damage over the greater part of the country was by no means unprecedented, and in the greater part of Ireland and the south-west of England was not even of an unusual character; but along the east coast, and in the east midlands, the damage was excessive, and on the north-east coast unprecedented. In Scotland the destruction of trees was enormous.

EXPERIMENTS WITH CLOSET TRAPS.

On Saturday, the 19th inst., and on Monday, the 21st, a series of public experiments were made on the premises of Messrs. Pullen & Son, Penton-place, Newington Butts, with the view of testing the comparative efficacy of improved forms of the ⊔-trap, Beard & Dent's round pipe ∩-trap, and Smeaton's "Eclipse" trap. Each of these traps was placed in turn beneath one of "Underhay's pattern" valve-closets, made by Messrs. Bolding & Son, of South Molton-street, and was tested, firstly, for resistance to "unsealing" by what Mr. P. J. Davies (who assisted Messrs. Pullen in the conduct of the experiments) called "momentum," and, secondly, for its power to withstand syphonage due to a vacuum. All the traps tested were 4 in. size. Mr. Pullen, Mr. Davies, and others, maintain that a round-pipe trap, where used beneath a valve-closet, is extremely liable to become "unsealed," owing to the momentum of the water rushing through the valve, when the latter is suddenly opened, being so great that so much water is carried out of the trap that sufficient does not remain behind to "seal" it, the momentum with which the water passes into the trap being aided in effecting this undesired result by the facility which the round-pipe trap possesses of being rapidly cleared,—in itself a good quality, inasmuch as it ensures greater cleanliness than is possible with the ⊔-trap, although Messrs. Pullen & Davies claim that the improved form of the ⊔-trap is quite as clean in use as the round-pipe ∩ or ℧ trap. We do not think they can succeed in establishing this part of their contention; but their failure to do so will not prevent the use of the ⊔-trap in positions where it can be proved that the round-pipe trap is likely to prove less reliable than one of the ⊔ form. The experiments which we witnessed went to show that under the condition as to water-supply hereafter stated, Beard & Dent's round-pipe trap and Smeaton's "Eclipse" are neither of them proof against being unsealed in the manner indicated by the momentum of the rush of water from a valve-closet when the valve is suddenly lifted. The ⊔-traps shown in action seemed, however, to be proof against being unsealed in the same way. It should here be observed, though, that the water-supply was not laid on in the ordinary way to the closet used for the tests, the water being conveyed into the basin by a piece of rubber tubing as required. Had the water supply been connected with the closet so that, simultaneously with the opening of the valve of the latter, water could have been admitted into the basin, the test would have been more conclusive, for some of the fresh water admitted into the basin would pass through the valve before the latter was closed, and so help to preserve the seal of the trap. All the traps named were afterwards subjected to tests to resist being unsealed by "syphonage." The tests were as follow:—Each of the traps was placed in its turn beneath the valve-closet before named, the out-go being connected by an arm 4 in. diameter and about 18 in. long, running horizontally from the trap to the vertical soil-pipe, which was also 4 in. in diameter. At 20 ft. above the point of this junction was another arm leading from a ℧-trap on which was fixed a Sharp's hopper closet. In this hopper the water to the extent of about a pailful was retained by a plunger until discharged. With a cap over the head of the vertical soil-pipe, and with the valve of the closet held open, the vacuum caused in the arm connecting the valve-closet with the soil-pipe by the rapid passage of the water downwards past the junction was sufficient to unseal Beard & Dent's trap, and Smeaton's also, the ⊔-trap alone remaining sealed. The same tests made without the cap on the head of the soil-pipe, and with the valve of the closet closed, had the same results, with the exception that Beard & Dent's and Smeaton's traps did not lose so much water as under the previous conditions. All the foregoing tests were made with all the traps unventilated. In a subsequent test, the round-pipe or ∩-trap was provided with a 2-in. ventilating-pipe between the water in the trap and the junction of the arm with the down soil-pipe, but charges of water passing down the latter under the same conditions as before did not disturb the water in the trap,—proving that where an ∩-trap is used, it needs to be sufficiently ventilated. The tests were made with appliances fitted up for the purpose in connexion with a lofty scaffolding. A large number of persons interested in the matter were present on Saturday, but there was by no means unanimity of opinion as to the results obtained. We may add that the appliances and the scaffolding which supports them will remain up some days longer, and Messrs. Pullen invite inspection of the same by architects, builders, plumbers, and others interested in the question.

"MODERN EASTBOURNE."

In the notes descriptive of the progress of Eastbourne, lately given (p. 601, *ante*), the sum named as the cost of Mr. Shone's sewerage works there should have been called 4,000*l.*; the sum named by the writer,—16,000*l.*,—represents about the total cost of the town's drainage, irrespective of the cost of Shone's ejectors. An "Inhabitant of Eastbourne," proud of its progress, thinks we might have given even a fuller and more complete account than we did. No doubt of it; and still have left unsung some of the beauties and conveniences of this flourishing watering-place. Of course; but this is not intended. All that is proposed in such notices is to give a general idea of what is going on in the places mentioned. As to the washing away of more than 200 yards of the new sea-wall during the late gale, "concerning which the ratepayers are very sore," this occurred after our commissioner's visit. Our present correspondent says:—"All Saints, a stone church at the back of the Grand Hotel, is one of the handsomest churches, but it is built on lower ground than its surroundings, and so does not appear to advantage. Another church is talked of in the stead of the chapel-of-ease to St. Saviour's, which is near or on the site of the new town-hall. On the Marsh a large church, All Souls, is in course of erection, built of red and white brick, to seat 800 or 900; the architects are Messrs. Parr & Strong, and the builder is Mr. Peerless, who also is contractor for the Cavendish. The church stands in a very populous neighbourhood, and is the gift of Lady Victoria Wellesley, who intends to spend 20,000*l.* on it and its endowment. St. Saviour's, without the tower, is the gift of Mr. Whelpton, the father of the present incumbent; the tower was added by subscriptions and offertories. There have been several large gifts towards All Saints. Altogether the private

liberality towards church-building in Eastbourne has been unusually munificent. The Bishop of Chichester spoke of it the other day. Christ Church has just had aisle and apse added; and there is a new Mission-room at Norway, an outlying district. Trinity Church has been much improved by the green fence being cut down, so that the church as now seen forms quite a picturesque object in the Seaside-road. There is also a Workmen's Hall provided by the liberality of Mr. Leaf, containing a large room, and tea, coffee, and reading rooms, in the Seaside-road; and, further on, just before Christ Church, is a coffee-palace; there are also two coffee-stalls. There are several handsomely-built chapels, and also a Protestant service in French once a week. The principal shops are in the Terminus-road, and the place possesses the doubtful advantage of shops built by threes and fours in among the other houses; whereas a whole street or row of shops would have formed an attractive lounge for visitors, as the King's-road at Brighton. In Eastbourne there is not one shop facing the sea. The place is insufficiently lighted at night, so many trees make it difficult to diffuse the light; but what there is is not good, and the darkness is more than visible,—it may be felt."

SEVEN DIALS.

A NEW Mission-house for the Seven Dials District of St. Giles's parish has been erected in Short's-gardens, in connexion with the London Diocesan Home Mission. The work in this place (which has existed for more than twenty years) has been hitherto carried on in a small and incommodious room divided from the street by a bakehouse attached to a baker's shop adjoining, and which was very unhealthy through defective drainage, badly lighted, and much out of repair. This has been all cleared away, with the exception of the side and back walls, and the new building now extends the whole length of the site, being about 80 ft., and has a frontage to the street of simple First Pointed character in stock bricks, the arches and jambs being of red brick and Bath stone. The design consists of a main gable finishing the end of the open-timbered roof to a bell-gable at the side. The building is well lighted from the roof by dormers between the principals. The drainage has been entirely reconstructed, and the premises have been made healthy. The opening took place on Tuesday, the 1st inst. (All Saints' Day). The architect was Mr. William Milford Teulon, of Upper Woburn-place; and the builder, Mr. Andrew Killby, of Appold-street, Finsbury, who has done his work well.

SCHOOL BOARD SCHOOLS IN THE METROPOLIS.

AT a recent meeting of the School Board for London, a report was brought up from the Works Committee, and ultimately adopted, containing the following recommendations:—

"The Committee have invited tenders for the erection of a school to provide accommodation for 1,200 children on the site in Homerton-row (Hackney). The Committee recommend that, so soon as the plans shall have been approved by the Education Department, the lowest tender, that of Mr. C. Wall, of Lots-road, Chelsea, amounting to 11,400*l.*, be accepted. Cost per head of school buildings only, 7*l.* 6s. 9d.; total cost per head, 9*l.* 10s.

The Committee have also invited tenders for the erection of a school to provide accommodation for 1,000 children on the site in Heberroad, Dulwich. The Committee recommend that, so soon as the plans shall have been approved by the Education Department, the lowest tender, that of Mr. W. Tongue, of Plumstead, amounting to 10,619*l.*, be accepted. Cost per head of school buildings only, 8*l.* 13s. 5d.; total cost per head, 10*l.* 12s. 4d.

On the 15th of August last, the Education Department sanctioned the provision of 400 additional places on the site in Bath-street, City-road. As the school which was then being erected on this site was nearly completed, and as Messrs. Wall, Brothers, the contractors, were willing, while their plant was on the site, to carry out the enlargement on the contract schedule of prices, the committee instructed them to proceed with the work. They recommend that the action taken by them be confirmed; and that the tender of Messrs. Wall, Bros., based on the contract schedule of prices, and amounting to 4,390*l.*, be accepted. Cost per head of school buildings only, 10*l.* 12s. 1d.; total cost per head, 10*l.* 19s. 6d.

HOW TO BUILD.

(FROM A JERRY BUILDER'S POINT OF VIEW.)

Rules and Regulations for the Prevention of Rheumatism, Fever, Cold, &c.

First buy your ground; to be, of course, the cheapest lot you've seen:
For choice, an ancient brickfield, or where once the ground has been
Dug out for sand or gravel, with the holes all newly fill'd
With rubbish from the dust-heap, such as cats, untimely kill'd
Old bottles, cabbage-stalks, and tins,—to name them all is hard,
Though you'll find the chief components in the dust-bin in the yard.
Now, ere proceeding farther, it is best to first procure
A copy of the by-laws for the district; then be sure
To spend each leisure moment trying how to circumvent,
Within the law, if possible, their very plain intent.
Next excavate, put concrete in,—here 1 to 12 will do;
Then start your footings, *any* bricks! they're not exposed to view.
For mortar, take a little lime, some sand, some ash, much earth;
Be sure, when mix'd together, of the latter you've no dearth.
For damp-proof, lay a course in tar, and, just to save a brick,
Plug up all holes with concrete in the inside work, but pick
Your best bricks for the facings; you may halve the headers, too,
Have a straight joint up the centre, with, now and then, "a tumble."
Get first-floor joists on in a week to hold the walls together,
Get slated in in three to keep the *st*r*e*n*g*th from the weather.
The doors make thin, two from a deal's the plan you understand,
The only season'd work to be that purchased second-hand.
You'll connect the drains, of course, at the end next house, and thence
Run them a few feet underground and leave, to save expense:
You'd fix your cistern where you choose, and take the utmost care
That afterwards it can't be reach'd for cleansing or repair.
You'll let the same supply the bath, the closet,—all the last,—
Take waste and soil pipe down in one to where the drains are not.
But finish your fronts with care, with stone dressings, bays, and strings;
Inside with showy paper, deep cornice, and such like things.
And mortgage it floor by floor after the manner of old,
And put up a bill when finish'd, "House to be let or sold."
Then when you've secured a victim,—a tenant he's call'd by you,—
You'll migrate with a peaceful heart to "fresh fields and pastures new."

G. H. L. S.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,840. J. B. Spence, London, and E. Ormerod, Belvedere. Manufacture of concrete for receiving an enamelled surface. Nov. 4, 1881.

4,845. J. H. Johnson, London. Apparatus for flushing water-closets and urinals, &c. (Com. by T. Guinier, Paris.) Nov. 4, 1881.

4,848. H. Gibbons and A. Anthony, Hungerford. Locks and latches. Nov. 5, 1881.

4,859. J. Adams, Sheepbridge, and J. Bonehill, Rotherham. Fire-grates, &c. Nov. 7, 1881.

4,862. J. Harley, Glasgow. Astragals and sash-bars for glass, &c. Nov. 7, 1881.

4,876. W. Teague, Illogan. Ventilating and clearing places of gas, smoke, foul air, &c. Nov. 8, 1881.

4,878. J. P. Bayly, Paddington. Appliance to render structures proof against strain. Nov. 8, 1881.

4,893. R. H. Clive, Birmingham. Locks and latches. Nov. 8, 1881.

4,902. J. F. Smith, Leicester. Constructing bridges, &c. Nov. 9, 1881.

4,927. E. de Pass, London. Manufacturing artificial stone. (Com. by R. H. Stone, Brighton, Victoria.) Nov. 10, 1881.

4,928. J. Thompson and C. Morris, Birmingham. Stoves for heating, &c. Nov. 10, 1881.

4,929. H. J. Haddan, Kensington. Stoves. (Com. by J. Schneur, Paris.) Nov. 10, 1881.

4,937. F. R. Baker, Birmingham. Spring hinges and door-springs. Nov. 10, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

Nov. 8, 1881.

2,935. J. Louis, London. Supporting and protecting persons outside buildings for window cleaning, &c. July 5, 1881.

2,969. E. Aldous, Peckham. Apparatus for ventilating buildings. July 7, 1881.

3,067. J. Gilmore, Norwood, and W. R. Clark, Peckham. Apparatus for inducing an outward draught from chimneys, &c. July 13, 1881.

Nov. 11, 1881.

2,898. F. Grinnell, Providence, U.S.A. Apparatus for extinguishing fires in buildings, &c. July 2, 1881.

2,945. F. D. Harding, Hampstead. Applying decorations to door and other panels. July 5, 1881.

3,055. C. M. Scott, Dalkey. Disinfecting apparatus. July 12, 1881.

4,191. G. J. Cox, Maidstone. Gas cooking and heating stoves. Sept. 29, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending November 12, 1881.

1,327. T. Morgan, Westminster. Magazine heating-stove, with flues for circulation of air and ventilation.

This is a vertical stove in which the fire is carried in an internal cylinder, and the air passes between the internal cylinder and the outer cover, through flues in which it is heated. (Com. by O. Elterich, Nuremberg, Bavaria.) March 24, 1881. Price 6d.

1,432. W. Morgan, Bristol. Deodorising water-closets.

A pipe is led from the upper part of the pan of the closet to the eaves of the house in which a gas-burner or oil-lamp is placed, which creates a draught and draws off all the effluvia through the pipe. April 1, 1881. Price 6d.

1,449. A. MacPhail, London. Firegrates, stoves, &c.

The grate has a corrugated bottom and backing of fire-clay, and behind and above the grate is a space, through the front wall of which are a number of holes. The lower end of this space opens into the flue. The front bars of the grate are vertical, and curved over towards the fire, and a screen is placed against the bottom bar, on which the vertical bars rest with holes, so that, when the fire is lighted, the air passing through these holes drives the gases and smoke through the holes in the wall into the space behind, where they are consumed. April 2, 1881. Price 6d.

1,466. J. Sainty, Wisbech. Apparatus for lighting fires.

A blowing apparatus, containing bellows worked by a lever, forces air into a wind chest from which a flexible pipe conveys the wind to a lamp. This consists of a number of flat wicks, so placed that when they are lighted the wind propels forward a horizontal sheet of flame. The grate need, therefore, only be filled with coal, no wood, &c., being required. (*Pro. Pro.*) April 4, 1881. Price 2d.

1,473. G. B. Jerram, Walthamstow. Pipes and syphon-boxes, or traps for drains, &c.

The sockets and spigots of the pipes are tapered, the space between being filled with soft material. The syphon-boxes are made with a loose cross partition, which forms the seal. This is made to slide up and down as required, and may be altogether removed for cleaning purposes. April 5, 1881. Price 6d.

1,475. W. H. Dandy, Great Driffield. Dwarf window-blinds or screens.

These are made of a number of vertical laths ranged side by side, which are ornamented or cut as required. They are secured to narrow strips of wood placed at the top and bottom. April 5, 1881. Price 4d.

1,484. C. Haarburger, London. Expanding fire screen.

This is composed of a number of strips of metal or wood, &c., which are laid diagonally over each other, and articulated together so as to be capable of expansion. A curtain or backing of cloth may be used to prevent the heat passing through the interstices. (*Pro. Pro.*) April 5, 1881. Price 2d.

1,485. G. Tall & J. Daddy, Kingston-upon-Hull. Compound for preventing escape of steam, gas, water, or air, from joints of pipes, &c.

This is composed of ordinary brickyard clay, 12 lb.; linseed oil, 2 lb.; black-lead, 2 lb.; pipeclay, 3 lb.; and whitening, 2 lb. These ingredients are mixed and ground together, and sufficient water is added to make a paste, which keeps the joints perfectly tight. April 5, 1881. Price 2d.

1,520. R. Applegarth, London. Decorating bricks, tiles, &c., by the use of mica.

Enamel, dissolved in water, is spread upon the surface. Upon this is a second coating of gummed water, and powdered mica is then sprinkled through a sieve upon this. The decorated article is then placed in a muffle, and baked. (Com. by E. A. L'heureux, Paris.) (*Pro. Pro.*) April 7, 1881. Price 2d.

1,528. W. T. Sugg, Westminster. Uniting gas, water, and other pipes or tubes.

The ends of the pipes to be joined are gripped between

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

an internal ring of soft metal and two external rings or socke s with a flange, through which bolts are passed to secure them together. (*Pro. Pro.*) April 7, 1881. Price 2d.

1,545. J. C. Mewburn, London. Apparatus for moistening, cooling, and purifying air.

Water is held in a horizontal pipe, in the upper part of which are a number of atomising cocks. Compressed air or steam enters the pipe, and forces out the water in an atomised state, which cools and purifies the air. (Com. by A. J. Desmarest, P. Cosnard, E. Sée, and F. Sée, Lille, France) (*Pro. Pro.*) April 8, 1881. Price 2d.

1,561. W. Lawley and J. Lawley, West Bromwich. Metallic road gutters.

To render road gutters capable of being cleansed easily, the trough-shaped body is fitted with a hinged covering plate, which can be turned back, exposing the whole width of the gutter, and rendering the operation of cleaning easy of accomplishment. (*Pro. Pro.*) April 9, 1881. Price 2d.

3,388. C. Detrick, Philadelphia, U.S.A. Continuous underground pipes.

These are formed by excavating the ground to the required size and then forming within, upon cores of the desired shape, a mass of plastic material that will subsequently solidify, and when the cores are removed will form a pipe, after which the excavated substance may be replaced in the trench. August 4, 1881. Price 8d.

VINEGAR MANUFACTORY, BREWERY-ROAD.

Large new premises are fast approaching completion in the Brewery-road, Caledonian-road, for Messrs. Crosse & Blackwell, of Soho-square, to be devoted to the extension of their present vinegar manufactory, which they face in the same road. A building lease having been granted by the Corporation, substantial premises covering an area of 20,000 superficial feet, inclusive of the yard, have been erected, consisting of two tun-rooms, each of which is 88 ft. by 50 ft., with a cooperage, loading-stage, and warehouse over on the one side of the yard, and a foreman's residence, with stables and a van-shed, &c., on the other side.

The building is faced with red pressed bricks from the Adderley Park Brick Company, with Portland Stone bands and dressings, the spandrels of arches being filled in with ornamental bricks from the same company.

The tower, which is 75 ft. in height, is the chief object of importance, and contains the staircase to warehouses, with cloak-rooms and lavatories on each alternate landing.

A subway will be formed, permission having been accorded by the parish authorities, under the roadway, through which it is contemplated to carry steam, water, or gas-pipes, as also to supply a means of communication between these premises.

The architects are Messrs. Roumieu & Aitchison, of Lancaster-place, Strand; and the contractors, Messrs. David King & Son, of Billiter-avenue.

BUILDERS' BENEVOLENT INSTITUTION.

The fifty-sixth election of pensioners in connexion with this Institution was held on Thursday at Willis's Rooms, St. James's, the President, Mr. Ex-Sheriff Burt, J.P., in the chair. There were six candidates,—five men and one woman. It was originally intended to elect only two men and one woman, but in consequence of the large amount subscribed in connexion with the recent anniversary festival,—the success of which was due, in no small degree, to the zeal of the Secretary, Major Brutton,—it was determined by the committee to elect three men. The candidates were:—John Willis, aged 65 (second application), who received 2,307 votes; Charles Henry Wood, aged 63 (second application), 1,819 votes; John Loat, aged 84, 1,412 votes; Jonathan Parsons, aged 67, 432 votes; John Cooper, aged 78, 625 votes; and Amelia Stone, aged 60, widow of William Stone (second application), 2,897 votes. Shortly after the close of the poll at three o'clock, the scrutineers (Messrs. Thomas Stirling and T. F. Rider) reported the results of the voting as above given, and accordingly the Chairman declared the successful candidates to be John Willis, Charles Henry Wood, John Loat, and Mrs. Stone. Votes of thanks to the chairman and scrutineers brought the proceedings to a close.

The Number of Failures in England and Wales gazetted during the week ending Saturday, November 19th, was 229. The number in the corresponding week of last year was 250, showing a decrease of 21, being a total decrease, in 1881, to date, of 859.—*Kemp's Mercantile Gazette.*

TEWKESBURY ABBEY.

Sir,—I am glad attention is being called to this restoration, and hope you will use your influence to stop money being spent on the interior till the exterior is put in fair repair.

The north arcade to the clearstory should be dealt with first. Surely no society would object to the removal of this wretched modern work.

The turrets at the west end are the most beautiful I have ever seen, and I confess I should like to see the west window out, and, if there is any evidence, the part restored that is deficient. Where slate roofs form the clearstory at present, this looks weak, and spoils the effect of the beautiful west end.

Who is responsible for the horrible black brick paving round the abbey, that seems suitable for some cheap local Board, but is unworthy such a building?

I was surprised to hear there was no clerk of works employed, the only *man* mason I saw there telling me it was left to his master.

A number of youths were working mouldings far beyond their skill, and a comparison of the sections of the new work with the old showed the want of careful supervision.

On the nave clearstory a youth was whistling a tune and rubbing a piece of card wire at random over a moulding, altering its profile entirely. I looked round for a brick, and if I had found one at the moment I fear I should have been made acquainted with the interior of a very different building.

Large sums have been spent on the building, and it is unfair to the architect, his time being taken up so much with committees, to leave the work without supervision.

If it is want of funds, I feel sure that the class to which I belong would subscribe towards the salary of a competent man experienced in Gothic masonry, the bedding and jointing of stones and their selection, and who by his reading and observation would make the construction rather than the history of the place his study.

I regret that too many of my brethren neglect the construction, and though talking glibly of the abbots, can tell me nothing of the tooling or jointing of the different periods.

A Clerk of Works.

CONTRACTS AND QUANTITIES.

Sir,—Being lowest for a tavern to be erected at Fulham this week, under a firm of architects well known, who supplied their own quantities, I found the contract terms were to include the following:—

"The quantities were to be taken as correct, opportunity being given to the contractor to verify them before signing." "In case of any dispute between employer and contractor, the architect's decision to be final, binding, and without appeal."

On seeing this, I applied for opportunity to verify the quantities, which was refused, as the client (who was present) insisted on the matter being settled at once. As the architect refused to incorporate the quantities with the contract, I refused to sign, and the matter accordingly fell to the ground, as far as I was concerned.

I want to know, sir, whether this form of contract is legal, as I am informed it is not, and can be upset in law. It seems to me inconceivable that a man who insists on being paid 2½ per cent. for the quantities he supplies should not be responsible for their accuracy.

Young Builder.

Sir,—From time to time I have observed advertisements emanating from H M. Office of Works, inviting builders to tender, in which the following paragraph invariably appears:—"The Commissioners do not hold themselves responsible for the accuracy of the bills of quantities, which must be verified by the persons desirous of tendering."

It is a marvel that builders can be found willing to tender upon such objectionable terms as these. In the first place, a builder desirous of tendering has no option but to take the quantities supplied to him by the Commissioners, and in the absence of the name of the quantity surveyor there is nothing to indicate that the quantities have been prepared by an experienced person; in fact, one might very fairly infer from the disclaimer of responsibility on the part of the Commissioners that such an eventuality as the quantities being found inaccurate had presented itself to their minds.

I am not aware whether these quantities are prepared by a salaried surveying clerk in the Office of Works, or by an outside quantity surveyor, charging his commission in the usual manner. If the former, the Commissioners are acting in a high-handed manner and a spirit of unfairness, by binding down the builders to accept as correct the quantities prepared by their own clerk, which, in the event, may turn out to be inaccurate. If the latter, there is no occasion to disclaim responsibility where none exists, as, in the event of inaccuracies in the quantities, the builder has his remedy against the surveyor whom he pays.

I have assumed that inaccuracy means "short quantities"; cases of "full quantities" seldom or never arise. But the worst point in the advertisement is the compulsory verification of the quantities. If this is to be honestly done, it is tantamount to retaking-out the quantities, the expense of which must, of course, be borne by the builders, and I should like to know, supposing builders could be found willing to incur this expense, whether the Commissioners would allow the time and afford the facilities necessary for such an operation to be performed? If not, it is a farce to talk about verifying quantities, and as the Commissioners must know that, in fact, it is not and cannot be done, they in effect obtain tenders in the usual way, but with a reservation very much in their favour, and against the builders.

Of course, as long as there are builders who are willing to be bound hand and foot to quantities they know nothing of, so long will this class of advertisement continue to be put forth; but it rests with the builders themselves, by declining to tender upon such arbitrary terms, to effect the withdrawal of this kind of invitation to tender.

Sidney Young.

CONVICT LABOUR.

Sir,—Referring to the *Builder* of the 5th inst., I was much interested in your article on "Convict Labour as applied to the Drainage and Reclamation of the Irish Bogs." It appears to me that the influence of your journal might be made the means of agitating for a Parliamentary inquiry as to the practicability of the measure, and if possible in the ensuing session.

It is probable that the question of the maintenance of military surveillance of extra strength during the present disaffected state of the country, and the possible connivance of the convicts in any alarm of outbreak, might have some weight attached to it. Otherwise, as you observe, the *pros* of the question will outweigh the *cons*. If the movement resulted in a revival of the peat fuel manufacture, as it doubtless would, this should also be a source of profit to the Government, though as a commercial undertaking it is usually profitless, owing probably to the amount of labour required in draining, cutting, stacking, wheeling, and generally manipulating the peat. The accomplishment of this is part of the scheme, and the wholesale shipment of the peat fuel to London would materially abate the smoke nuisance of the metropolis, and more or less bring the "coal ring" to sense.

P. A. Williams.

BIRKENHEAD TOWN-HALL COMPETITION.

Sir,—Permit me to call your attention, and that of the referee (Mr. Barry), to a feature of the above which I fear has not received the attention it deserves.

You are doubtless aware that the first competition is for sketches only, five of which are to be selected and finally worked out by their authors, Clause 5 of the Instructions saying,—"In order to obviate the possibility of the sketch designs lodged in the preliminary competition being made use of by the competitors invited to take part in the final competition, such sketch designs will not be allowed to be seen by any one except the council and referee, and will be retained until the final competitive designs have been sent in."

This seems very fair, but it assumes a very different aspect when the fact is considered that the said council contains two architects and the father of a third who will likely be competitors, and yet have every opportunity of seeing the sketches and making such use of the information, as they may see fit. Surely, Mr. Editor, the council should not permit these gentlemen to see the sketches.

C.

COSTLESS POWER.

Sir,—Most cities are supplied with water by gravitation; and here, it appears to me, is a source of power which is wasted, and which might be taken advantage of in the production of the electric light. In such cases as those of Edinburgh and Glasgow, where the supply is derived from a great elevation, the pressure must be considerable, and that power might be made available without detriment to the water-supply of these cities. I am not prepared to go into details, but must confine myself with throwing out a hint which may be taken advantage of by those who possess more practical knowledge of such matters than I can boast of.

Signet.

The Fire in Essex-road, Islington.—Messrs. Jeffrey & Co., paperstainers, write to say that the fire which occurred on their premises on Monday morning was confined to a portion of their factory, and that most of their blocks and stock was saved. They have made arrangements to carry on their business as usual.

SCOTCH NEWS.

Montrose.—The old houses on the north side of the new street leading to the North British Railway Station have been removed. Ever since the street has been opened these rickety old buildings have been a perfect eyesore, and their removal will greatly improve the appearance of the street. The ground on which they stand belongs to the railway company; but it is understood that an offer has been made for it for feuing purposes by the North of Scotland Bank.——At a recent meeting of the Police Commission, the Provost presented a report made by Mr. Aitkenhead, architect, on the baths proposed to be erected in Bridge-road. As to the cost of the structure, Mr. Aitkenhead says,—"A very plain but substantial building, consisting of a model first-class pond, with thirty dressing-boxes and gallery, say five or six well-appointed private baths, three shower, one douche, one spray, and one vapour bath, large lavatory, water-closets, towel-boxes, entrance-hall, ticket-office, waiting-room, master's house of three apartments, enclosing walls, gateways, foot-pavement, as also a wash-house, boiler-house, with stalk, say 50 ft. high, engine-room, and coal-shed, and, inclusive of all engineering work and other necessary fittings, will, I consider, cost about 2,450*l.* I deem it also advisable to suggest, considering the conspicuous and isolated nature of the site, the building on which will be exposed to view on all sides, and situated as it is on one side of the principal entrances to the town, that a further sum of say 200*l.* be expended by way of moderately embellishing the external appearance." The report was referred to the committee for consideration.

Dundee.—The *Railway News*, noticing Mr. Barlow's plans for the new Tay Bridge, says:—The new bridge substantially agrees with that designed by Sir Thomas Bouch, though with several well-marked differences. Foremost amongst the latter must be named the provision for a double line of rails, by which a wider base is secured, and the strength of the structure to resist lateral pressure is proportionally increased. Another special feature is the use of wrought-iron throughout for the piers on which the girders rest, and as the substructure is 3 ft. higher, and the maximum height 11 ft. less, the highest of the central piers, besides being doubled in lateral strength by the provision for two lines of rails, will be individually about 14 ft. shorter than those which fell. As the greatest height is only continued over four of the principal spans, a better gradient towards the Dundee side is secured, a fall of 1 in 114 being begun at the fifth 245 ft. span, so that the extreme north pier of the largest spans will be considerably shorter than the corresponding pier in the former bridge. On the Dundee shore portion of the new bridge brick piers will be used, and in many points of detail, such as the form and arrangement of the iron pillars, the design differs from the bridge now so far existing. The works on the existing bridge will not be utilised further than that the piers standing in the water may prove useful as so many solid *points d'appui* from which the work of erecting the new bridge can be carried on.

Books.

The Science of Building: an Elementary Treatise on the Principles of Construction. By E. Wyndham Tarn, M.A., Architect. Second Edition. London: Crosby Lockwood & Co. 1882.

Practical Geometry for the Architect, Engineer, Surveyor, and Mechanic. Second Edition. Same author. Same publishers.

The appearance of new editions of these volumes serves to justify the high commendations they have already received at our hands. To the "Science of Building" considerable and valuable additions have been made, and all who are preparing themselves for the forthcoming examinations, as well as those who look forward to do so, will find it necessary to possess themselves of it. It is, of course, necessary that the student should be acquainted with geometry and algebra.

The second edition of the volume on "Practical Geometry" has been increased by the addition of short chapters on the method of applying geometry to the determination of strains in framework, and on isometrical projection.

VARIORUM.

The name of Treloar is so often mentioned in connexion with Ludgate-hill, that one is not surprised to receive a little book titled "Ludgate-hill: Past and Present," with that gentleman's name at the foot of the preface. It is a pretty little book, with a number of appropriate illustrations, and is published by Griffith & Farran, of that neighbourhood. A large amount of interesting matter concerning the world-famous spot of which it treats has been brought together in a clear and pleasant manner, and when once the book is opened it is difficult to put it down again. One is never tired of reading about wonderful London, even though we may have heard parts of the story again and again.——"Professional Papers on Indian Engineering," published at the Thomason College Press, Roorkee, reach us as usual. These are edited by Major A. M. Brandreth, R.E., Principal. The number before us (xli., July, 1881) consists of eight papers treating wholly of water-works and water-supply. It is mentioned incidentally, while speaking of glazed stoneware pipes from Lambeth as being imperishable, that the life of iron pipes in Indian soil impregnated with saltpetre does not extend over twenty-five years.

Miscellanea.

Tunnelling the Pyrenees.—The Paris correspondent of a contemporary says:—To the various subalpine and submarine tunnels now in course of construction, or planned only on paper, is to be added another enterprise of the greatest importance to France and Spain. This is no other than a scheme for piercing a tunnel under the Pyrenees at a point as nearly as possible equidistant from the Atlantic and the Mediterranean. The great natural barrier between the two countries has, up to the present, only been surmounted by the iron road at the two extremities of the range, near Bayonne and Perpignan. Both of these routes necessitate a long *détour* for traffic between the south of France and the north of Spain, even the carriage-roads over the mountains being all inaccessible during the winter months. The advantages of a direct railway midway through the Pyrenees would, therefore, be unquestionable, as, in addition to developing intercourse between neighbouring provinces, at present separated by an unbroken wall, the monotonous journey between Paris and Madrid would be shortened by about 100 kilomètres. The initiative of this useful undertaking is due to the Spanish Government, which has introduced a Bill into the Cortes authorising the construction of the tunnel, and of a railway leading from Madrid directly to its entrance. The Government of King Alfonso offers to provide half the funds for the tunnel on condition that France undertakes an equal share in the expense.

Theatre-building in New York.—The new Wallack's Theatre, now building on Broadway near Thirtieth-street, is intended to be as far in advance of the other places of public entertainment in New York in security against fire as the Madison-square Theatre is in ventilation and mechanical appliances. The *American Architect* says:—The front, side, and rear walls of the structure are of brickwork nearly 3 ft. thick, the proscenium wall, between the stage and the auditorium, is 2 ft. thick, and the exits are of unusual size. As only the rough walls are done, it is of course impossible to judge of the remaining part of the construction; but it may certainly be said that the skeleton of the structure has all the qualities that need be desired. This example proves that the additional cost of erecting such buildings in a manner at once solid, safe, and beautiful, does not deter managers from their enterprises, and it would seem in every way desirable that the New York Building Department should seize the opportunity to adopt as nearly as possible those admirable regulations for the construction of theatres which have been recently promulgated in Paris. No hardship would be inflicted upon any one by the enforcement of these rules in relation to all future edifices of that class, while the ultimate saving of life and property would probably be of inestimable importance. The coming decade will undoubtedly witness the building of many theatres in the upper part of New York, and it is quite time to make sure that Mr. Wallack's example will be generally followed, and, if possible, improved upon.

Birmingham Architectural Association. The total number of members is now forty-four, of whom twenty-nine are ordinary, and fifteen honorary members. The annual meeting was held on the 2nd of November, and was well attended. The president, Mr. George Ingall, delivered an address; and the whole of the class drawings were exhibited, in addition to a numerous collection of sketches, photographs, &c. The ordinary meetings held during the session were occupied as follows:—Address by the Chairman, Mr. R. B. Morgan; papers on "Poetry in Relation to Art," by Mr. T. W. Camm; on "Architectural Physiognomy," by Mr. Fred. W. Cross; on "Decoration," by Mr. W. H. Kendrick; one entitled "Some Ideas on the Practical Ventilation of Private and Public Buildings," by Mr. William Henman; lecture on "Art Workmen,—Past and Present," by Mr. John Roddis"; papers on "Proportion," by Mr. A. Reading; on "Japanese Decorative Art in its Relation to the Architect," by Mr. J. W. Tonks; on "Pictorial Art," by Mr. W. H. Vernon; on "Bricks and Terra Cotta," by Mr. Enoch Wood; and on "Renaissance Architecture," by Mr. O. Essex. The meetings of the classes were generally well attended, and a fair amount of work was contributed by the members, especially by those who joined the Elementary Class of Design. The Saturday afternoon visits to buildings were as numerously attended as in previous sessions.

Carlisle.—Extensive alterations and additions have been made to the premises in English-street, recently purchased by Mr. Jas. Atkinson, draper. The back buildings have been entirely rebuilt, and the main front buildings have been gutted and re-modelled. The interior of the shop is effectively lighted by the lantern-roof over a gallery on the first floor. The new premises, comprising shop, show-rooms, millinery saloon, workshops, and workrooms, are now among the most complete of their kind in Carlisle. The works have been expeditiously carried out in a satisfactory manner, Mr. T. Milburn being contractor for brickwork and masonry, and Messrs. Bates & Forster for carpenter and joiner's work; the remaining trades were carried out by local tradesmen. The prismatic lights have been supplied by Messrs. Hayward Bros.; the mosaic floor by Mr. Ebner; and the revolving shutters by Messrs. Clark, Bunnett, & Co. The works have been carried out from the designs and under the superintendence of the architect, Mr. Geo. D. Oliver, of the firm of Messrs. Hetherington & Oliver, of Carlisle.

Moving a Large Hotel.—A large hotel in Boston, the Pelham, was lately moved a distance of 13 ft. 10 in., with a view to widening Tremont-street. The building is of freestone and brick, with frontages of 96 ft. and 69 ft., a basement and seven stories, the total height above the tramways used being 96 ft. The weight was 5,000 tons. The furniture was not disturbed during removal, nor were the occupants of the stores on the first floor and in some of the rooms, the various pipe connexions being kept up with flexible tubes. Substantial stone and brick foundations were made for iron rails and rollers, and the building was forced to its new position by means of fifty-six screws operated by hand against timbers arranged to uniformly distribute the pressure against the building (which was firmly braced in the lower part). Two months and twenty days were occupied in preparation. The moving itself was begun on August 21st, and finished on August 25th, but the actual time of moving was only thirteen hours and forty minutes. The greatest speed was 2 in. in four minutes. The whole cost was about $30,000.

The Church of St. Mary-at-Hill, Eastcheap.—The rector of this parish has given notice of appeal to the Judicial Committee of the Privy Council, from the decision given last week by Lord Penzance in the case of Peek *v.* Trower, refusing a faculty to expend from the parochial funds about 500*l.* for alterations in the interior of the church, which faculty Dr. Tristram, Chancellor of the Diocese of London, had decreed.

The Largest Printing Establishment in the North of England has lately been erected at Leeds, by Mr. A. Cooke. It is three stories high, and consists of a large open ground-floor, with two stories of galleries running all round, and a large open well. It is mostly lighted from the roof, and the roof glazing is done by Mr. Helliwell, of Brighouse, Yorkshire, on his patent system of glazing without putty.

The Female School of Art.—The exhibition of works executed by the students to whom medals and prizes have been awarded for the past year is satisfactory, maintaining the advance which has been lately apparent in the school. Ninety awards have been made to forty-eight students. The Queen's Scholarship, of 30*l.*, has been gained by Constance Wood; the Cloth workers' Scholarship, of 20*l.*, by Mary Elizabeth Harding; the Gilchrist Scholarship, of 50*l.*, second year, by Ethel Chapman Nisbet; first year, Ottilie Amalie Bodé; the Queen's Gold Medal, by Mary Elizabeth Harding; a National Silver Medal, by Florence Reason, Ethel Chapman Nisbet, and Mary Emily Carter; National Bronze Medals: for study from the antique, gladiator, Norah Waugh; for group in water colour, Rose Ethel Welby; for water-colour studies, Edith Harris and Lilian Abraham; and for design, Edith Robinson. National Book Prize, monochrome, the Wrestlers, by Norah Waugh. Gilchrist Prize, 3*l.*, advanced ornament, is divided equally between Edith Rowe and Agnes Lee; the Baroness Burdett-Coutts Scholarship, of 40*l.*, has been gained by Dora Crittenden; and the Baroness Burdett-Coutts Prizes, for modelling a hand from nature, 2*l.*, by Henrietta Marcus; for design for cameo brooch, 1st prize, 5*l.*, Florence Reason; 2nd prize, 2*l.*, Edith Ellison. Some specimens of wood-carving by female students of the National School of Wood Carving, at the Albert Hall, are creditable.

Mr. George Hill, Sculptor.—We regret to announce the death of Mr. George Hill, monumental sculptor, of Merton studios, Manresa-road, Chelsea, which took place on Thursday, the 10th inst., after a short illness. Whilst pursuing his daily vocation, he was seized with paralysis, and died the following morning; he was interred in Brompton Cemetery. For many years Mr. Hill was connected with the late eminent sculptor, J. Birnie Phillip, and took a prominent part in the execution of the podium of the Albert Memorial in Hyde Park, representing architects and sculptors, the Ludgate-hill Viaduct, masonry piers of Blackfriars Bridge, and the spandrel arches of Chelsea Bridge. He was very successful in designing mural tablets; amongst his latter works may be mentioned the reredos sent to Mocha, "Mauritius," pulpits to Chichester Cathedral and Liverpool Memorial Church, of which notices have, from time to time, appeared in the *Builder*, together with many other works executed during his thirty years' sojourn in Chelsea.—*West Middlesex Advertiser.*

Death of Mr. Joseph Nettlefold.—Mr. Joseph Nettlefold, of Birmingham, died suddenly at his Northern residence, near Pitlochry, Perthshire, on Tuesday last. Mr. Nettlefold was for some time the partner of Mr. Joseph Chamberlain, the President of the Board of Trade, and since their enormous screw manufactories passed into the hands of a company, under the title of "Nettlefold's (Limited)," deceased has acted as chairman of the directorate. Only six weeks ago he announced that his magnificent collection of the paintings of David Cox, which has been valued at 40,000*l.*, was to become the property of the Art Gallery Committee upon his death, which has so soon followed. One of the conditions of the bequest is that the paintings shall be exhibited only in a gallery lighted by electricity.

Cantor Lectures.—On Monday evening last (21st inst.), the first lecture of the first course was delivered by Mr. Thomas Bolas, F.C.S., the subject being "Some of the Industrial Uses of the Calcium Compounds." Mr. Bolas alluded to the distribution and occurrence of calcium in nature, and the abundant existence of carbonate of lime as limestone, chalk, marble, calospar, shells, &c. He referred to the new metallurgy of Davy, as initiated by the isolation of potassium; and pointed out the probability that some of those metals which are abundant, but not in general use, may soon come into notable importance.

Birmingham and Suburban Tramways. About twenty miles of tramways are proposed to be laid, for connecting Birmingham and the suburbs, and application will be made to the Board of Trade immediately for the provisional order. The projected scheme will include in its radius stations at Perry Barr, Nechells Park-road, Saltley-road, Small Heath, Sparkbrook, and Moseley. The proposed termini are Albert-street and Corporation-street. The engineer for the northern division, including Perry Barr, Nechells, and Saltley, is Mr. E. Pritchard; and for the other part, Mr. Shipway.

The Hindley Sewerage Scheme.—A special meeting of the Board was held at the Board-room, and the sewerage schemes which had been invited to be sent in, and which numbered ten, were carefully examined, and it was decided that the premium offered, 60*l.*, be awarded to the author of plan No. 7, under the motto "Health," but that the Board do not bind themselves to carry out the scheme. The following were the authors:—No. 1, "Indicator," by Henry Bancroft, Manchester; No. 2, "Non nobis solum," by Winstanley & Ashworth, Manchester; No. 3, "Simplicity," by James Lomax, Bolton; No. 4, "Complete," by Gotto & Beesley, London; No. 5, "Endymion," by J. S. Caldwell, Hindley; No. 6, "Simplicitas et Utilitas," by Newton & Smith, Manchester; No. 7, "Health," by T. & J. H. Nuttall, Bury, Lancashire; No. 8, "Salus Populi," by George Heaton, Wigan; No. 9, "1881," by J. F. Tyler, Parbold; No. 10, "Practical Experience," by Goodison, Atkinson, & Forde, Liverpool. It was decided to send the plan "Health" to the Ince Local Board for inspection.

A New Brewery has just been completed at Burton-on-Trent, for Mr. T. Sykes, of Liverpool. It is erected upon land belonging to the Marquis of Anglesea, near the Midland Railway, upon the south side of the town, and comprises in addition to the complete brewery buildings, the necessary stores, stables, &c., together with roads and boundary-walls. The contractors for the buildings have been Messrs T. Lowe & Sons; for the coppersmiths' work, Messrs. Bindley & Briggs; and for the machinery, Messrs. Buxton & Thornley, all of Burton. Messrs. Gimson & Co., of Leicester, have supplied the ironwork for the building, and Mr. J. Stanyon has acted as clerk of works. The whole work has been carried out from the designs and under the superintendence of Mr. J. B. Everard, C.E, of Leicester.

Wonders at Welbeck Abbey.—H.R.H. the Prince of Wales, during his visit to Welbeck Abbey, will observe the marvellous works carried out by the late Duke of Portland, not the least of which is the new range of stable buildings, erected upon a magnificent scale, presenting a noble appearance on approaching, and the interior of which, for 130 horses, was fitted up by Mr. James Barton, of 151, Oxford-street, London, from designs and special patterns approved by the late Duke. The stall and loose-box mangers were made of iron, and surface coated, both inside and out, by the patent enamelled process, rendering them easy to cleanse, and obviating any possibility of infection. The work is said to be probably unsurpassed in the kingdom.

National Association of Master Builders of Great Britain.—Mr. Stanley G. Bird, of London, the president, accompanied by Mr. E. Hughes, of Liverpool, has been making a tour of the Northern provinces with a view of inducing the Local Builders' Associations to join the National. They also brought before the trade in the North the question of their insurance against accidents arising under the Employers' Liability Act, advocating the advantages offered by the Builders' Accident Insurance, which is established on mutual principles. We understand agents were appointed at Preston, Carlisle, Edinburgh, Glasgow, Newcastle, and South Shields.

Clarkson Memorial, Wisbech.—Messrs. S. & W. Pattinson, of Ruskington, say that they were the contractors for this work, although Messrs. Farmer & Brindley executed the sculpture and carving.

TENDERS

For the erection of a new building at 14, Austin friars, for Mr. Henry Oppenheim. Mr. E. A. Grüning, architect. Quantities by Messrs. H. Blackwell & R. Griggs:—

John Mowlem & Co.	£11,229	0	0
Colls & Sons	10,670	0	0
Holland & Hannen	10,514	0	0
E. Lawrence	9,975	0	0
Wm. Brass	9,893	0	0
Clarke & Bracey (accepted)	9,585	0	0

For the erection of premises in Carter-lane, Doctors'-commons. Mr. Alexander Peebles, architect:—

McCormick & Sons	£7,778	0	0
Colls & Sons	7,591	0	0
Ha l, Beddall, & Co.	7,337	0	0
Jerrard	7,096	0	0
Mark Patrick & Son	6,973	0	0
Lathey Bros.	6,904	0	0
Macey & Sons	6,865	0	0
Ashby & Horner	6,787	0	0
Ashby Bros.	6,576	0	0
Kirk & Randall	6,508	0	0
Morter	6,433	0	0
Clark & Bracey	6,408	0	0
Lawrance	6,185	0	0
Perry & Co. (accepted)	6,175	0	0

For pulling down and rebuilding No. 321, Oxford-street, Mr. Collins, architect. Quantities supplied:—

Sabey & Son	£4,000	0	0
Robinson	5,720	0	0
Brass	5,312	0	0
King & Son	5,300	0	0
Dove Bros	5,291	0	0
Ashby Bros.	5,236	0	0
McLachlan & Sons	5,230	0	0
Mark	5,200	0	0
Morter	5,065	0	0
Abrahams	4,998	0	0
Croaker	4,970	0	0
Kirk & Randall	4,960	0	0
Downs	4,837	0	0

For alterations and additions, gymnasium, &c., to Woodford Lodge, for Mr. W. Savage. Mr. Charles Bell, architect:—

Egan, Woodford	£1,000	0	0

For a Mission Chapel at South Tottenham. Mr. Charles Bell, architect:—

Humphreys & Son	£1,250	0	0
Thornton	1,162	0	0

For new Wesleyan Chapel at Skegness. Mr. Charle Bell, architect:—

Kidd	£2,575	0	0
Dunkley	2,150	0	0
Topham	2,034	0	0
Riggall	1,989	0	0
Holmes (accepted)	1,847	0	0

For sanitary works, Elm Park Estate, Finchley. Messrs. E. E. Croucher & Co., Chancery-lane, surveyors:—

McKenzie, Williams, & Co. (accepted)	£200	0	0

For the construction of road and drainage works on the United Land Company's Sudbury Estate:

Nowell & Robson	£4,613	0	0
Wilson & Stodhard	4,301	0	0
J. Cardus	4,295	0	0
W. Crockett	4,085	0	0
C. Killingback	9,999	0	0
G. Acock	3,975	0	0
T. Wainwright	3,955	0	0
J. Pizzey	3,928	0	0
B. Cooke & Co.	3,894	0	0
Dyer & Huntley	3,895	10	0
H. Haynes	3,650	0	0
G. Felton	3,618	0	0
Ford & Everett	3,499	0	0
W. Neave & Son	3,140	0	0
Rowland Bros. (accepted)	3,2 0	0	0
Wilkes & Co. (too late)	3,378	0	0

For the construction of roads, drainage, and bridge on the United Land Company's Gordon House Estate, Isleworth:—

Nowell & Robson	5,338	0	0
J. Pizzey	5,285	0	0
C. Killingback	4,899	0	0
Cooke & Co.	4,751	0	0
J. Ball	4,614	0	0
Wilson & Stodhard	4,575	0	0
Beadle Bros.	4,570	0	0
Wilkes & Co. (too late)	4,531	6	1
Dyer & Huntley	4,196	0	0
Neave & Son	4,119	0	0
G. Felton	4,015	0	0
G. Acock	3,967	0	0
Tomes & Wimpey	3,587	0	0
Ford & Everett (accepted)	3,333	0	0

For a new roof of English oak, to be covered with lead, on the north transept of the Priory Church, Christchurch, Hants, for the Restoration Committee. Mr. B. Edmund Ferrey, architect:—

White & London	£780	3	0
Brock & Son, London	745	0	0
Higgs & Hill, London	744	0	0
Hoare Bros. & Walden, Bournemouth	740	10	0
W. Griffen, Wimborne	732	7	0
J. Stone, Christchurch	722	10	0
Searle & Co.	597	0	0
S. Mintey, Bournemouth	575	10	0
J. B. Hyde, Christchurch	490	0	0
H. W. Jenkins & Son, Christchurch	489	0	0
W. Howe, Christchurch (accepted)	419	14	0

For residence, Gipsy-hill, for Mr. W. H. Vaughan. Mr. Edwin T. Hall, architect. Quantities by Messrs. Evans & Deacon:—

Marriott Bros., High Barnet	£2,951	0	0
J. Holloway, Lavender-hill	2,741	0	0
J. Garnham, Norwood	2,734	0	0
C. W. Fox, Anerley	2,710	0	0
G. & S. Fisher, Camberwell	2,578	0	0
B. E. Nightingale, Lambeth*	2,530	0	0

* Accepted.

For stables, Tunbridge Wells, for Mr. C. G. Hale. Mr. Edwin T. Hall, architect:—

Ponnett & Sons, Tonbridge	£630	0	0
Strange & Sons, Tunbridge Wells	616	0	0
Hope & Constable, Fensburst (accptd.)	550	0	0

For additions to the Hermitage, Crowborough, Sussex, for Mrs. J. H. Barclay. Mr. Edwin T. Hall, architect:—

Punnett & Sons, Tonbridge (accepted)	£850	0	0

For alterations to the Crown and Anchor public-house, Brook-street, Ratcliffe, for Mr. T. D. Hill. Mr. T. W. Barry, architect:—

King & Son	£520	0	0
T. Shuff	430	0	0
Bodwin (accepted)	350	0	0

For the erection of dwelling-house and stables at Willesden, for Mr. H. Dobbin. Mr. H. W. Sexton, architect:—

B. T. Wood (accepted)	£735	0	0

For alterations to the Old Red Lion, Aldersgate-street. Mr. H. W. Sexton, architect:—

E. J. Laughton (accepted)	£280	0	0

For the erection of house and shop, Charles street, Stepney, for Mr. Gilson. Messrs. Hammack & Lambert, architects:—

Parrott	£1,460	0	0
Cabitt	1,340	0	0

For the erection of new schools, Stamford Hill, N. for the Tottenham School Board. Messrs. E. Ellis & Son, architects:—

Rawlinson, Tottenham	£10,866	18	0
Harradine, Gloucester-road	10,089	0	0
Humphreys & Sons, Tottenham	9,875	0	0
Morton, Crouch-hill	9,785	0	0
Harper, Hackney	9,775	0	0
Shurmur, Lower Clapton	9,750	0	0
Harris & Wardrop, Woolwood-st.	9,621	0	0
Crockett, St. Pancras	9,600	0	0
Goodman, Barnsbury	9,494	0	0
Mattock, Bros., Wood Green	9,393	0	0
Seal, Bros., Richmond	9,345	0	0
Higgs, Park-lane	9,330	0	0
Gardener, Waltham Abbey	9,283	10	6
Linzell, Tottenham	9,238	0	0
Perry & Co., Bow	9,127	0	0
Angood, Finsbury Park	9,100	0	0
Bentley, Waltham Abbey	8,985	0	0
Parker, Peckham	8,946	0	0
Higgs, Loughborough Junction	8,892	0	0
Richardson, Clapham	8,784	0	0
Vernon & Ewens, Westminster	8,781	0	0
C. Wall, Chelsea	8,760	0	0
Palmer & Sons, St. George's, E.	8,653	0	0
Wood, Hackney	8,541	0	0
Childs, Tottenham	8,403	0	0
Williams & Wheeler, Ravenscourt Park	8,260	0	0

For the erection of three cottages and garden walls at Newington, St. Lawrence, Kent, for Mr. William Spain. Mr. E. L. Elgar, architect. Quantities supplied:—

T. Duckett	£774	5	0
T. S. Hobbs	731	10	1
T. Bugden	535	10	9
T. Elgar	532	0	0
B. J. Cowell	530	0	0
Newbr, Bros.	514	0	3
H. Bowman	496	0	0
E. Cullen (too late)	480	0	0
W. H. Port	479	0	0
C. Home (accepted)	435	0	0
S. B. Redman	430	0	0

For the erection of cow house and stabling, Blagden Farm, Merton, near Maldon, for Mr. T. C. Cowper-Essex. Mr. Walter Graves, architect:—

Haynes, Alperton	£320	0	0
Pollard, London	277	0	0

For erection of farm buildings, &c., Crofton Court, Bromley, Kent, for Mr. H. Norman:—
Taylor & Son (accepted).

For the erection of a country residence at Starts-hill, Orpington, for Mr. J. L. Lovibond. Mr. G. St. Pierre Harris, architect:—

Grubb, Bromley	£1,385	0	0
Haisman, Foots Cray	1,156	0	0
Wood, Chislehurst	1,130	0	0
Taylor & Son, Bromley (accepted)	1,049	0	0

For stables, coach-house, &c. at the Maxwell Arms, Orpington, for Messrs. John Fox & Sons. Mr. G. St. Pierre Harris, architect:—

Treadwell, Orpington	£629	0	0
Grubb, Bromley (too late)	545	0	0
Wood, Chislehurst	478	0	0
Haisman, Foots Cray	459	0	0
Taylor & Son, Bromley (accepted)	453	0	0

For school-room at Starts-hill, Orpington. Mr. G. St. Pierre Harris, architect:—
Haisman, Foots Cray (accepted) £270 0 0

For a house in Tufnell Park, for Mr. Bradley. Mr. George Truefitt, architect:—

Williams & Son	£1,830	0	0
Ball & Wickes	1,708	0	0
Stanley Bird (accepted)	1,700	0	0

For additions to a house, Wimbledon Park, for Mr. Morton. Mr. George Truefitt, architect:—

Aviss & Co.	£1,180	0	0
Aries	1,045	0	0
Stanley Bird (accepted)	974	0	0

For fittings to the London and South-Western Bank, Camden-town. Messrs. Edmeston, architects:—

Lascelles	£459	0	0
Jackson & Graham	456	0	0
Lucas	417	0	0
McLachlan & Sons	410	0	0
Dowsett	389	0	0

For new parochial schools, St. Luke's, Old-street, for the Trustees. Mr. A. Allen, architect:—

Morland	£2,968	0	0
Dove Bros.	2,675	0	0
Lawrence	2,845	0	0
Brass	2,535	0	0
Harper	2,487	0	0
Wall Bros. (accepted)	2,414	0	0

For furniture and fittings, Bermondsey Town-hall. Messrs. John Elkington & Son, architects:—

Seex & Son	£1,220	0	0
Lucraft & Son	1,150	0	0
Shoolbred & Co.	1,102	12	0
M. F. C. Turpin	945	0	0
Tarn & Co.	910	0	0
Bartholomew & Co.	895	0	0
Atkinson & Co.	873	0	0
John Finch & Co. (accepted)	801	12	6

For alterations and repairs to the Black Horse Tavern, High-street, Borough, for the Bodega Company, Limited:—
C. F. Hewlett (accepted).

For warming St. Mary's Church, Greenwich, by their improved system of hot-water apparatus:—
John Edmonds & Co., Lillie-bridge, accepted.

For heating apparatus to the Convent of the Sacred Heart, Wandsworth:—
John Edmonds & Co., Lillie-bridge, accepted.

For new house, with shop and offices, &c., in High-road, Leytonstone, for Mr. W. Watkins. Mr. E. Crosse, architect:—
W. Winsor (accepted) £632 14 10

For two new houses, Abbey-street, Bermondsey, for Mr. Wm. Wilkins. Mr. E. Crosse, architect. Reduced estimate:—
W. Winsor (accepted) £650 0 0

For repairs to eleven houses in Albany-road, Camberwell, for Mr. H. W. Wilson. Mr. E. Crosse, architect:—

G. Warren	£238	0	0
S. Kipps	220	10	0
H. Baldwin (accepted)	215	10	0

For the whole of the blinds to the new Medical Schools, Charing-cross Hospital. Mr. J. J. Thomson, architect:—
Gaynan & Son, Carburton-street (accepted).

TO CORRESPONDENTS.

F. W. H.—J. P.—H. S. S.—Indocta.—Messrs. J.—P. N. H.—J. W. H.—D. W.—H. T.—T. B.—H. F. F.—E. C.—E. P.—T. W. H.—H. H. B.—W. & Co.—W. W.—J. & G.—T. N.—M. & S.—J. E. & C.—R. Bros.—W. B. (sent too late).—G. M.—W. M.—J. E.—E. A. G.—J. B. E.—J. W. S.—W. C. T.—E. S. R.—H. & C.—H. W. S.—E. P. P.—I. & P.—J. B.—A. P.—P. O. E.—H. & L.—J. F.—J. W. S.—A. F.—L. B. & W.—E. T. H.—W. C.—E. H. C. (further information would be needed for a decision; we believe, however, the Board's choice correct).—W. A. I. (thanks, not desired).—Clerk of Works (next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

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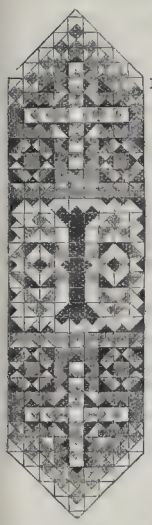
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Greek Houses, and Those who lived in them.

IN the article on Homer's description of the palace of Ulysses it was incidentally remarked that the structure in general distribution had considerable resemblance to the Greek house of historic times. It is as well to be a little more explicit on the limitations under which this can be accepted, for the authorities as to the later Greek house are either scanty or perplexed. Of one general and very important point of resemblance there is no uncertainty, that is, the division of the dwelling into a strictly secluded set of apartments appropriated to the women and the privacy of family life, and another portion comparatively public, where the intercourse of men with men, either for sociability or business, was openly carried on. We may be assured that this rule was adhered to with particular cautiousness at Athens, where the life of woman was one of peculiarly close retirement. The same absence of external windows or openings for light might be assumed, apart from other evidence, from the habits of the Greek burglar, whose name is evidence that he did his "burglaring" chiefly by undermining or digging through walls, having little opportunity to avail himself of the help of faulty or neglected fastenings. Greek houses, like those of any other nation advanced in civilisation, were, of course, very different, and at different times, in extent and in degrees of dignity. Demosthenes could point to the still well-known houses of Themistocles and Miltiades as models of simplicity, while in his own time the expense which was lavished on private dwellings put public monuments to shame. That the houses built in streets of fortified towns, where space was always important, were constructed with walls in common,—not party-walls,—follows, of course; and that with one open market-place, streets and alleys were very narrow,—witness Mediæval Florence and Roman London. But still it is interesting to read in Thucydides how the Platæans broke in hot haste communications through walls of adjacent houses, and so mustered a force in a position to drive a body of intrusive enemies into panic-stricken flight from the Agora, to be hunted down through lanes in all directions. The same causes led to the usual encroachments and their correction. As early as the days of the tyranny of the sons of Pisistratus, a check was placed at Athens upon the projection of upper stories over the streets, the occupation of public pathway by steps, undue extension of front railings, and the system of making street-doors open outwards. In the country no such interference was required, and it was here that the wealthy indulged at once in a national passion for the country, and every variety of taste in the lavish decoration of their mansions.

The arrangements of the house and household of an Athenian citizen of very moderate means are given to us in a speech of Lysias, which has always been celebrated as a model of lucid and effective narrative of circumstances. It was written for Euphiletus in justification of his killing an adulterer whom he surprised within his walls. The defendant has occasion to lay stress on the narrowness of his means as proving his superiority to sordid motives in the vengeance which he took in preference to accepting compensating ransom; he speaks of his house as a small one, and he had but one young female servant, apparently a slave, to go to market and to attend on himself with his wife and infant.

His dwelling, he says, consists of two floors of equal extent, above and below,—*gynæconitis* and *andronitis*, that is, as distributed into female and male divisions. Small as the house might be therefore, there was at least the same understood separation which was much more of a reality in larger establishments; just as our builders are called on now to provide nominal kitchen, dining-room, and drawing-room in small houses where the occupants disregard by choice or perforce all such niceties of appropriation. In the house of Euphiletus the stairs were as steep as they must be in cramped space, so much so that to avoid peril to the wife in going down stairs with the infant when it was to be washed—high service was not—the husband changed the usual arrangement, and put the women on the ground-floor; he himself not only sleeping above, but having his ordinary living-room there, so when he brought home a friend whom he casually met belated, it was there that they dined. On another occasion when he returned unexpectedly from the country, he took dinner in the upper chamber with his wife; afterwards she went down, professedly with reluctance, to attend to the infant that the servant, her accomplice, had caused to cry, and after some banter of pretended jealousy shut the door upon him and locked him in. In the course of the night while alone, he hears both the doors go, the *aulcios* and the *metaulos*, but his curiosity for the cause was parried by a tale that the lamp kept by the infant had gone out and had to be re-lighted from a neighbour's. In this small dwelling the dignified titles for the doors signify no more than the house-door and the room-door; the door of the hall and the door beyond the hall or entrance passage. On a later occasion, Euphiletus has warning from the servant-girl of the injury done him; by threats of hard labour and torture which he was competent to inflict on his own responsibility, he had frightened her into confirming information received from a slighted paramour of the seducer. He is able to descend and quit the house without passing through rooms on the ground-floor, and carries out his purpose; in fact, he brings in a number of friends to bear witness to his act and its provocation, as well as for aid in case his injurer is armed, bursts in the door, first binds Eratosthenes hand and foot, and then, rejecting all supplications and offers of money, kills him on the spot, as by the Athenian laws he was in such case held harmless in doing.

In another speech of Lysias (adv. Simon., 96), the scene of an offence complained of was a house large enough for the usual female apartments to be on the ground-floor. The notice illustrates the strictness with which the separation was sometimes if not ordinarily preserved; the words are,—"he came to my house at night intoxicated, and, forcing the doors, made entrance into the women's apartment, among my sister and nieces, orphan girls who have led such well-ordered lives as to be abashed at being seen even by members of the family."

Another act of violence which came before the courts introduces us to a domestic scene in the country-house of an Athenian of sufficient property to be liable to the onerous charge of a trierarchy. We are not concerned with the general merits of the quarrel or validity of counter claims. Upon whatever pretence, Euergus and Mnesibulus broke down the door of his house that communicated with the garden, and came upon his wife and children as they were at a meal in the *aule*, which here is evidently a proper court. An old nurse of the owner was with them at table; she had received her freedom from his father and afterwards married; but being left a widow and unprovided for, was taken back into the family from respect and gratitude, and also as a useful help to the wife in keeping house during the absence of the master on public duties. The old lady certainly gave proof that she merited most loyally the confidence placed in her, and to be spoken of as attached and faithful. The rest of the female servants were in a tower (*purgos*) which they ordinarily occupied, and when they heard the noise of the intruders, fastened themselves in and escaped molestation. The intruders, in fact, were seizing all they could lay their hands on in the house, after having already carried off a flock of sheep in the field, with the shepherd and a boy in charge of a copper vessel of considerable value. The wife protested with spirit, but in vain, that some of the objects seized were her separate property—part of her dowry. The old nurse, seeing how things went, caught up the vessel (*cymbium*) from which she was drinking and put it in the fold of her upper dress; the material is not mentioned, but it seems to have been of value by the fight that was made for it; she did not loose her hold till she had been beaten, half throttled, her arms and hands

twisted back, and she was so much injured as to need a doctor afterwards. The tower also was plundered of its contents the next day; by its name and the resistance which it offered at first, it reminds the writer of the ancient tower, — round in this instance, — which remains attached to the rebuilt farm of Godlingstone, near Swanage; by the thickness of its walls, and other indications, this has the appearance of having been provided as a place of refuge in case of danger of surprise by marauders from the adjacent coast.

Another informant of peculiar intelligence is Xenophon. Xenophon is never so much in his element as when he is insisting on the value of intelligent organisation; whether he is arguing for the existence of a Divine Providence from the bodily and mental constitution of men,—from the scheme of dentition by which incisor teeth are placed conveniently in front and the molar behind at the sides, or from the distribution of instincts between man and woman, by which one sex is as well fitted for the care of the young and supervision of the home as the other for procuring its comforts through exposure, labour, and conflict of all kinds out of doors; whether he is illustrating, by theory or record of his own practice and experience, that great principle of the art of war,—the combined employment of all arms for mutual support under variable circumstances, or reporting the maxims of domestic and economical management as accepted by a shrewd agricultural speculator. In the introductory chapter of his "Œconomics" he introduces Socrates as leading up to a primary definition in his favourite way, by citing the contrast, admitted at once to be familiar, between some men who built houses at enormous expense to find themselves most inconveniently lodged after all, and others who at comparatively small outlay provided themselves with dwellings which gave them everything that could be desired. The model economist, Ischomachus, is afterwards quoted as in possession of a house of which the best bedroom supplies a secure place for the most important valuables, while appropriate storage is provided in a cool place for the wine, and in dry places for the corn and like produce of the farm; these are included in the female division of the house, which is capable of being shut off from that of the men, more promiscuously frequented, as well for the prevention of pilfering as to keep the numerous male and female slaves effectually apart. The house was built with the principal frontage to the south, and the living-rooms were so arranged as to have full advantage of the winter's sun, while escaping the severest heats in summer. This was effected, as Xenophon tells us elsewhere, by the particular degree of projection given to the protecting porticos. The problem may be stated thus. In the latitude of Athens the noonday sun at Midsummer has an altitude of 70 degrees, and at the equinox, of 50; let it be required to give such projection to a screen from the vertical wall that a given breadth on the ground in front will always be in shade at midday in the interval between the vernal and autumnal equinox. A right angle to scale represents the vertical wall and ground line in section; from the point marking the extent of breadth of the latter required to be protected, draw a line at an angle of 50 degrees inclined outwards, then a straight line meeting any point in this from any point on the wall line, will give the projection to scale of the screen required from that point. The problem is scarcely more complicated for other aspects and other hours and seasons. The matter might be worth consideration when windows are about to be protected at random by such verandahs as the dealer happens to keep in stock.

Ischomachus impresses on his wife the value of order from the example of a model of naval architecture,—a large Phœnician merchantship, encumbered as it was necessarily with sails, oars, and ropes, with provision of abundance of weapons and other armament for protection against pirates, and the utensils for a numerous crew; and though thus the space vacant for merchandise was not larger than a dining-room for ten guests, it was, nevertheless, thanks to system, sufficient for storage of a great variety of goods, all within easy reach, and ready for instant delivery, as required. This lesson is part of a course of instruction to his wife which Ischomachus very amusingly details. She might well be thankful for some help, considering the full scope of the duties he expected from a girl whom he says he married in her fifteenth year, and who had been so carefully tended and [brought up on the Athenian system as to have previously been allowed to see and hear and make inquiry about as little as possible. What experience she did bring was in looking after maids engaged in spinning wool, in cutting out a garment, and, what our agriculturist expresses high appreciation of, a knowledge of cookery. He comes in at last for a touch of that irony from which few of those who talked with Socrates got off scot free. He vaunts in lofty terms the distinction of his father above all the Athenians for the love of agriculture, which he himself has inherited. Socrates gently brings him into the position of having to admit that this love is much the same that a merchant has for a cargo of corn; it is at last a love for the money it brings. "You are sportive, Socrates," is the reply; "but this, I conceive, is no more than is the case with those who are said to be fond of architecture,—who are used to sell houses as soon as they have completed them, and begin at once to build others." "Yes, by Jove, Ischomachus! and I dare swear that I have full confidence in your naturally conceiving that all men love whatsoever they conceive they will make a profit by."

In the pseudo-Aristotelian "Œconomics" the rule is stated that a house should be airy or well ventilated in summer and sunny in winter, and, therefore, protected from the north,—that is, of southern aspect,—and it is to be not of equal breadth (*isoplates*); which seems to mean, not forming an equal-sided block as unfavourable to circulation of air. So, it is said, both daily comfort and health will be best consulted.

Not much more is to be obtained from the Greeks at first hand respecting their houses; but we have now to turn to the description of one in considerable detail by Vitruvius,—to turn, but at first with rather a heavy heart. The description as we read it cursorily is a mass of confusion and inconsistencies; few critics have satisfied themselves in an attempt to reconcile it to reason. The nearest approach to a plausible vindication of it has scarcely fulfilled the condition of being a subject of discussion, by meeting with a seconder. However, one more attempt has to be made, if only to mark distinctly where the description is manifestly at fault or involved in perplexity.

The Greek house, then, that Vitruvius describes as a contrast to the ordinary type of Roman house, is one of a high class,—an example from an earlier and more fortunate time, when refinement and wealth were at their acme in Greece. For anything that appears, he regards the structure as isolated; he gives no hint as to consideration of approaches, prospect, or surroundings, of outbuildings or garden; nor does he trouble himself to inform us about more than the ground-floor; upper chambers, cellars below, and stairs to give access to them, might not exist for any mention he spares of such; he gives no notice of windows opening externally or otherwise for light, or of any arrangements for artificial warming or escape of smoke.

Even as regards the ground-plan, he has scarcely taken us over the threshold before we stumble; we naturally assume that we are brought in for our survey of the mansion through the front door,—the principal entrance; but we find ourselves at once in the women's apartment, the *gynæconitis*, and come to a stand puzzled,—incredulous. There is the usual temptation to take refuge in an accusation of the text as disarranged and corrupt; but Vitruvius is too frequently confused for us to allow him the benefit of any such supposition in the present case, and we must not evade our own responsibility to make the best of the text as it stands, before imputing more than incorrigible clumsiness of exposition to our informant, to whom, after all, we have some reason to be grateful. He says:—"As the Greeks have no occasion for the *atrium* (of the Roman house), they do not construct any, but make a passage of no great breadth from the door of entrance, between the porter's room on one side and the stable on the other, and closed again by an interior door. This space from door to door is called in Greek the *thuroreion*. A peristyle is then entered; this has a portico on three sides; on the side which fronts south it has two *antæ*, very openly spaced, which carry beams, with a recess two-thirds of their interval in depth; some call this a *prostas* and others a *parastas*. Interiorly from this is the large apartment in which the materfamilias presides over the women occupied with spinning their wool. To the right and left of the *prostas* are placed the bed-chambers, of which one is called the *thalamus*, the other the *anti thalamus*. Around in the porticos are disposed the day-rooms for meals, bedrooms, and domestic offices. This part of the building is called the *gynæconitis*" (or feminine division).

Nothing, upon consideration, can be clearer than that Vitruvius introduces us into the house by what would be accounted a back door, by comparison with either the arrangements of the palace of Ulysses or of the modified Greek houses of Pompeii. His mention of the omission of an *atrium* at starting is misleading enough, as it is a natural inference that the next feature he describes is a substitution for it in position.

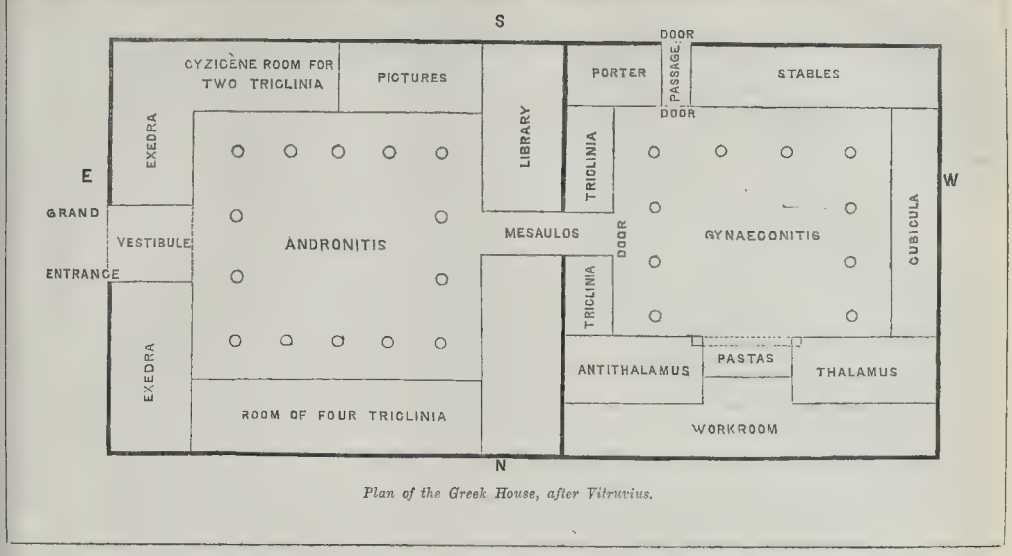
That a doorkeeper is mentioned elsewhere, as we shall see, as the custodian of the main entrance to an *andronitis* of a dignified mansion, makes no difference. We do not need the information that Aristotle volunteers, that in a large house, comings in and goings out required to be watched, and that the duty might be assigned to a slave who happened to be incompetent for other work. Such watchfulness was even more needed at the domestic end of the house than at the other, where, however, a doorkeeper would also be needful; the house was *amphithuros*, with an external door at both ends, like that by his knowledge of which Lysias himself, passing three doors in all, escaped from the emissaries of the thirty tyrants who were guarding the door of the front court. The porter's room would occupy but little space as compared with the stable, and therefore the entrance passage, which by its express narrowness, has none of the character of a main entrance, would not be in the centre of the front unless a portion of this side of the building was utilised for chambers entered from the peristyle within. The palace of Ulysses was entered, as we have seen, through the equivalent of a farm or stable yard, where animals could be turned loose or tied up; but there is an obvious propriety in the Vitruvian situation of the stables at what we have agreed must be regarded as the rear of the house.

The specification leaves us at liberty to construct rooms, if we please, not only opening under the porticos to right and left, but also under that fronting the *parastas* with back wall common to the stable. The *thalamus* is the best bedroom, and the *antithalamus* would come into use with a modern family as a second best or daughters' bedroom, or, it may be, as a nursery.

As the large workroom has to be entered from the *parastas* at the back, it would extend right and left more or less completely behind the *thalamus* and *antithalamus*. These apartments might naturally be contrived to be no deeper than the intermediate *parastas*, or one or both might have additional depth northwards. Whether the large workroom, equivalent of the *megaron* of Penelope, could receive sufficient light from the *parastas*, and if not, how else it was lighted, is not stated. Vitruvius in other passages gives directions as to admitting light through windows in situations confined by opposite houses, and there is no reason why high windows should not be inserted in the north walls of this *megaron*, if it was really an outer wall.

But this brings us to the question how Vitruvius conceived the rooms of the *andronitis* to be connected with those previously described. His description proceeds in terms which plainly show that he comes to the most stately and dignified portion of the house,—the true front,—last. "To the *gynæconitis* is attached a more spacious building (*domus*) with a broader peristyle and four porticos of equal height, unless that which fronts the south has the columns loftier; a peristyle thus arranged is called a Rhodian peristyle. This structure has a fine vestibule and a stately door of its own, and the porticos of the peristyle are adorned with stucco, plastering, and elaborate *lacunaria*. In the portico facing the north are a Cyzicene *triclinium* and *pinacotheca*; in that fronting the east, the library, *exedræ* opposite the west, and a square, or rectangular room, facing the south, of sufficient size to accommodate easily four *triclinia* with space for attendance and games. This room was for the men's entertainments, as it was not usual for the mothers of families to recline. This peristyle, which men occupied without feminine interference, was called the *andronitis*. . . . . There was a passage between the two courts which was called *mesaulos* as interposed between one *aule* and the other."

It will be seen that it comes out quite plainly in this account, that the true grand front and



Plan of the Greek House, after Vitruvius.

main entrance of the mansion is on the side of the *andronitis*, where it might be expected, and it is simply due to the awkwardness with which the description of Vitruvius takes the whole combined structure in reverse, that he has been charged with making the women's domain a general passageway to arrive at that of the men,—a monstrous arrangement anywhere; how much more so, then, at Athens? The entrance-door and vestibule which he assigns to the *andronitis* are emphatically described as important and fine, in contrast to the restricted *thyroræon*, or hall passage, which admits to the *gynæconitis*.

We are left without any specific guidance as to the situation of the connecting *mesaulos*, or the precise collocation of the twin peristyles; so far we are in no way bound to assume that the second peristyle described was placed on the north and south axis, and thus to the north of the first. Such a plan, indeed, would have a primary inconvenience. We should require to place chambers facing the north with their back wall common with that of the large workroom of the women, which would thus be shut in between them and the *thalamus* and *antithalamus* on the other side. We escape this difficulty if we interpret Vitruvius as conceiving that the *andronitis* lay on the east and west axis of the *gynæconitis*; the *mesaulos* then would run east and west from one of its side porticos. There is no reason why this passage, which may be of any breadth, should not be so central as to provide a vista from one peristyle to the other, when doors were opened. Assuming a Rhodian peristyle, the loftier columns of the north portico would be in front of the large room, the dining-room, with its liberal space for those exhibitions and amusements,—the dancing, music, and so forth, of which we have so lively a description in the "Symposium" of Xenophon. The loftier colonnade would admit more of the winter's sun to this apartment, and the greater breadth of the peristyle may be taken to imply such a degree of projection beyond the walls as would intercept the severest summer rays. If we suppose that the outer walls of the *andronitis* continued those of the *gynæconitis*, they might still have a greater lateral extent, and they would in any case have the extra space available for increasing the breadth of the porticos which in the other peristyle is devoted to the *thalamus*.

The *pinacotheca*, which Vitruvius says generally should be of liberal dimensions, is placed on the side of the peristyle facing a loftier colonnade for the benefit of the uniform northern light; and on the same side is a Cyzicene *triclinium*. The normal proportions of this apartment as given demand a ground-plan affording room for two *triclinia* arranged opposite to each other, and passage round them, and a height exceeding the breadth in dimension by one-half. The door was in the middle, with a shuttered window on each side, giving the guests a view, where possible, of verdure. This is an arrangement peculiarly appropriate for a cool summer dining-room, with the enlivenment of a prospect illuminated by the sun. It is noted in another passage that the reason for making the library face the east, is the avoidance of the fading of manuscripts and other damage to books from worms and mould especially, generated by the humid western and southerly winds. The portico fronting westward accommodated *exedræ*. These are rooms for conversation and lounging, which may be of very various forms and magnitude; if they are square, says our author in one passage, their height must be once and a half their breadth,—a rule which, of course, goes for little apart from a specified dimension for a particular plan. Rooms of considerable size are in his mind when he notices that the expanse of wall in an *exedra* prompts to peculiarly broad treatment in pictorial decoration.

If we assume that the larger peristyle is plotted to the eastward of the smaller, the chief entrance and stately vestibule may consistently occupy the centre of the eastern front, intermediately between *exedræ* to the right and left to be entered from the portico; one of these would be in easy communication with the adjacent smaller dining-room, and the other with the larger room for entertainment on the north side. The picture-gallery on the south side might naturally communicate with the library, which, situated under the west portico, would be well remote from any bustle about the entrance and near the more domestic portion of the building.

By this arrangement it will be observed that the stables are thrown to an exterior angle of the building, and are as isolated as circumstances allowed.

A subsidiary extension of the *andronitis* introduces us to some special details of Greek social life. Sets of rooms (*domunculæ*) were provided to the right and left of the great peristyle, exterior to its enclosing wall, where guests were provided with comfortable bedroom and *triclinium*,—sitting-room, in lodging-house phrase,—where they sojourned, with a private door to their independent apartments, and a latchkey or its equivalent (*januas proprias habentes secretam libertatem*). The relation of host and guest was so universal throughout Greece that there was every reason for it to settle down into a system which caused the least embarrassment to either party. The ordinary visit to an English country-house has its unwritten law, which only allows of its exceptional extension beyond the three clear days,—"The rest day, the dressed day, and the pressed day,"—that is, the day when the guest expects to be most cordially urged to stay longer, and may expect to cause perplexity and astonishment, if, like Miss Edgeworth at Bowood, he should unexpectedly comply. The rule with the Greek host was to invite his guests to one formal entertainment, but he fulfilled his duty afterwards if, in addition to lodging, he kept them supplied with eggs, poultry, and farm produce generally.

All rules, however, can be relaxed on occasion, and by whom should they be so, but by one so wealthy as the Athenian Callias? And when so appropriately as at a congress of philosophers? The very liveliest picture we have of an Athenian interior, and that, at the very acme of the age of Pericles, is given by Plato. It seems worth while to translate this, and so to people the scene which we have been engaged in restoring, with dramatic,—with living interest. Socrates then is the narrator,—"With this understanding we set out, and when we had reached the portico we stopped, discussing some subject that had occurred to us on our way; and in order not to leave it incomplete, but that we might finish it first and then go in, we continued our argument in the portico, till at last we agreed. The porter, a eunuch, overheard us, as, I believe, to all appearance, the multitude of visitors had put him out of humour with visitors to the house, and, in consequence, when we knocked at the door, and he opened and saw us,—'Hey, day! Sophists again,' he says, 'he is engaged': at the same time he slammed the door with a will with both hands, as hard as he could. . . . . When at last we entered, we found Protagoras walking up and down the peristyle, and in a line with him there were walking on one side of him Callias, the son of Hipponicus, and his brother by the mother's side; Paralus, son of Pericles, and Charmides, son of Glaucon; and on the other side, the other son of Pericles, Xanthippus, and Philippides, son of Philomelus, and Antimœrus of Meude, who is the most esteemed of the scholars of Protagoras, and studies professionally with a view to become a Sophist himself. Certain others who followed behind these, listening to what was said, seemed, for the most part, to be some of the strangers whom Protagoras is wont to carry off from the cities he passes through, charming them with his voice like a very Orpheus, and they, under the influence of the charm, follow after his voice. Some of our own fellow-countrymen, too, were among the chorus. It was particularly pleasant to me to observe this said chorus, how handsomely they took care never to be in the way in front of Protagoras; but whenever he and they with him would turn, these listeners cleverly and orderly separated to either side, and, wheeling round, kept themselves in the happiest manner still in the rear.

"Next I beheld," as Homer says [the satirical allusion is to the visit of Ulysses to Hades],

"Hippias of Elis on the other side of the peristyle, seated in a chair; and round him on benches sat Eryximachus, son of Acumenus, and Phædrus of Myrrhine, and Andron, son of Androtion, and various strangers, both his own countrymen and others. They seemed to be questioning Hippias respecting physics and details of astronomy; and he, sitting upon his chair, gave his decision to each of them, and went through the questions in detail." [Here, again, there is a satirical parallel to the Minos of the Odyssey, "seated, holding a golden sceptre, giving judgments on the dead." And again in the next clause.]

"'There Tantalus no less these eyes beheld,' for, in fact, Prodicus of Ceus had lately arrived, and was in an apartment that Hipponicus aforetime used as a store-room; but now Callias, from the multitude of his visitors, had cleared it out and applied it to accommodate foreign guests. Prodicus himself then was still in bed, covered up apparently with furs and coverlets in great abundance. There were seated about him on couches close by, Pausanias of Ceramis, and along with Pausanias some youngster, quite a lad, and, as I apprehend, of the most refined and best disposition,—favourite of Pausanias, as likely as not. There was this lad then, and the two Adeimantuses, he of Cetis, and the son of Leucolophides, and some others were visible. What they talked about, however, I could not catch from without, though Prodicus was audible enough,—a mighty wise man he appears to me, and a divine; but in consequence of the grave tone of his voice, a certain hum was produced in the room which made what he said indistinct. And when we had just come in, there came in also, meeting us, Alcibiades, the handsome, as you say he is, and I fall in with your opinion, and Callias, son of Callæschrus."

Leaving these ancient sophists to extricate themselves as best they may when they venture too confidently within reach of the octopus-like dialectic of the son of Sophroniscus, one word of warning and protest may be bestowed in conclusion against "the plan of a large Greek house with two courts," of which it is time that the career should come to an end. We trace it back from the sixpenny "History Primer on Old Greek Life," by the Rev. Mr. Mahaffy, to the "Dictionary of Greek and Roman Antiquities," and thence again backwards to the "Charicles" (1840) of W. A. Becker. The *excursus* of Becker on the Greek house is replete with learning that his successors might gratefully and gracefully give him credit for, if they omit doing so for his plan; this copied and re-copied plan is professedly founded on the description of Vitruvius, but is so divergent from it from first to last, as to be little better than a fanciful conjecture of what a Greek house ought to be. The scheme of the Marchese Galiani, in his edition of Vitravius, is much more meritorious; one of his chief failures is due to a false text, which is corrected on better MS. authority by Scheider. There can be no greater contrast than that between the plans suggested by Perrault, architect of the façade of the Louvre, and Wilkins, except that they are equally inconsistent with the Latin author and the exigencies of Greek domestic life.

ARCHITECTURE IN THE NEIGHBOUR LANDS OF VENICE.

We prefer to express by the above heading the special interest which, from our point of view, is embodied in the volume actually entitled "Subject and Neighbour Lands of Venice," put forth by Dr. E. A. Freeman,* and which is intended as a companion to a former publication of his, "Architectural and Historical Sketches, chiefly Italian." Like the former work, the present one is, to a considerable extent, made up of articles which have appeared in a well-known weekly periodical, where we remember to have read some of them. The author, however, tells us that a larger proportion of matter in this volume is new to publication than was the case with the former one.

The interest of the work is, after all, chiefly architectural, and it seems intended, and is very well calculated, to serve as a guide-book to the architectural antiquities of a line of country which has not yet been overrun and made commonplace by innumerable tourists, nor brought before architectural readers in innumerable photographs, lithographs, and engravings. The special value of Mr. Freeman's disquisitions arises, as we believe we pointed out in noticing his former somewhat similar work, from the fact that he combines knowledge of architecture with knowledge of history to an extent not often met with in the same person. The buildings which he annotates upon and describes are not regarded merely as specimens of architectural style, but as connected with the history and the national and political relations of those who built them. For this reason the book is a useful one for architectural students to read, as it serves to take them out of the beaten track of mere study of buildings, and to suggest a wider view of the subject than architects who go on sketching tours often take to their studies.

The centre around which the contents of the book are intended to be grouped is the remarkable palatial effort of architecture at Spalatro (or Spalato, as Mr. Freeman calls it, but we will keep for the present to the older spelling), in building which, as the author observes, Diocletian "won for himself, or for the nameless genius whom he set to work, a place in the history of art worthy to rank alongside of Iktinos of Athens and Anthemius of Byzantium, of William of Durham, and of Hugh of Lincoln." We know not whether that is the best way to put it; for, after all, we are profoundly sceptical as to the possibility of our ever really knowing decisively whose brain actually contrived the architectural structure and design in these cases; but that the palace at Spalatro is as typical and significant a building as any of those referred to, admits of no question. It may, indeed, be questioned if there is any building in the world which more emphatically marks a great epoch in architectural history.

When we say the book is grouped around Spalatro as a centre, we do not imply that this is obviously or ostensibly so in the arrangement of the volume; but the attention is especially directed to those phases of architectural design of the Romanesque period which arose out of the hints worked out at Spalatro, and on the meaning of which Spalatro furnishes the best comment.

There is, however, a great deal of interest to the architectural student, even apart from Spalatro, in the line of route over which Mr. Freeman acts as guide, for everywhere we are among the beginnings of Gothic architecture; everywhere we are introduced to buildings which, besides their historical interest in the wider sense, are in regard to architecture as links between a great past and a great future. The five divisions of the route are into "Lombard Austria," "Trieste to Spalatro," "Spalatro and its Neighbours," "Spalatro to Cattaro," and "Venice in the Footsteps of the Normans." Much of the book, no doubt, would be chiefly interesting to those who either have gone, or intend to go, over the routes mentioned: the latter probably but a small band. But the general reader who is interested in architecture and its relations to history will every now and then come across facts and illustrations which are full of suggestiveness. The description of Aquileia will appeal strongly to those who look on travelling as something more than a way of killing time, or of conforming to fashion. The author gives happily the idea of the peculiar interest attaching to the place. "Aquileia has a character of its own; it is not a ruined or buried city; nor is it altogether like Trier or Ravenna, which, though fallen from their ancient greatness, are cities still. In the general feeling of the spot it has more in common with such a place as St. David's in our own island, that thorough 'church city,' where a great minster and its ecclesiastical establishment still live on amid surrounding desolation." Mr. Freeman usually has a comparison of this sort at hand, and thereby continually reminds the student either what things were in progress at the same time in different countries, or how similar ideas repeated themselves, or how far European architecture was or was not homogeneous in its progress at a certain period of history. The chapters on Parenzo and Pola are very interesting. The church of Parenzo Mr. Freeman pronounces to be a basilica of the time of Justinian, and one which "will hardly find out of Rome and Ravenna any building of its own class to surpass it." The church is, in fact, of very nearly the same period as San Vitale at Ravenna, but would seem to have some features of interest differing considerably from those which characterise the architectural detail of San Vitale. Every arch of the building, says Mr. Freeman, deserves careful study, because at Parenzo "the capitals seem not to be the spoil of earlier buildings, but to have been made for the church itself. Some still cleave to the general Corinthian type, though without any slavish copying of Classical models. Animal forms are freely introduced; bulls, swans, and other creatures are made to do duty as volutes; and when bulls and swans are set on that work, we may be sure that the Imperial bird is not left idle. Others altogether forsake the earlier types; it perhaps became a church built in the dominions of Justinian while St. Sophia was actually rising, that some of its capitals should adopt the square Byzantine form enwreathed with its basket-work of foliage. But all, whatever may be their form in other ways, carry the Ravenna stilt, marked, in some cases at least, with the monogram of the founder Euphrasius." At Pola we are called on to remark, in the sketch of the double gateway (*Porta Gemina*), a peculiarity that "reminds us that we are on the road to Spalatro, and which already points to the arcades of Diocletian. The columns support an entablature with its frieze and cornice, but the architrave is wanting. Does not this show a lurking sign of what was coming, a lurking feeling that the arch itself is the true architrave? Be that as it may, there it stands, sinning, like so many other ancient works, against pedantic rules, but perhaps thereby winning its place in the great series of architectural strivings of which the palace of Spalatro shows us the crowning point."*

On the road to Spalatro the author touches on other points of interest in the architecture of the Dalmatian district; among others, on the remarkable persistence of the Romanesque style up to very late dates in this region, one completely Romanesque church at Zara dating its consecration, we presume on good documentary evidence, from 1407. The tower of St. Mary at Zara, of which a sketch is given, is a remarkably fine example, in a simple form, of the dignity and solidity of architectural expression attainable in this style,—in this instance without a single touch of what can be called ornament of any kind. The chapter on Spalatro is very picturesquely written; the interest of the subject seems to have lifted Mr. Freeman above the usually rather level style of his writing on these subjects. He draws a brilliant antithesis in comparing Spalatro with Rome:—"By the banks of the Tiber the city of Romulus became the house of a single man; by the shores of the Hadriatic the house of a single man became a city." A passage from this chapter we may quote in full, giving the description of the first impression produced by the ruined palace, and the ideas which its place in architectural history not unnaturally suggests:—

"We land with the moon lighting up the water, with the stars above us, the northern wain shining on the Hadriatic, as if, while Diocletian was seeking rest by Salona, the star of Constantine was rising over York and Trier. Dimly rising above us we see, disfigured indeed, but not destroyed, the pillared front of the palace, reminding us of the Tabularium of Rome's own Capitol. We pass under gloomy arches, through dark passages, and presently we find ourselves in the centre of the palace and city, between those two renowned rows of arches which mark the greatest of all epochs in the history of the building art. We think how the man who re-organised the empire of Rome was also the man who first put harmony and consistency into the architecture of Rome. We think that if it was in truth the crown of Diocletian which passed to every Cæsar from the first Constantine to the last Francis, it was no less in the pile that rose into being at his word that the germ was planted which grew into Pisa and Durham, into Westminster and St. Ouen's. There is light enough to mark the columns put for the first time to their true Roman use, and we think how strange was the fate which called up on this spot the happy arrangement which had entered the brain of no earlier artist,—the arrangement which, but a few years later, was to be applied to another use in the basilica of the Lateran and in St. Paul without the walls. Yes, it is in the court of the persecutor, the man who boasted that he had wiped out the Christian superstition from the

* Sketches from the Subject and Neighbour Lands of Venice. By Edward A. Freeman, D.C.L., LL.D. With illustrations. London: Macmillan & Co. 1881.

* The building not long ago unearthed in Pompeii, with arches springing direct from the capitals of the columns, and of which we lately gave a view (p. 51, *ante*), should not be overlooked in considering this part of the history of architecture.

world, that we see the noblest forestalling of the long aisles of the Christian basilica. It is with thoughts like these,—thoughts pressing all the more on us where every outline is clear and every detail is invisible,—that we tread for the first time the court of Jovius,—the columns with their arches on either side of us, the vast bell-tower rising to the sky, as if to mock the art of those whose mightiest works might still seem only to grovel upon earth. Nowhere within the compass of the Roman world do we find ourselves more distinctly in the presence of one of the great minds of the world's history; we see that, alike in politics and in art, Diocletian breathed a living soul into a lifeless body. In the bitter irony of the triumphant faith, his mausoleum has become a church, his temple has become a baptistery, the great bell-tower rises proudly over his own work; his immediate dwelling-place is broken down and crowded with paltry houses; but the sea-front and the Golden Gate are still there amid all disfigurements, and the great peristyle stands almost unhurt, to remind us of the greatest advance that a single mind ever made in the progress of the building art."

After all, as we have already suggested, there still remains the question whether Diocletian is really to be credited with having imagined or inspired this great step in architecture, or whether it is due to the architect, whose name is unknown. On the whole, we are inclined to declare for Diocletian, and to think that a mind capable of great ideas in other subjects was not unlikely to have his own ideas on the architecture of his palace, and to have them carried out. But whether this was so or no, the significance of the work remains the same in an architectural sense, and the spirit in which Mr. Freeman muses over it is the spirit in which to feel the true significance of the connexion between architecture and history. A second chapter on revisiting the place gives a good deal more information as to the topography, architectural and otherwise, of Spalatro.

Very interesting is the chapter on the remains at Traü, with its stern Romanesque cathedral, of which a sketch is given, and in which some of the elements of Gothic architecture seem in a tentative manner to be just struggling into existence. The latter portion of the book, "Venice in the Footsteps of the Normans," is of much interest, especially the chapter dealing with some of the ancient buildings in Corfu. The interior of St. Jason and St. Sosipatros at Corfu, of which there is a sketch, exhibits solid and heavy round arcades and vaulting, rising from columns which show a strange mixture of Romanesque and Venetian feeling. But we must refer the reader to Mr. Freeman's pages to follow out the subject further.

In the preface the author observes that the illustrations of his former volume (already referred to) met with much criticism, with every word of which he himself agreed, but that he thinks the criticism would have been modified if his critics had seen the original sketches from which the illustrations were made. As the said illustrations were, we believe, reduced from the sketches by a fac-simile process (they had all the appearance of being so), we do not see how the criticism could have been much modified; but we are glad Mr. Freeman has the candour to admit that they *were* very bad, and congratulate him on not having disfigured his present volume with anything like them. The illustrations which are given in the latter are all light and sketchy in style, somewhat too much so in some cases, and none of them can be called effective; but they have the appearance of general truthfulness, and are certainly an immense improvement on those in the former volume, about which we felt bound to express ourselves strongly. The present work is a very interesting and useful contribution towards the study of a rather out-of-the-way corner of architectural history.

Employers' Liability Act.—An action, "Adams *v.* Nightingale," was brought at Southwark County Court on Monday by a carpenter for 200*l.* for damages sustained by the fall of a scaffold. Mr. Fitzgerald was for the plaintiff, and Mr. Kemp, Q.C., and Mr. Macdonell for the defendant. A question arose as to the serving of the six weeks' notice required by the Act. The notice was left at a box or portable office in the defendant's yard after business hours, and never came to his knowledge. The judge ruled this not to be a good notice, and nonsuited the plaintiff.

OBSERVATIONS ON THE CONVEYANCING AND LAW OF PROPERTY ACT, 1881.

OUR readers may very likely ask themselves, when they see the heading of this article, whether it has found its way by mistake into the columns of the *Builder*, and is a waif and stray from some legal journal. But it is no wandering creature, and finds itself in the *Builder* because the Legislature, with that singular want of clearness which distinguishes it in so many of its legislative exploits, has chosen to incorporate in an Act which is largely connected with extreme legal technicalities, some provisions which are of importance to the public at large, and especially to the readers of this journal. We hear a good deal from time to time of the necessity for codifying our laws, but it would be well if the Legislature would act on the primary principles which underlie and are the cause of codification, namely, the clear arrangement of separate topics in separate Acts. The Act in question, 44 & 45 Vict., c. 41, comes into operation on the 1st of January, 1882. As we have already said, there is much in it which can only be of interest to lawyers, and therefore we intend to touch solely on the few but noticeable points which are of more general importance. In Section 14, we find an enactment, the desirability for which occupied a good deal of public attention some two years ago. It will be a surprise to many to find a change somewhat vehemently discussed in the press effected quietly and with little notice in this technical statute. We allude to the question of the forfeiture of leases for breaches of covenant. As most of our readers are aware, it has by very many persons been considered as a grievous hardship that, if a lessee neglects to comply with some covenant in his lease, he should, therefore, forfeit his tenancy. On the other hand, it has been said that if covenants are made they should be observed, and that if the bonds of contracts and conditions are loosened no one will be sure that engagements which he has made will be observed by the party bound by them. On the contrary, it has been answered that if a man has suffered loss by the breach of a covenant, he should only receive a pecuniary recompense when that will meet the justice of the case. Let us now see how the Legislature has dealt with this matter. The first sub-section of Section 14 enacts that a right of re-entry or forfeiture for a breach of a covenant shall not be enforceable until the lessor serves on the lessee a notice specifying the breach complained of, and, if it can be remedied, calling upon him to do so, and in any case requiring him to make a pecuniary compensation. Nor is the covenant to be enforceable unless the lessee fails to do these two things which are required of him. Therefore, supposing a lessee has failed to insure his house, he will only be required to take out a policy within a reasonable time after he is required to do so by the lessor; the latter will not be able to take possession of the premises, because of the oversight of his tenant. Next, subsection 2 deals with cases in which the lessor has begun to enforce, by action or otherwise, his right of re-entry, and then the lessee may apply to the Court for relief, which, according to the circumstances, may be granted by the Court, which has full power over all questions of costs and damages. Here, again, is a further protection for the lessee. By Section 3 there are provisions applicable to the case of under-lessees, and the following sub-section refers to Parliamentary leases. The fifth strongly alters existing contracts, because it enacts that when a lease is limited to continue only as long as the lessee shall abstain from committing a breach of any covenant, it shall continue for any longer term for which it might exist but for such covenant. Thus, if in a twenty-one years' lease such a condition is found, and some breach of covenant is committed in the fifth year of the tenancy, still the tenant will be able to continue for the full term, whether the landlord be willing or not, subject to the former paying proper compensation for any damage caused by the non-observance of this covenant. There are, however, some exceptions to the somewhat sweeping character of the enactments upon which we have touched. Briefly stated, they are that Section 14 shall not extend to any covenant against assigning or underletting or forfeiting the premises in bankruptcy, or the levying of an execution on the tenant's interests, nor in the case of a mining lease to a covenant allowing the lessor to inspect the books, weighing-machines, &c., or the mine and its workings. Nor does the section alter the law as regards non-payment of rent. Still, even with these limitations, there can be no question that the session of 1881, so profitable a one for the tenants of Irish agricultural land, has not been barren for tenants of all classes in England. A tenant now may make a slip without giving a vindictive or a grasping landlord the opportunity of taking possession of his property when he has suffered no real injury, and so far it gives a greater security to the tenant, which must make his position one of greater satisfaction to himself. It is important to observe, too, that these provisions do not affect lessees only who begin tenancies next year, for the Act has a retrospective operation, and applies to all existing leases, "notwithstanding any stipulation to the contrary."

The next provisions upon which we will touch are also, as will be seen, not unbeneficial to tenants. At present a mortgagor cannot make a lease which will be binding on the mortgagee, who may at once, under such circumstances, without notice or demand, eject the lessee. But by the 18th section of this Act a mortgagor, while in possession, shall have full power to make leases, and also a mortgagee, while he is in possession, though he may not have obtained a decree of foreclosure. The kinds of leases which are allowed by the Act are, however, strictly defined, and are building leases for any term not exceeding ninety-nine years, and agricultural or occupation leases for any term not exceeding twenty-one years. It appears, however, to be somewhat absurd to make any such limitation, for why should a thirty years' lease, for example, or a twenty-five years' lease, be more injurious to a mortgagee than one of twenty-one years? Once the principle that mortgagors may make leases is conceded, there is no valid reason why there should be more than one limit to his power, and that limit is that they shall not injure the mortgagee's security. It has long been a settled principle in shipping law that a mortgagee of a ship cannot interfere with a charter of it by the mortgagor unless such charter diminishes the value of his security. A charter is only a lease of a ship for a particular voyage or period, and the same principle is as applicable to lands and houses as to ships. These seem to be the two most important general provisions of the new Act. We may take another opportunity of returning to it, but meanwhile all owners and tenants of land and houses should be made aware of the little kernel, so far as they are concerned, which is to be found within the rather large and very dry legislative nut called the Conveyancing and Law of Property Act, 1881.

THE DUDLEY GALLERY.

THE winter exhibition of cabinet pictures in oil, opened this week, contains some very interesting works, though the portion of the exhibition that we come to first in the order of hanging is not very promising. The best works, on the whole, are landscapes, figure pictures being neither very numerous nor in general very interesting, though there are exceptions. Mr. F. G. Cotman's "The Picture Book" (41), a pretty and carefully-finished interior with two figures, is a very agreeable little work. Mr. Dendy Sadler, who is everywhere just at present with his monks, shows us one of them coming down stairs with a goodly piece of beef on a dish, the sign of "A Feast Day" (101), but it is not the best the painter can do. "The Reluctant Model" (142), a studio scene where a painter is struggling with a recalcitrant lay figure, is a clever bit of humour well worked out. Mr. Dickse's "Charmian," a quarter length of an Egyptian girl, is a fine piece of colour; it is rather inexpressive, and is not Shakspeare's Charmian; but then Shakspeare's Charmian is *not* Egyptian. Mr. C. N. Kennedy's "Miss Nelly Bray" (191), a portrait of a young girl seated in a chair, is more than satisfactory; a very artistic portrait. Mrs. Koberwein Terrell shows, in a head under the title "A Long Time Ago," the same power of giving interest to works which are half studies of expression and half of costume, with which she had already familiarised us under her former name: this painting exhibits her best style of work. A pretty head by Mr. R. J. Gordon, "Clarissa," not far from this, should be looked at. A really original little work is that by Mr. S. Newman Downard, "Au Revoir" (152), where a woman of the lower orders, thin and plain, but not uninteresting, stoops from a

window, which forms a frame to the figure, to say farewell to some one below; a canary hung in a cage by the window gives the one speck of bright colour in the painting, which is a very clever one. The figure subjects which it is worth while to mention specially are, however, really very few in number, and we almost pass them all (excepting Mr. Watson Nicol's "A Boycotter," a good study of Irish boy character) till we come to the screen, where we find the centre place occupied by a very pathetic little work by Mr. Arthur Stocks, "Her Last Sacrament" (414), an interior of a bed-chamber where an old dying woman, with two or three relatives and the clergyman, is receiving her last Communion. This is an unusual little picture, and its combination of unaffected pathos and forcible realistic painting without hardness, recals some of the qualities of Mulready, though with a sufficiently different style of execution. On the same screen are two pretty sketches in which figures are the principal objects, by Mr. J. W. Waterhouse, "Sweet Offerings" and "The Toilet" (413, 428), and a little interior with figures of a girl and a dog, "Farewell" (398), by Mr. Lorimer, which is worth looking at.

Two paintings by Mr. W. H. Titcomb, an English painter who has been in Burmah, are of interest, from their evidently uncompromising realism, though hard in effect; they illustrate a "Burmese Lady and Child" (154), and the "Call to Worship" in the interior of a Rangoon Buddhist monastery (353); a highly-finished interior of which the central object is an emaciated Buddhist priest in an orange-coloured robe. The paintings give us an insight into the realities of Burmese life. Mr. Titcomb is the son of the Bishop of Rangoon, and has a new field of study before him in the people of the locality and their customs.

Among the landscapes two of the most prominent deal with water; one of these is a view of our old friend the "Bridge of Sighs" (253), to which Mr. Macwhirter has really managed to give a new effect by choosing an opportune moment when the sunset gives one deep red gleam at the end of the long narrow avenue of buildings, and the water is golden therewith. This is an exceptionally successful picture in realising the effect and the feeling intended. We regret that it is impossible to say the same of the work in the centre place at the top of the room, by Mr. P. R. Morris, called "The Voice of the Deep" (175), which we at first took to be a view of Alpine scenery. It is, in fact, a study of a stormy beach by moonlight, but there is no motion in the waves, no drawing of the essential forms of water in disturbance. Mr. Morris is an admirable painter of several classes of objects, but the sea is not among his facilities. Among other landscapes may be mentioned Mr. Aumonier's "The Thames at Pangbourne" (153), and Mr. Cyrus Johnson's "Manor House, Great Chalfield" (163), a peculiar work, in which the house is seen in the middle distance over a kind of hazy effect of reeds and rushes; these, as foreground objects, should certainly be a little more made out; the effect is an unusual and pretty, but an artificial, one. "On the Way to Rye" is an effective sketch rather than picture (107), by Mr. C. E. Johnson. "A Passing Good Night," a Thames scene with barges (286), by Mr. Ernest Waterlow, is another work which may be characterised as a large sketch, but a very charming one. The same painter has also a forcible little sketch called "Burning Weeds" (26). Why are painters at the present day so exceedingly fond of pictures of burning weeds? We are certain to find the incident in at least one picture in every exhibition. Several landscapes by Mr. Knight and Mr. J. W. B. Knight exhibit the same qualities which usually characterise the works of these artists, with no falling off and no suggestion of novelty; but the works of both are so good in their way that they are never unwelcome. "On the Rother," by Mr. Dillon (316), is a very carefully-finished landscape, a little artificial and heated in colour.

One of the cleverest things in the exhibition is a small painting of fox-hounds leaping a fence towards the spectator, two of the dogs painted in the middle of their leap. This (71), which is by Mr. Thomas Blinks, is as clever a dog picture as we have seen for some time. Mr. Couldery, who has deserted cats for pug dogs, for the present, has an admirable study of one of those sapient-looking animals on the screen (400); and Mr. Dollman paints a capital picture of crows (379) studying the fate of one of their kind who has been hung up as an awful warning. There are two fine flower-pieces by M. Fantin; and an admirable little bit of flower and still life by Mr. Lance Calkin, "Pansies" (170), may be picked out from among other paintings of the same class that are all more or less good.

SOCIETY OF BRITISH ARTISTS.

This seems to be one of the society's fortunate occasions; the Winter Exhibition just opened this week is certainly a much better one than the last Spring Exhibition. The most ambitious among the figure-subjects is Signor Ludovici's "Feu-follet" (5), an idealisation of will-o'-the-wisp, represented by a life-size female figure dancing through the darkness, and apparently swinging from the right hand a light which catches and lights up the right side of the figure. It is a pretty fancy, and an effective way of showing the nude figure under an unusual light; perhaps hardly worth executing life-size, especially as some of the details of colouring and modelling are necessarily lost or obscured in the half-light in which it is painted. At the top of the room hangs a very clever picture by M. Helmick, an artist who has been making his way on the walls of the Royal Academy, "Presents for his Reverence" (144), a composition in which a large room is occupied by three figures only, two peasant women on the right who bring a basket of eggs and other contributions for his reverence, a thin old man seated on the left with his back to the spectator, and turning his head to examine his visitors and their offerings. The attitude of the old priest, who turns away from an immense volume on a desk at his left, is admirably expressive, and the artist has contrived to give sufficient incident to the whole canvas without disturbing the main motive of the composition at all. The picture is emphatically a "composition," in arrangement and in lighting, and has been carefully studied. Two small figure-subjects near this, "Mending a Pen" (139) and "Counsel for the Defence" (148), by Mr. J. Gow and Mr. J. Morgan respectively, both members of the society, are very good. A more important work than these last is an "Interior of a French School of Painting" under the direction of MM. Bougereau and Robert-Fleury, during a rest of the model (50). This, by Mr. W. H. Bartlett, is a powerfully-painted and interesting picture. Mr. Dendy Sadler, who is a member, exhibits (120) a clever painting of an old monk seated before a bureau, the contents of which have been turned out on the floor apparently in the search for the parchment embodying "The Grant," which he has at length found, and is scanning with great satisfaction. "Otter Hunting," by Mr. Noble (125), is a fine study of otter hounds, life-size, quite devoid of the neatness and over-finish which we so often see in pictures of sporting subjects. There is very sweet expression and refinement in the head of the young lady called "Innocence" (162) by Signor Ludovici, junior; but the drawing of the arm is rather rough. Mr. J. R. Reid's "Old and Young" (203) should be looked at. In the smaller rooms there is a good presentation of "Our Baby" (242) by Mr. A. E. Elmslie; and Mr. A. Hill, whose beautiful nude study in the Academy this year, under the name "Tibicina," will be remembered, has a clever small-scale "study in black" (370) of a figure draped only in black gauze. Mr. A. B. Donaldson's "The Ebbing Tide" (378), the title applying in a double sense to the sheet of water in the background, and to a dying knight in armour in the foreground, aims at pathetic feeling which it does not seem quite to realise.

Among landscapes, the sea-pieces of Mr. S. Ellis are the things that have most spirit and originality, which is rather a Hibernian way of putting it; but artistically, it may be said, sea-pieces rank as landscapes. "Squally Weather" (196) is a fresh and powerful work; we will not say that it is free from reminiscences of other more eminent painters of the sea. As usual, Mr. A. F. Grace's landscapes are among the best things in the collection; No. 30 is the most important, it has only some verses for a title, but the "Arun River" (365) is the best, and is a very beautiful thing. Among other landscapes, Mr. John White's "The Dart" (384) should be noticed, and Mr. Cauty's "Home of the Wildfowl" (238), and the same painter's 179, from the "Cotter's Saturday Night"; Mr. Stuart Lloyd's "Southampton Water" (172), Mr. Wyllie's "Coal Derrick in Bagship Reach" (153), and Mr. Goodall's "Reedham Ferry" (147), a very fresh little bit of river with a sailing-boat coming down it. An admirable little work is "Crumbs" (425), by Mr. J. White which is also essentially a landscape, a small work showing some high qualities of expression and composition. There is a flower-piece, by M. Fantin, "Fleurs des Champs" (288), painted with his usual richness and force of colour, though it is a very heavy and loaded style in which to paint such delicate creations as wild flowers.

The water-colour collection is a good one, as indeed it generally is. Touching on one architectural subject, "Interior of Treves Cathedral," by Mr. Wyke Bayliss (634), while admiring its architectural truthfulness of detail, we regret a certain *too* great hardness and precision of effect, which makes the drawing look rather more like a good architectural draughtsman's perspective than an artist's work, which is not what we can generally say of Mr. Bayliss's drawings. His smaller picture, "Interior of Amiens Cathedral" (91), amongst the oil paintings, is a very agreeable work.

A MUSEUM OF CASTS.

The formation of a museum of casts is no new suggestion; the value of these aids to the study of art has long been admitted, and considerably before the existence of our own Academy, and indeed of any of the foreign academies, collections of casts of the great works of antiquity were formed. Early in the sixteenth century, after the French "discovery of Italy," as it has wittily been termed, one of the first duties of that art-loving monarch, Francis I., was to send back the painter Primaticcio to his country to collect casts, copies, and originals of the great works of sculpture then existing in Italy, and to this day not a few of these replicas, brought to France by Primaticcio, of the treasures of the Vatican, the Uffizi, and other famous Italian collections, will be found at the Louvre; indeed, one of the most interesting courts of that museum consists almost entirely of the casts obtained for Francis, and still serving as instructive lessons to the artists of Paris. As for the debt that England owes to Lord Arundel in the collections he made abroad, it may well be summed up in the words of Peacham, who, in his "Compleat Gentleman," says of Evelyn's friend, the original of Vandyk's familiar portrait, "to his liberal charges and magnificence this angle of the world oweth the first sight of Greek and Roman statues." Evelyn himself, too, may be ranked among those who have thoroughly understood and warmly urged the educational value of good examples to place before the student. The cultivated old diarist in his "Sculptura" (published in 1662) has sketched out at length a model scheme of an art-academy to be provided with casts, and in which was to be supplied ample instruction in drawing and modelling from life, in architecture and perspective, anatomy and geometry, lectures delivered, rewards and travelling studentships to Italy awarded; and let it be remarked, in these days of technical instruction, the suggestion is made "that some professors be well skilled in ornaments, fruits and flowers, birds, beasts, &c., that they may instruct the students in these subjects, which are of great use in our manufactories; and that drawing-masters for schools throughout the kingdom be appointed." The story of Kneller's private academy, which is mentioned by Walpole, that which old Thornhill suggested to George I., and which he himself eventually opened at his own house in James-street, Covent-garden, the long and active existence of the Academy in Peter's-court, St. Martin's-lane, while they form the historically known commencements of the Royal Academy, may all be said to be closely connected with the suggestion of the necessity for a Museum of Casts. As for Sir Thomas Lawrence's collection of casts, which he gathered at such expense, in our youth we remember to have seen it lodged in the cellars of the British Museum, neglected, and certainly never enlarged. It was, it will be remembered, one of the first duties, and one of the most important, of the newly-formed Crystal Palace Company to gather at immense expense, and under the direction of the most competent authorities, its invaluable and well-classified series of casts of the great works of sculpture and architecture down to our days,—a collection which, it may be remarked, though far from unknown to the public, cannot be said to have received the

attention it merits. When, a few years later, the South Kensington Museum was established, among its earliest possessions was a series of choice casts of famous works of art, since when additions have constantly been made to the collection, and a system of exchange with foreign Governments was encouraged. The Architectural Museum, now hidden away in Tufton-street, endeavoured, and not unsuccessfully, to gather a number of casts of works more especially interesting to the architectural student of Gothic art. From various causes, however, the Museum in Westminster has not achieved greatness.

The suggestion re-urged by the President of the Institute of Architects, and supported by the President of the Royal Academy, is, of course, of a more comprehensive and more scientific nature than has been attempted in any of the efforts above mentioned. With the example of Berlin, Munich, and Paris present in the minds of those who have enjoyed the privilege of visiting those cities, it is only too evident that there is in London, as, indeed, in all our great centres, a want of a museum of casts. The cast collection at Munich, in an inceptive condition, and so far but indifferently housed, comprises only copies of Classic works of art; it possesses a very complete collection, there being over 300 entries in the catalogue, consisting of a choice of all the great works known in the museums of Europe, not omitting even the works in the Munich Glyptothek. The collections at Dresden and Berlin are each also as complete; but it will, we think, be found that the Museum of the École de Beaux-Arts in Paris, particularly when it comes to have as an annexe at the Trocadéro Palace the comparative museum of French architectural casts planned by the late Viollet-le-Duc, and which is rapidly approaching completion, affords the most complete existing specimen of what such a museum should be.

When a museum, like that of the École des Beaux-Arts, is able to show to students a *full-sized* cast of an angle of the Parthenon from base to a slice of the pediment, and, as a *pendant* to this superb model, a full-sized cast of the two columns of the Græcostasis at Rome; and grouped round these in the Classic court a characteristic choice of statues ranging from the struggling commencements of the art of sculpture, as shown in the Tenean Apollo cast from the original at Munich, down to the Æginetan marbles, with fully-arranged casts of the pediment figures of the temple, in the excavations of which Professor Cockerell (as has been related in these columns) took so important a share; the Parthenaic pediment in carefully-arranged casts of the well-known figures, as also of that other group with which is so intimately connected the name of Cockerell; the Niobe pediment of the Pitti Gallery, with all the various other later familiar works of Greek and Roman sculpture, among them the Roman horses of St. Mark's ushering in the visitor,—a museum which in its classic court alone offers such a choice as this to the student, and enabling, as we have often seen, the professors after their lecture to point out to the pupils the examples which illustrate their teachings,—it affords, it will be admitted, most of the elements that can be desired. When in addition to this court,—open daily to the public, and on Sundays free to all, — with its adjoining pupils' studies also supplied with a number of other choice works specially lighted for the purposes of study,—the École des Beaux-Arts possesses a Mediæval and Renaissance court, in which can be seen from casts of the quaint Runic crosses from Kirk Braddon in the Isle of Man,—a present, by the way, of the South Kensington Museum, which has exchanged with the French Government several other works here exhibited,—in a specially-designed court, in which are shown, in a light resembling that of the *sagristia* of San Lorenzo, in which the originals exist, the series of the Medici monuments, together with the Moses (not placed, let it be remarked, as in our South Kensington Museum, far above the level of the eye, but in a position resembling that of the original in St. Petro in Vinculo, at Rome),—when, in addition to these, are grouped together as characteristic and numerous a collection of Mediæval and Renaissance works, Italian, French, and German, as the École possesses of Classic sculpture, it will be admitted that much has been done. We possess in England, scattered in different directions, most of the elements necessary for the formation of such a museum as that, the want of which has often been urged. It will be long, unfortunately, before we can hope to possess an establishment of such a peculiar character as the École des Beaux-Arts, with its interesting court-yard crowded with relics of many of the great architectural works of France gathered during the great Revolution by the archæologist, Alexandre Lenoir, the father of the present secretary, with its familiar *cour du mûrier* surrounded by its arcades, decorated with casts of the Elgin marbles, and more recently added to by the coloured copy of the charming della Robbia ware frieze of the Hospital del Ceppo at Pistoja; with its monument to poor Regnault; with a collection of casts as complete as that of which we have given some idea; a collection of copies of the works of the great painters, executed by the "Prix de Rome" students, among which is not least worthy of mention a full-sized copy, by Sigalon, of Michelangelo's "Last Judgment" in the Sistine Chapel, with, under the same roof, a whole series of *ateliers* for the young painters, sculptors, and architects; a "hemicycle" where the prizes are distributed, its walls decorated with the whole history of art in the persons of its celebrities, from the brush of Delaroche; a *salle des modèles* crowded with a mass of smaller casts, such as copies of the beautiful little terra-cotta figures unearthed at Tanagra, and without copies of which no collection of casts can be said to be complete; a huge hall, the well-known *Salle Melpomène* in which are periodically shown the results of the pupils competitions, the "Prix de Rome" pictures, &c. and an art library which, if not as complete as that of our South Kensington Museum, is supplied with all the necessary materials for artistic study, not least among these a bulky collection of the works of several generations of architects, "Prix de Rome" students, gathered in Greece and Italy.

Let this fact be remembered, that our want of such establishments as exist on the Continent, with the facilities given to the public to visit them, places our artists at a singular disadvantage in comparison with their foreign brethren. Our Science and Art Department in default of a by-some-sighed-for Minister of Fine Arts, should look to a point which before long public opinion will urge on its attention. Let us hope that their action when carried out will fully justify the belief of a possibility of "the young student being able to study the rudiments of his science without the necessity of going abroad," a belief entertained and expressed by an artist who may be said to owe almost the whole of his learning and the position he at present occupies to the education he has received abroad.

As bearing on the subject, we give in our present issue a view of the Gallery of Casts which has been founded in Vienna.

THE NEW EXAMINATION, AND WHAT IT INVOLVES.

AT the meeting of the Architectural Association, on the 25th ult., Mr. Aston Webb, President, in the chair, Professor T. Roger Smith read the following paper:—

The examination which all architects proposing to become Associates of the Institute will for the future have to pass comes into force this session, and this Association would hardly discharge the functions which have come to devolve upon it aright were it to take no notice of this circumstance. The step which has been taken in the establishing of this examination is one tending in the direction of measures which have at various times been warmly advocated by this Association. It is one which will largely affect our own members, inasmuch as we include in our ranks so large a proportion of the younger architects of London who are rising up into active practice. There is, therefore, every reason why we should devote an evening to the subject, and I am sincerely indebted to the committee for honouring me with an invitation to read a paper with reference to it.

There are few architectural matters which cannot be better understood by some reference to their history, than if you regard them simply as they present themselves at the present day. Though an examination which has never yet taken place cannot exactly boast of a history, still a little retrospect of the causes which led up to it may help us in understanding its scope. As far back as the oldest member present can remember, that is to say, in the days of Lyon's Inn Hall, the desirability of a diploma for architects, or at any rate of an examination, such as the members of several other learned and scientific professions have to pass, has been dwelt upon in this Association,—and the need of it has always been felt by a certain number of the members of the Institute. Eventually Professor Hayter Lewis, when he was secretary of the Institute, procured the appointment of a committee to consider this question and draw up a scheme for an entirely voluntary examination. The work of that committe was, a good deal of it, done by Mr. Arthur Ashpitel, Mr. John Papworth, Professor Lewis, and myself, and during part of our deliberations we had the co-operation of Professor Kerr. The Institute, as a body, I must confess, looked upon the scheme with coldness, perhaps with some jealousy, and to disarm this jealousy we were compelled to accept limitations which hampered it not a little. No kind of distinction or reward, not even a certificate, was to be gained by passing, no privilege, or grade, or title, was to be accorded to those who passed. The first examination took place in the year 1863, and it is melancholy to think that of those who conducted it, I am the only survivor. The examiners were Sir Gilbert Scott, Sir Digby Wyatt, and Mr. Arthur Ashpitel; the moderators, Mr. John W. Papworth and myself. The result was that eight candidates passed in the class of Proficiency, and in the following year seven, with the addition of two in the class of Distinction, for we had two classes to begin with, and altogether the honour of Distinction was gained by three candidates, all of them well-known members of this Association, Mr Phéné Spiers, Mr. R. R. Bayne, and Mr. T. H. Watson. As years went on this examination languished, mainly, I believe, because it led to nothing; and modifications were introduced with the idea of making it more attractive to students; the most important changes being the abolition of the Class of Distinction; the introduction of a Preliminary Examination; the division of the Proficiency Examination into two portions, which a candidate might take in different places; some modifications of the subjects of Examinations; and last, but not least, the grant of a certificate, and, under some limitations, of the title of Graduate of the Institute. These changes seemed to work well, and the results of the Voluntary Examinations, before and after this introduction, may be summarised as follows:—Ten Examinations have been held during eighteen years. Three students have passed in Distinction, forty-three in Proficiency, and fifty-two in the Preliminary Examination, making a total of ninety-eight successful candidates, whose names you will find in the Brown Book, and many of whom you will recognise as having been in other ways successful since. I must now take a glance into the past, and remind you that some years ago a committee was appointed, at the suggestion of Mr. Horace Jones, to consider what steps could be taken to advance the welfare of the Institute. That committee's report was not agreed to by the general body, mainly on the ground that it advocated the grant of a new charter, and a second committee, which was thereupon appointed, considered the matter afresh. Among the recommendations which it made, this committee reported that after a certain date all Associates of the Institute ought to pass an Examination. The various recommendations of this report were agreed to substantially as they stood, and the changes recommended were adopted. The Examination about to take place is one of those changes, many of which appear to have been of essential service to the Institute, and through it to the profession. I propose now to give you some idea of what we may suppose to be intended by the establishment of this examination, and of what the examination itself will embrace. We may safely put the intention of the Institute as being to render the Associateship of their body a guarantee that the Associate has proved his fitness to be entrusted with work, so far as that fitness can be ascertained by an examination. At present a man is admitted an Associate because nothing is known against him, and something has been said in his favour; but it is not incumbent on him, and, indeed, would not be very possible for him, to prove to the satisfaction of the Council who receive his nomination, or of the general body who elect him, that he is properly qualified; and, accordingly, though Associateship of the Institute has a very considerable value, it is not at all so serviceable to those who have obtained it in the way of giving them standing in

the eyes of the public, as it might be, and as we may hope that in a few years it will be. This being so, the course of examination must be taken as embodying a kind of standard of the qualifications of an architect, and, as such, is a document of no small interest. The draft of it was prepared with great pains and care by a committee on which several members of the Association had seats; it was finally brought to its present shape by the Council of the Institute, and it was passed by the general body, so that among the matters which are involved in the Examination, we may fairly take this authoritative publication of an architectural standard of qualifications as the fairest. A competent architect, then, must be able to design and draw out a building complete, including perspective, details, and ornament, and he must be able to plan and work out a scheme for appropriating a given site to a special purpose. He must be able to write a specification and prepare an estimate. He must also know something of the conditions usually appended to contracts. As far as construction goes, he must be familiar with building materials and how to use them, and calculate the strains upon them. He must know how to drain his buildings, and should have some knowledge of what to do in case of failure and accident. Lastly, as regards art, he should have a general knowledge of the history of our art, and be tolerably familiar with one small portion of that history, and he should possess sufficient acquaintance with the mouldings, features, and ornaments of some one style to be able to use them with correctness in his designs, and to draw them from memory. I do not think that less than this can reasonably be expected of architects who begin practice, in the interests of the public and the profession alike; and should the examination be so conducted as to bring these qualifications to a fair test, the architectural profession cannot fail to reap great benefit. I have recently, before a different audience, given some account of the actual course of examination as proposed in the Institute's programme, and as that must be done here also, you will, I dare say, pardon me if here and there I quote a phrase from the opening lecture of the courses at the University College, the lectures just referred to; though I may as well say at once that I propose to review the course of examination here at much greater length than was requisite in that lecture. The obligatory preliminary work consists of a set of plans with a perspective drawing, a sheet of details, and an ornament. This requirement is, of course, intended to elicit practical skill in architecture generally, and in handling drawing materials and making drawings. Work done as a student,—such, for example, as sketches from ancient buildings, notes, or essays,—may be also submitted at the option of a candidate. This affords an excellent opportunity for a student who has really made studies to show them; and though it does not appear that marks are directly allotted to the preliminary work, there can hardly be a doubt that good preliminary work will tell in a student's favour; for example, it will be likely to induce the examiner to turn the *viva voce* examination into a direction towards which his preliminary studies have pointed. The first subject for examination is the History of Architecture, taking a general view of a wide field and an examination in some detail of a single division of the subject. It is a matter for congratulation that history is thus required, for its value is, I believe, very much underrated. To a certain extent a knowledge of the history of architecture is part of the education of an architect, as distinguished from his mere instruction; and it is a characteristic of the present day that few students, especially young ones, will tolerate any subject of tuition which is to be pursued solely for the purpose of training, expanding, and informing their minds. They want something that will pay. Now that the history of architecture will pay to the extent of 100 marks out of the 600 obtainable, I hope many will give some attention to it, and will, to that extent, get educated in spite of themselves. The answers to this paper are to be illustrated by sketches, and no doubt the judges will be much influenced by really good sketches. The second subject of examination is one intended to show that the student has mastered some one style sufficiently to give him a command over its forms and features,—knows it, in fact, so that he could use it on a building without committing gross errors. This subject is largely a test of practice and drawing, and private study, but there is nothing in which the junior class of design could be more serviceable than in giving the members some idea of what is meant by an accurate use of some one style; though, of course, in preparing for examination, careful private study will be required in addition to attendance at that class. The best preparation by far is measuring, sketching, and drawing out some existing example or examples of the style selected. Even a modern example from the hand of a good architect would be a more instructive study than a book or an engraving. To this subject seventy-five marks are allotted. The third division is Materials and Construction, with Sanitary Science, and I need hardly add, I hope, that practical as well as theoretical acquaintance with these subjects will be necessary, in order to satisfy practical examiners, and must be sought on the works to which the student has access. This group of practical subjects, to which two papers will be devoted, engrosses one-third of the marks, and occupies one-third of the time which is allotted to paper work. It is, therefore, manifestly the most important of the whole, and one in which I venture to think the examiners will be disposed to be more strict than in other cases when marking other papers. The principal building materials can be understood best by those who have experience of their use, and have ripened and extended that experience by reading books, attending classes, making inquiries for themselves, examining, and, when possible, collecting specimens, and witnessing experiments when testing is going forward. "The principles of construction as applied" are words in the programme which seem to cover the theory and practice of building, and the student will have to pursue both. Drainage and sanitary requirements are also named. In this we are all in the position of new brooms, and probably a manifest want of familiarity with the modern ways of executing what is called sanitary plumbing and drainage would induce the examiners to make a clean sweep of the candidate's chances. The application of formulæ will, in all probability, not be pushed far, but it is very desirable that what is done should be right. As there is no preliminary examination, and no subject that is not a strictly professional subject is taken up, the examiners may possibly afford an opportunity for those candidates who are good mathematicians to show their skill by including two or three difficult questions. No doubt, the moderately-trained man will be wise enough to let those questions alone if such are set; and the mathematicians will be heartily glad of them. Considering the heavy risks that attend the failure or fall of buildings, it is a very good thing that this curriculum includes what I may call their pathology. This the aspirant to Associateship cannot learn from any books that I know of; but only from seeing buildings that are dangerous and watching how they are dealt with. It is very desirable to get some notion of how foundations fail, how brickwork fails, how timber breaks or shrinks, or rots, and how masonry yields; and perhaps there is no place which affords more opportunities for the study of these things in old buildings and new than poor leasehold London, founded on clay, run up in haste, with indifferent materials, and too often no professional supervision beyond that of the district surveyor, and no specification save the Building Act. The fourth subject is Planning for a special purpose; it is one more calculated than some of the others to show what the candidate is fitted by nature and training to practise as an architect. No preparation for this paper will be better than making designs in one of our two Classes of Design; but the various opportunities offered by public competitions, by the prizes given in some of the professional journals, and by competing for the Institute prize, and those of this Association, each and all offer good occasions for drawing out and stimulating powers of design. No man is a born planner, and practice is as necessary in this as in any other of the curriculum, perhaps more so. To this subject 75 marks out of 600 are allotted. The fifth subject is writing specifications and estimating, and here a candidate can make 125 marks, though, as the time allowed is rather disproportionately short, he will probably be unable to do as much as he would like in the way of answering questions. My own impression is that specifications will be more thought of than estimating, and, indeed, the questions are described so as to lead one to expect that only a general acquaintance with how to estimate will be required, while an actual bit of specifying has to be done,—and should be well done. The last subject is so much of professional practice as is involved in the general conditions usually appended to a contract. Of course, this must be interpreted as meaning not merely familiarity with the usual clauses, but with the purposes which each is meant to serve, and the dangers and disappointments which each is intended to avert. It does not seem that great stress will be laid on this subject, important though it be, as only 25 marks are allotted to it. The work thus far is done by means of written or drawn answers to printed questions,—*i.e.*, is paper-work only, and it takes up three days,—Tuesday, Wednesday, and Thursday,—the candidates having six and a half hours' work on each day. The examiners, meantime, will give such consideration as they can in the time to the work of each student taken as a whole, with the addition of his preliminary work, and will so prepare themselves for the *viva voce* examination. This, though no doubt actually very formidable to some young men, should really be regarded as a most valuable feature of the scheme. The candidate who has really done something wrong,—as, for example, one who had attempted to send as preliminary work something drawn by another hand (if any one ever was mean enough to try that) might expect to have a bad time of it, as the inconsistency between his preliminary work and his answers would probably have appeared, and he would be pushed hard, and deservedly; but to no student who has honestly prepared himself, and tried to do his best, can the oral examination be other than an advantage. It must not be forgotten that, at any rate in the early examinations, the desire of the Examining Board will be likely to be much more to let men in than to keep them out; and in scanning the work of a doubtful candidate, there will be sure to be a disposition to try to find out the points where he is strong, and give him opportunities of answering some questions about them, than to push him too hard where he has shown signs of weakness. I beg strongly to commend this view to intending candidates who are fairly prepared, and to advise them to look upon the oral examination as their best friend, and not as diminishing their chances of success. The examiners sitting round the table will certainly not desire to admit the unworthy, but I am very sure they will do their best to discover and bring out the worth of the worthy. Finally, the examiners will have to adjudge marks to the work done. The system they will pursue is of course, for themselves to determine, but it will, no doubt, be a uniform one. They will, in all probability, give no marks at all to paragraphs full of irrelevant information, which the student had in his head or had committed to memory, but which are not answers to the questions. On the other hand, correct, exact replies, just to the point, even if brief, will be sure to be marked high. Illustrative sketches, if well done, ought to command good marks; and any answer, be it drawing or be it writing, that is thoroughly right and thoroughly complete, no doubt, will earn all the marks it will deserve. On most systems of marking it would be possible for thoroughly correct answers to all the questions to obtain more than the maximum number. On the least favourable plan, the full maximum must be possible. The limit which a candidate must obtain, in order to pass, is one-half this number, gained not necessarily in each subject, but as the candidate best can; and any moderately good set of answers ought to reach this. If the half is very nearly approached, though not reached, it is to be presumed that the examiners will recur to any memorandum they may have kept of the oral examination, and will re-examine the preliminary work, in order to see if they can fairly increase the number of marks in any subject; and if, after this reconsideration, which I know will be done with a disposition to look into the candidate's merits fairly, and perhaps favourably rather than harshly, the examiners feel bound to reject a candidate, he may be pretty sure that he has not yet properly prepared himself for practice, and that by continuing his studies he will be doing nothing more than that which it is necessary should be done in order that he may, with safety both to himself and to those who may employ him, practise as an architect. Perhaps it is right that I should add that owing to my position at University College, I am, fortunately for myself, not eligible to serve as an examiner, and that in what I have just said I must not be understood as pledging any of the examiners to any special course, but only as speaking from some

experience in the voluntary and other examinations, and from an intimate knowledge of the circumstances.*

THE INTERNATIONAL EXHIBITION OF SMOKE-PREVENTING APPLIANCES.

THE international exhibition of smoke-preventing and fuel-economising appliances, instituted by the Smoke Abatement Committee of the National Health and Kyrle Societies, was formally opened by the Lord Mayor on Wednesday. The exhibition is arranged (by permission of the Commissioners for the Exhibition of 1851, and with the concurrence of the Committee of Council on Education, and the Council of the Royal Horticultural Society) in the east and west arcades and in the quadrants connecting those arcades with the conservatory in the rear of the Royal Albert Hall, Kensington. The catalogue (which, so far as we have tested it, seems to have been carefully compiled) contains a great deal of introductory matter explaining the origin of the Committee under whose auspices the Exhibition has been formed. A useful report on the law affecting smoke is given, and various important meetings held in support of the exhibition are reported very fully. Some of the speakers at those meetings occupy the first rank as men of science, and their speeches,—notably that of Dr. Siemens,—contain much that is valuable and suggestive with regard to what is undoubtedly one of the most important of the many sanitary and economical problems of the day. It has been arranged by the committee that the various appliances and fuels exhibited both for domestic and industrial purposes shall be properly tested for heating power, cost, convenience, quality of combustion, and comparative freedom from smoke and noxious vapours; and to this end they have secured the services of Mr. D. Kinnear Clark, M. Inst. C.E., to superintend the trials, under the direction of the executive committee. Professor W. Chandler Roberts, F.R.S., has undertaken the chemical testing in connexion with the trials of fuel, grates, and stoves. The award of medals on these occasions is often so delusive that we shall look with some curiosity to the result on the present occasion. The exhibition is primarily divided into two classes of appliances, applicable respectively to domestic and to industrial purposes. Objects exhibited in Sections A, B, and C are entirely for domestic, and those in Section D for industrial, use. Section E is reserved for various fuels suitable for either domestic or industrial purposes, or both, and Section F for foreign exhibits of all classes. A plan accompanies the catalogue, and on it the space occupied by the exhibition is divided into blocks or sections numbered I. to XXVII. Boards bearing these Roman numerals are fixed up at intervals to mark these divisions or blocks. Block I. is situate at the south end of the western arcade, and thence the blocks are continued northward into the west quadrant, at the eastern end of which, abutting on the conservatory, is Block XIII. Block XIV. is at the other or eastern end of the conservatory, *i.e.*, at the western end of the east quadrant, and from this point the blocks continue southward until the final one, XXVII., is reached at the extreme south end of the eastern arcade. The stands or stalls, of which there are several in nearly every block, are not separately numbered, but are referred to in the catalogue as being in such and such a block. In the following outline of the contents of the exhibition we will, for the sake of convenience, assume that the visitor will traverse the exhibition from the south-west corner (beginning with Block I.) to the south-east corner (ending with Block XXVII.).

Block I. at the time of our visit was almost destitute of exhibits. Those that were there were not labelled with their exhibitors' names, nor could we find anything catalogued in Block I.

Block II.—Here Messrs. George Green & Sons, of Aberystwith (represented by Messrs. Duncan Bros., of Queen Victoria-street), show a vertical boiler fitted with Green's patent water-hearth, which consists of a shallow box made of boiler-plates, through which the water of the boiler circulates. This box takes the place of furnace-bars, and renders them unnecessary, the upper and lower plates being perforated and connected together with screwed conical tubes of sufficiently large area to allow the ashes to fall through. Messrs. James Newton & Son, of Oldham, exhibit Newton's patent mechanical stoker and fuel economiser, in which the coal, after passing from the hoppers through crushing-rollers, is injected into the furnace by blasts of heated air. The Chadderton Ironworks Company, Manchester (represented by McDougall Bros.) are exhibitors of McDougall's patent mechanical stoker, in which the fire-bars are actuated by what is described as "an eccentricated shaft" of Bessemer steel. The eccentrics are turned on three different centres, and are alternately arranged, each bar resting on and being driven by its own eccentric or cam.

Block III.—Messrs. T. & T. Vicars, of Seel-street, Liverpool, show their patent "self-stoking smokeless furnace," for steam-boilers, &c. In action, a large hopper is filled with fuel, which is fed from thence by plungers, in suitable quantities, on to the bars, where it is coked, and, by their motion, carried backward on to the grated plate. The ends of the bars act as plungers, and break up the large pieces of coked fuel into pieces of a size favourable to active combustion, at the same time forcing it into the flue, where the combustion is completed. The Patent Steam Boiler Company, Birmingham, have on view Knap's mechanical stoking and smoke-consuming apparatus, which consists of a hopper into which the fuel is charged; a slide by which the supply may be at any time cut off; and a crusher-spindle, which revolves very slowly, and carries down the fuel to a reciprocating bar, which feeds the fuel forward through a horizontal shoot. The same company are exhibitors of Root's patent safety steam boiler, which consists of a series of interchangeable tubes of lap-welded wrought-iron. These tubes contain the water and steam. The hot gases and flame from the furnace are thoroughly broken up, on account of the zigzag arrangement of the tubes, which also, being inclined, cause the steam as produced to be collected at the upper ends, and thence to pass through the patent connexions into the steam chamber. Messrs. Knowles & Halstead, of Bradford, show their patent helix furnace-feeder. The helices or screws are made to carry the fuel under the bars and up into the fire at its under side, so as to insure perfect combustion of coal. Mr. James Proctor, of Burnley, shows his patent mechanical stoker and movable fire-bars. Henderson's patent mechanical stoker and patent self-cleaning furnace combined is shown by Messrs. Piercy & Co., of Birmingham. In this appliance, the clinker, instead of being raked out of the furnace in the usual way, by hand, is carried automatically to the back of the grate-bars, and remains there till it is cool, when it is removed without necessitating the opening of the furnace-doors. Mr. Thomas Henderson, of Liverpool, exhibits his patent furnace-front and fire-door for the prevention of smoke in connexion with steam boilers generally, and for the reduction of temperature in the stoke-holes of steamships. Mr. John Collinge, of Oldham, exhibits Blocksage's patent smoke-consumer and fuel economiser, for the steam boilers of stationary, marine, and locomotive engines. It consists of an inclined oven of the length and breadth of the ordinary grate-bars, placed in front of the boiler, and fired by hand. The top and sides of this oven are lined with fireclay blocks, which acquire such an intense heat that the smoke, impinging against them, is consumed. Mr. Collinge also shows some patent fire-backs for domestic stoves, grates, and ranges.

Block IV.—Livet's Boiler and Furnace Company (Limited) are exhibitors of boilers, flues, furnaces, grates, &c., constructed and fitted under their patents. Messrs. Rosser & Russell, a firm well known to our readers, are exhibitors of smoke-preventing doors and bridges, and movable fire-bars, applicable to furnaces for industrial use. Messrs. George Haller & Co., of Lime-street, show Kohlhofer's patent fire-bars and furnace-grates, by the use of which small coal or poor fuel of any kind may be profitably utilised. It is stated that the bars remain cold whilst in use, and that the clinkers do not stick to them. Mr. R. Renton Gibbs, of Liverpool, shows his hot-water heating apparatus, which is favourably spoken of by many architects and others who have used it. We have noticed it on previous occasions. Mr. Josiah Hampton, of Loughborough, exhibits fuel-economising and smoke-consuming fire-bridges for boiler-furnaces, made of cast iron, and having perforations through which air passes to the black smoke and unconsumed gases at the proper point, thus assisting in their perfect combustion.

Block V.—Messrs. J. & J. McMillan, of Port Dundas, Glasgow, are exhibitors of under-grate fuel-feeding apparatus, applicable to boiler furnaces of all kinds. The charges of coal or other fuel are contained in travelling boxes actuated by mechanism. The principle of the invention is applicable, and is shown applied in another part of the exhibition, to domestic stoves and ranges. M. Michel Perret, of Paris, exhibits a grate (*grille immergée*) for boiler and other furnaces, the bars being deep in section and having their lower edges immersed in water. M. Perret's multiple-stage furnace, for heating churches and other large buildings by means of hot air, is shown in action, and appears to be effective. It will burn the poorest descriptions of refuse fuel. We understand that it has been largely used in France during the last four years. The same exhibitor also shows a radiating open fire-grate. Messrs. George Hopewell & Co., of Topsham, Devon, show their patent wrought-iron reversible fire-bars. Mr. T. W. Williams, of Swansea, exhibits a patent oxy-hydrogen furnace for the consumption of anthracite and other smokeless coals without injury to the furnace bars. Mr. M. Holroyd Smith, Halifax, shows some hexagon fire-bars and a model of a helical furnace feeder. Messrs. Geo. Waller & Co., of Southwark, show Smith's patent mechanical stoker and smoke-preventer, for Cornish and other boilers. The Wavish Fuel Economiser Company show a model of a Cornish boiler fitted with Wavish's patent economiser and smoke-consumer; also these appliances adapted to domestic grates. Messrs. W. & S. Deards, of Harlow, exhibit coil and other boilers for heating green-houses, baths, &c. Messrs. G. Hunter & Co., Leeds, are exhibitors of a patent apparatus for smoke-consuming in Cornish, marine, and other boilers. Mr. John Tenwick, Grantham, exhibits patent fire-bars and a smoke-preventing furnace-door.

Block VI.—Messrs. W. A. Martin & Co., of Southwark, show their smoke-preventing doors and furnace-grates, which have been largely used. Mr. C. B. Gregory, of Beverly, New Jersey, U.S.A., exhibits a smoke-burning furnace which he claims to be adapted to all practical purposes, industrial and domestic, and capable of burning all kinds of fuel and refuse matter without smoke. It is portable. The Great Britain Smoke-Consuming and Fuel-saving Company are exhibitors of Orvis's patent appliances. Mr. A. C. Engert, Bromley-by-Bow, shows his patent coking-boxes for the prevention of smoke as applied to steam boiler furnaces. Messrs. Fraser & Fraser, of Bromley-by-Bow, exhibit a Cornish boiler.

Blocks VII. *and* VIII. are chiefly taken up with a large number of exhibits of anthracite and other smokeless coals, besides charcoal, coke, and other fuels. In Block VIII. Mr. George Sinclair, of Leith, shows his patent self-acting mechanical stoker.

In *Block* IX. Messrs. S. Leoni & Co., of the Strand, are exhibitors of gas kitcheners, gas fires, coke and gas fires, hot-air stoves, and grillers and other appliances for cooking by gas.

Block X.—Messrs. Steel & Garland, of Shaffield, show their excellent "Wharncliffe" grate and coal-economiser, the "Kensington" patent smoke-consuming grate (Redmayne's patent), and their patent "Pillar" smoke-consuming hot-air stove. All these specialities will well repay examination. Messrs. Portway & Son, Halstead, are exhibitors of the "Tortoise" slow-combustion heating and laundry stoves. Messrs. W. A. Martin & Co., Southwark, show domestic fire-grates, provided with movable sides to facilitate the combustion of the fuel, which is put on only at the sides in spaces obtained by the propulsion and withdrawal of the movable cheeks. The Eagle Range Company, Fleet-street, are exhibitors of ranges fitted with smoke-consumer and fuel-economiser. Messrs. W. Poore & Co., Cheapside, are exhibitors of American cooking and heating stoves.

Block XI.—Mr. R. W. Crosthwaite, Stockton-on-Tees, shows Armstead's patent hot-air stoves, "Clibanus" cylinders for heating coppers, and Crosthwaite's "Combination" range. Mr. Henry Thompson, Islington, shows his patent grate and apparatus for feeding it with fuel at the bottom of the fire, so as to prevent smoke. Mr. James Smith, Liverpool, shows an open smokeless grate in which the leading feature is that the ash-pit is provided with a close-fitting cover (which can be moved for removal of ashes), and is connected with a pipe or passage

* To be continued.

provided with a damper to control the supply of air. Messrs. J. & J. McMillan here show their under-grate coaling apparatus, as applied to open grates and cooking-ranges.

Block XII.—Messrs. Musgrave & Co., of Belfast, have a large display of their patent ventilating slow-combustion stoves and air-warmers, for burning either coke or anthracite, in which a recently-patented system of air-jets is used to assist in the consumption of the smoke and gases. This well-known firm's "Ulster" smokeless stove-grate is very similar in appearance to a well-designed register-stove grate, but it is provided with a chamber for holding fresh fuel, which replenishes the fire as it burns away, but cannot become ignited until it reaches its proper position in the fireplace. One or two important improvements have lately been made in this grate, which, in its present form, is very well worthy of the attention of visitors. Mr. G. A. Spencer, of Southwark, exhibits an arrangement for feeding stoves and open grates in such a manner that the fresh fuel is introduced below the fire. The Coalbrookdale Company exhibit some fireplaces and cast-iron chimney-pieces and over-mantels in the Adam, Chippendale, and other styles, shown in conjunction with the "Kyrle" and other smokeless grates. The exhibits are distinguished by excellence of workmanship, and fully maintain the reputation of the company. Mr. E. R. Hollands, Newington-Green, shows his patent smoke-preventing fire-grate, in which the fresh fuel is inserted at the bottom of the fire.

Block XIII.—Mr. John M. Stanley, of Rhyl, shows cooking-range, kitchener, room-grate, and baker's oven, in which, by a patented arrangement of outlet flues he claims that the volatile gases are induced by the natural draught of the chimney to pass downward through the fire, and so smoke is prevented. Messrs. M. Feetham & Co., of Clifford-street, are exhibitors of grates, stoves, and kitchen-ranges. The Wilson Engineering Company, Holborn, show their portable kitchen-ranges and stoves, for which they claim the merit of being almost perfectly smokeless.

Block XIV., which is at the west end of the eastern quadrant, adjoining the east end of the conservatory, is wholly occupied by Messrs. Doulton & Co.'s excellent display of tile and other stoves. This firm's slow-combustion radiating tile stoves have on previous occasions been noticed by us. They have come largely into favour, as they deserve to do from their cleanliness, cheerfulness, and efficiency, coupled with economy of fuel. They are thickly lined internally with fire-clay, and will burn for twelve hours or more without needing attention. A large tile stove suitable for use in public buildings is shown. In addition to the internal furnace provided in the smaller tile stoves, it is provided with an open fire-place, which can be used either alone or concurrently with the internal fire. Messrs. Doulton are also exhibitors of ornamental Doulton-ware vases or shafts for use in ventilating on the so-called "Tobin" principle. Their syphon-flue stove is another speciality well worthy of the attention of visitors to the Exhibition.

Block XV.—Mr. William Stobbs, Pimlico, exhibits two American productions, viz., Janes & Kirtland's "Beebe" kitchen-range, for which great things are claimed. The various castings of which it is built up are certainly specimens of finished workmanship. Mr. Stobbs's other exhibit is the Barstow Stove Company's "Crystal" fireplace heater, to burn coke or anthracite coal. It can be fitted to warm rooms above the one in which it may be fixed. Messrs. Newton, Chambers, & Co., of the Thorncliffe Ironworks, near Sheffield, exhibit their "Thorncliffe" improved close and open-fire cooking-range. Messrs. Yates, Haywood, & Co. (Limited) are exhibitors of slow-combustion and other stoves. Dr. Joseph Moore, of Thornton Heath, exhibits an open fire-grate, for use either with anthracite or bituminous coal. It is also constructed with the intention of preventing draughts in a room by precluding more air ascending the flue than is necessary for proper ventilation of the apartment. Messrs. Charles Churchill & Co., Finsbury, show the American "Greene" soft coal cooking-stoves and heating-stoves. Mr. Harry Hunt, Stoke Newington, shows the "Crown Jewel" base-burner anthracite coal-stove, which has previously been described by us.

Block XVI.—Mr. Herbert Lea, Warwick-street, Regent-street, exhibits the "Sunderland" stove. The "smoke-abater" coal-shovel, exhibited by the patentee, Mr. W. S. Melville, of Bow, is an ingenious though simple contrivance for quickly and easily feeding a fire with fresh fuel at the bottom of the grate. Messrs. Clark, Bunnett, & Co., Limited, Rathbone-place, exhibit Ingram's "Kaio Kapnos" fire-gate and kitchen ranges, constructed to burn coke, ordinary house-coal, and anthracite. These grates (which are the invention, we believe, of an architect) are stated to consume their own smoke, and can also be used as slow-combustion grates. The Radiator Range Company show their range and a fire-grate, in which the fire-box is brought forward from the back of the stove. Mr. John Cornforth, of Berners-street, is an exhibitor of open fire-grates designed to consume smoke.

Block XVII.—Messrs. Frederick Edwards & Son, of Great Marlborough-street, exhibit their new smoke-consuming slow-combustion grates, the invention of Mr. Edwards, jun., who is well known to many of our readers as a writer on warming and ventilation. In this grate a body of coals sufficient for a day or a night's consumption is put into the fire-basket or chamber, and upon the top of this mass a fire is made and the coal is allowed to burn gradually downwards. A blind or screen, supported by chains and balance-weights, is moved down by degrees in front of the body of burning fuel. Fur kitcheners, Messrs. Edwards exhibit drawings modifying Count Rumford's principles. Messrs. Barnard, Bishop, & Barnards, of Norwich, have a large and good display of well-designed stoves, kitcheners, and ranges, for slow combustion and otherwise, all constructed for burning anthracite and other smokeless coals. Among the specialities shown by this well-known firm are,—Everitt & Barnard's patent grate; Bartlett's patent grate; the "Anthracite Grate"; and Everitt & Barnard's slow-combustion, smoke-consuming fire-grate, the "Glow." These are all worthy of careful attention.

Block XVIII.—Messrs. Thomson, Sterne, & Co. (Limited), show Clerk's patent gas-engine. Some anthracite stoves shown in this block are exhibited by the patentee, Herr Franz Lönholdt, architect, Frankfort-on-the-Main.

Block XIX.—Messrs. Archibald Smith & Stevens, of Leicester-square, exhibit Russell's patent "Wonderful" self-feeding grates for burning anthracite and bituminous coal, coke, and cinders. This stove, which has been previously described in detail in our columns, is sure to attract the attention of visitors. The British Sanitary Company, Glasgow, show their patent ventilating stove-grate and gaselier canopy. The stove-grate is formed as an enclosed chamber with a glass door and panels. A portable grate, which holds the fire, stands within this chamber. As we understand it, the canopy over the gaselier, when placed in communication with the stove-chamber, is intended to draw off the vitiated air caused by the combustion of the gas. Mr. William Lawrence, of St. Mary Axe, exhibits a variety of stoves for domestic purposes. Mr. G. J. Cox, of the Maidstone Gasworks, exhibits a number of newly-patented inventions for heating and cooking by gas, and he also shows Captain T. S. Clarke's patent smoke-consuming hot-air ventilating grate. Mr. A. C. Eggert shows his coking-box for the prevention of smoke fitted to an ordinary fire-grate. The Derwent Foundry Company, Derby, show smoke-burning register-grates and a smoke-burning gill stove.

Block XX.—Messrs. Thomas Potter & Sons, of Oxford-street, show the patent smoke-consuming revolving fire-grate, the invention of Mr. H. Saxon Snell, architect. It is simple in action, the fire-box or cage being made to revolve upon a pivot, so that when the fire-box is reversed, fresh fuel can be introduced through a hinged grating on its under side, and this fresh fuel is, by the inversion of the the grate, brought undermost. The "Thermhydric" ventilating hot-water open fire-grate, also the invention of the same gentleman, is among the other exhibits of Messrs. Potter & Sons. It is being largely used, with, we are informed, very satisfactory results. Mr. Samuel Rigby, of Blackpool, exhibits smoke-preventing apparatus, which he claims to be applicable to all open coal-fire grates for domestic use. Mr. J. Russell, of Neath, shows a patent flue or blower designed to remedy smoky fire-places. Mr. Henry E. Hoole, Sheffield, shows a radiating and reflecting grate for burning bituminous coal without smoke, and an "interchangeable" grate for burning bituminous or anthracite coal. Messrs. A. Boyd & Son, New Bond-street, show a ventilating warm-air grate for domestic use, in which the iron body, which is lined with fire-clay, is made zigzag to increase the heating-surface. Messrs. Smith & Wellstood, of Ludgate-circus, show anthracite coal and coke burning stoves. Mr. William White, F.S.A., of Wimpole-street, is one of several architects who are exhibitors. Mr. White has here, as in previous exhibitions and in connexion with other subjects, shown that he is capable of uniting practice with theory. His "Shrewsbury" warming-apparatus, and the "Shrewsbury" open-grate radiator and air-warmer, here shown, will be examined with interest. Economy of heat and fuel, and certainty and continuity of action for a great many hours without attention, are among the merits claimed for these appliances.

Block XXI.—Messrs. Brown & Green, of Luton and Bishopsgate-street, are exhibitors of smoke-consuming kitcheners for bituminous coal, and register stoves for anthracite coal. Among their specialities well worth attention are the "Kensington" and "Luton" register stoves. Messrs. J. F. Farwig & Co., of Queen-street, show George's slow-combustion "Calorigen," to burn anthracite or coke. Mr. Robert H. Griffin, of Guilford-street, exhibits his patent ventilating, heating, and smoke-consuming register stove or open fire-grate, of which we have spoken before.

Block XXII.—Mr. Francis Hammond, of Chandos-street, exhibits a hall stove fitted with smokeless fire on Dr. Siemens's principle. Messrs. Deane & Co., King William-street, show Fletcher's patent gas-cooking and heating apparatus, and Crane's patent register grate for burning anthracite, which we described not long ago. The Silber Light Company have a variety of stoves for paraffin and gas.

Block XXIII.—Messrs. Waddell & Main, of Glasgow, show Dr. Siemens's gas and coke fire-grate. There is a hot-air chamber underneath the grate which heats air to between 600° and 700° before it impinges on the gas-jets in front of the grate, performing, in fact, the function of a miniature hot blast. Messrs. James Slater & Co., of Holborn, are exhibitors of steam and gas cooking apparatus. Messrs. George Haller & Co., of Lime-street, show Kohlhofer's hot-air gas-stoves, and Messrs. Ritchie & Co., of St. Swithin's-lane, their "Lux Calor" ventilating stoves. Messrs. Strode & Co., of Cockspur-street, show Schönheyder's patent sanitary stove, containing some recent improvements for heating, lighting, and ventilating, and a great variety of gas fires, stoves, and lighting apparatus, for the excellence of which this firm's name is a synonym. Messrs. Ewart & Son, of Euston-road, exhibit the "Empress" smoke-cure, the "Amethysta" stove, the "New Crown" boiler, ventilating gas-stoves, &c. The catalogue assigns them a position in this Block, but when we saw them they were in Block VII., near the north end of the western arcade.

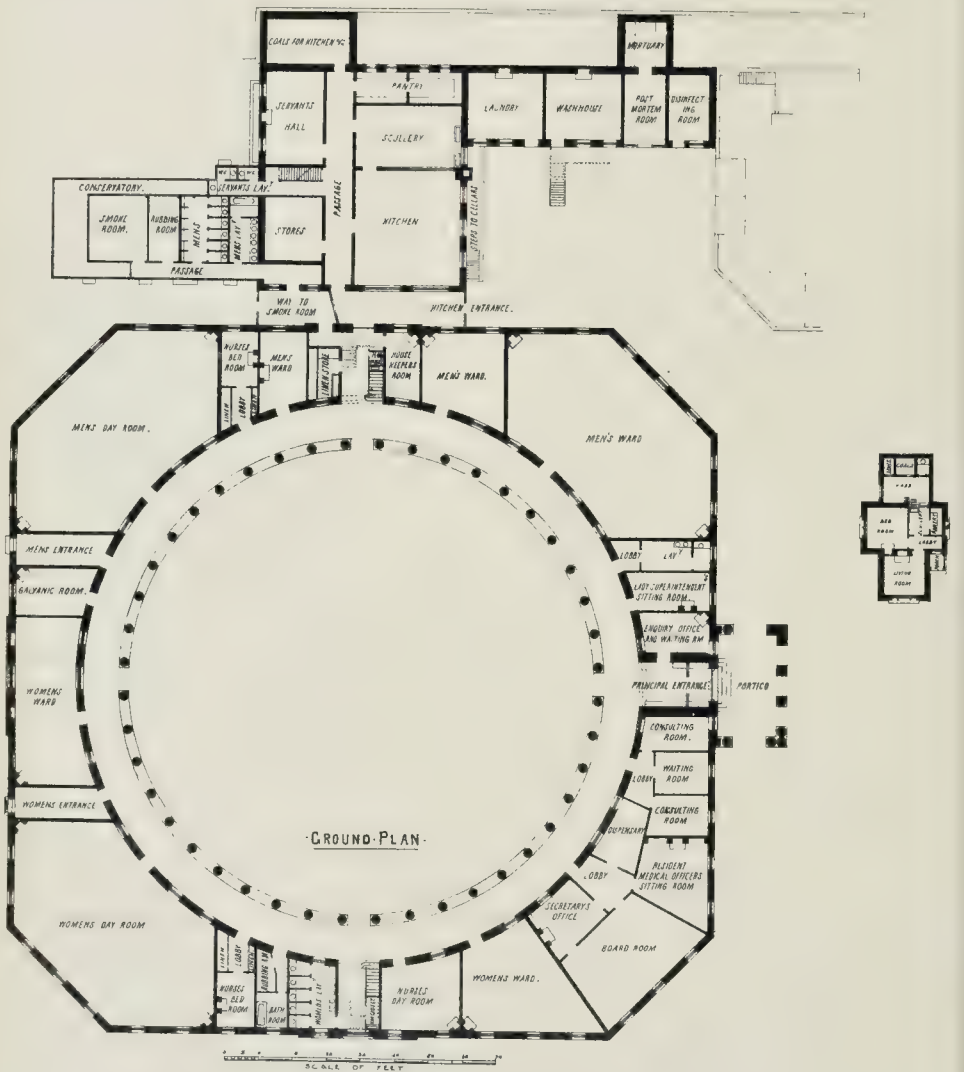
Block XXIV.—Messrs. J. C. Stark & Co., Torquay, show Stark's patent pure-air ventilating stove, and gas-heating and ventilating stoves. Messrs. John Wright & Co., of Birmingham, are also exhibitors of apparatus for cooking and heating by gas. Messrs. Lewis & Lewis, of Cambridge Heath-road, show a newly-invented gas-engine for small power. The executors of the late Mr. J. E. H. Andrew, of Stockport, show a two-man power "Bisschop" gas-engine. Messrs. Crossley Brothers, Limited show a 2-horse power "Otto" silent gas engine, intended to work with ordinary coal-gas, but here worked with the "Dowson Economic Gas."

Block XXV.—Messrs. George Wright & Co., of Rotherham and Queen Victoria-street, show their patent "Bi-valve" open fire-grates, fitted with, or adapted for, Dr. Siemens's gas and coke apparatus, securing economy of fuel and prevention of smoke without sacrificing the cheerful appearance of an open English fire-place. The same firm are exhibitors of their "Economic Cooker" (previously noticed by us with commendation) and of warm-air stoves. Their exhibit is a good one. The Dowson Economic Gas Company, whose product has already been mentioned, show their gas-producing apparatus at work.

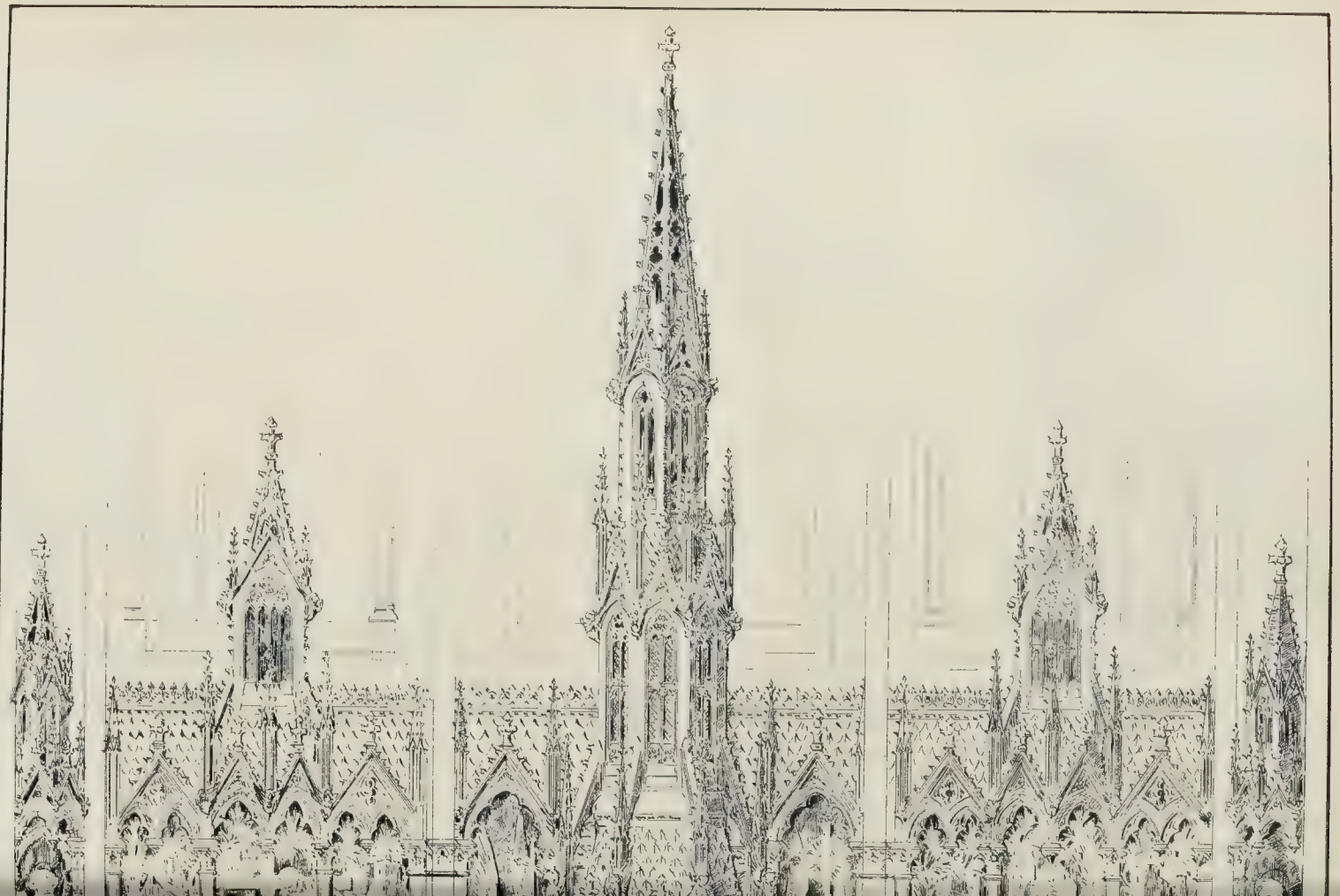
Block XXVI.—Mr. C. R. Stevens, of Lewisham, shows a steam and hot-air heater and a circulating hot-water apparatus. These appliances appear to give good results with a comparatively small consumption of gas, which is the fuel used. Messrs. W. Sugg & Co., of Westminster, show their specialities in the way of gas fittings and burners. Referring to gas-

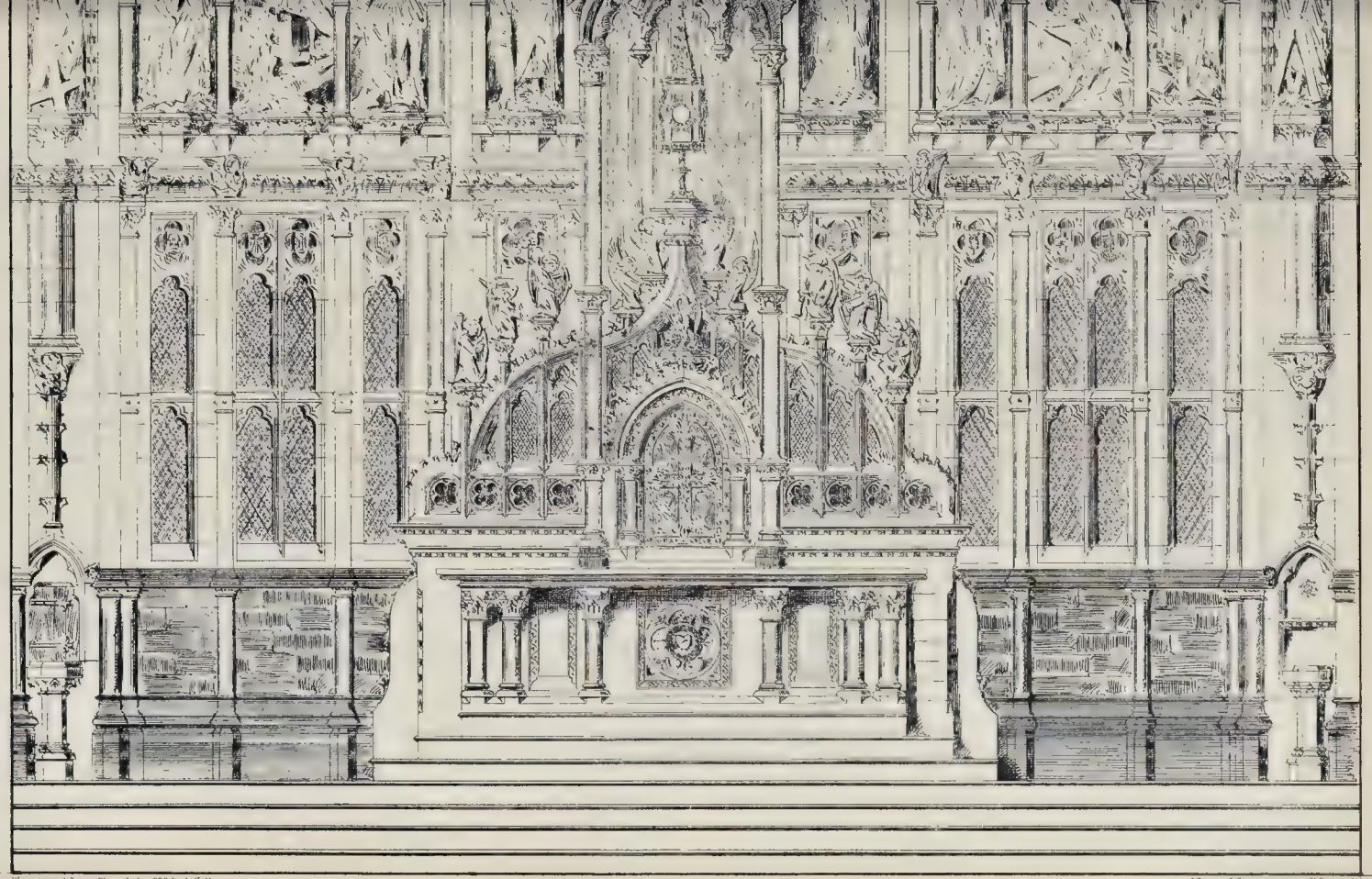


ELEVATION TOWARDS DEVONSHIRE ROAD



DEVONSHIRE HOSPITAL, BUXTON.—MR. ROBERT RIPPON DUKE, ARCHITECT.

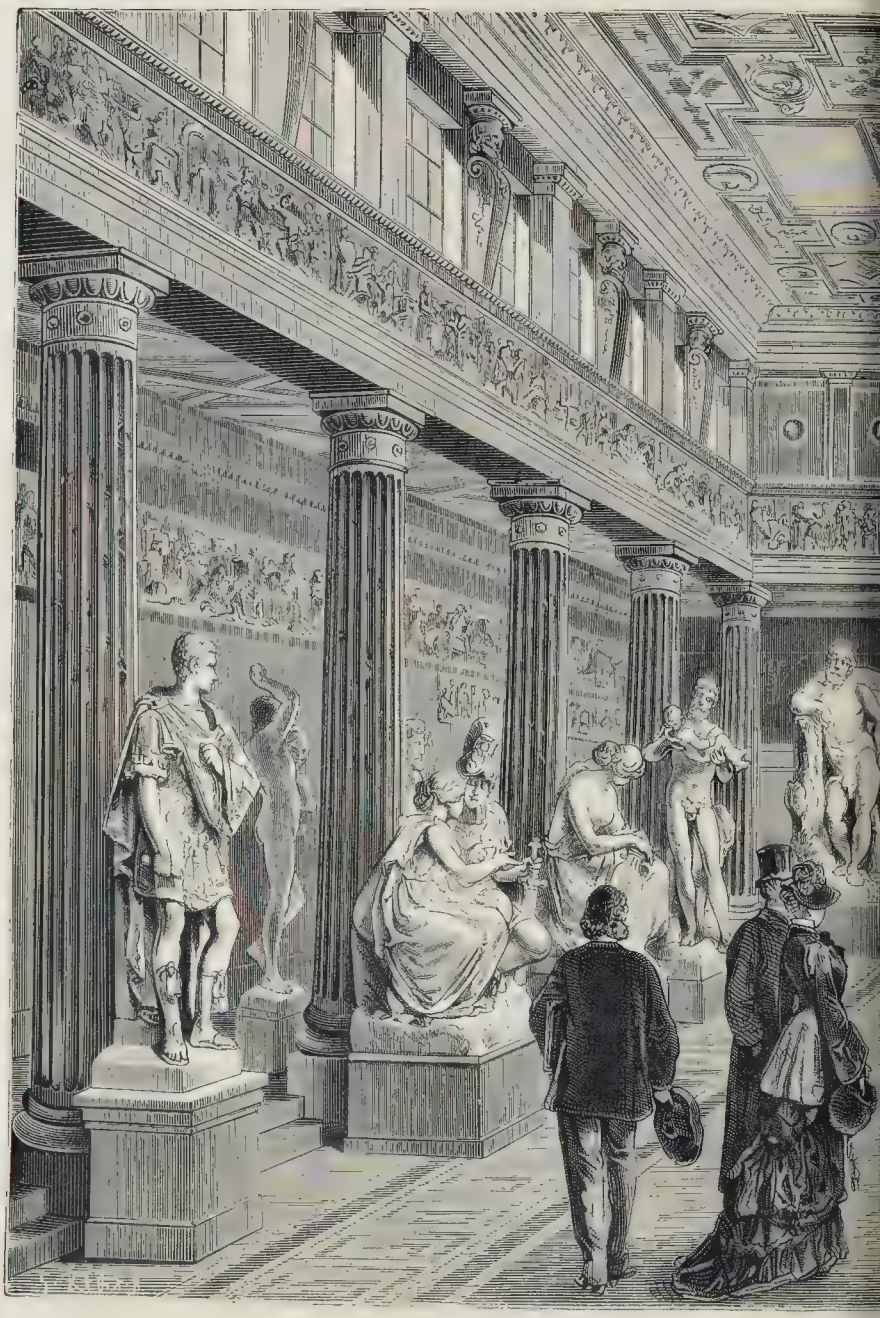




Whiteman & Bass *Photo-Litho* 236 High Holborn

Wyman & Sons printers 74 Great Queen St

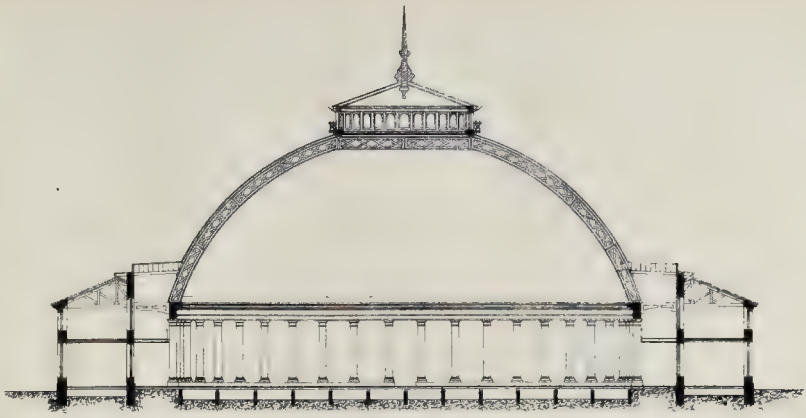
PROPOSED ALTAR AND REREDOS: R. C. CHURCH OF THE HOLY CROSS, LIVERPOOL.——MESSRS. PUGIN & PUGIN, ARCHITECTS.



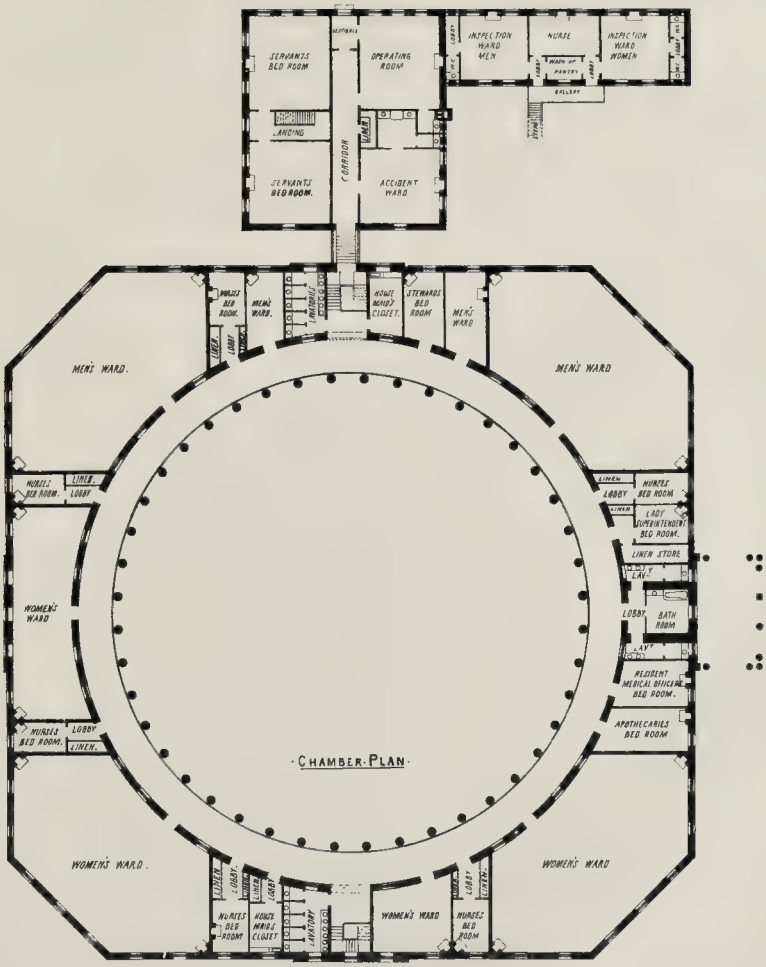
GALLERY OF CASTS: ACADE



HE PLASTIC ARTS, VIENNA.



SECTION.



Whiteman & Bass, *Photo-Litho* 236 High Holborn

Wyman & Sons, Printers, 6 Queen St

DEVONSHIRE HOSPITAL, BUXTON.

burners, we may mention that the conservatory is illuminated at night by Dr. Siemens's regenerative gas-burners. Messrs. H. & C. Davis & Co., of Camberwell, are large exhibitors of stoves and apparatus for cooking and heating by gas.

Block XXVII.—Among the most noticeable exhibits in this block are the coke and gas boilers, and heat-radiators, shown by Messrs. Hooking, Franklin, & Co. (Limited), Liverpool. Messrs. C. Kite & Co., of Chalton-street, exhibit smoke-preventing chimney-caps, ventilators, &c. Messrs. Henry Wurr & Co., of Blomfield-street, show the "Ord" patent gas-engine.

The objects which we have here and there selected for mention, though comparatively few in number, are fairly representative of the whole, and will serve to show how much is now being attempted and achieved in the way of economising fuel and preventing smoke.

We shall have something to say on the subject in our next.

GALLERY OF CASTS: ACADEMY OF THE PLASTIC ARTS, VIENNA.

ON the south side of the Schillerplatz, in Vienna, stands the noble building of the new Academy of the Plastic Arts, erected a few years ago, with profuse ornamentation in terra cotta. It comprises, amongst its treasures, on the ground-floor, a valuable collection of original specimens and casts from ancient and modern sculpture, and on the upper floor a valuable picture-gallery, illustrating almost all schools, and particularly the Dutch of the seventeenth century, also many examples of Raffaelle, Paul Veronese, Tintoretto, Titian, and other well-known masters.

The principal staircase leads to a spacious landing, supported on columns, and thence to the Aula, or Court, shown in our engraving, from which are entered seven large halls, filled with various art-works. The court illustrated has rows of columns at the sides supporting a clearstory, and a ceiling handsomely ornamented. It contains a fine collection of casts of the principal creations of classical sculpture.

The library, which adjoins it, contains books referring to plastic art, collections of engravings, and original sketches. The Academy comprises within its walls a school of painting and sculpture, as well as a special school in which are trained young men preparing to become engravers, medallists, and architects.

THE DEVONSHIRE HOSPITAL, BUXTON.

OUR readers will remember that the extension building for the Devonshire Hospital and Buxton Bath Charity, at Buxton, was lately opened by his Grace the Duke of Devonshire. We give plans and sections in our present number illustrating the construction and arrangement, which are noteworthy. The building has a somewhat imposing appearance externally. The outer form is an irregular octagon with an inner circular area 164 ft. in diameter. Within this area is a circle of columns 138 ft. diameter, forming a colonnade 13 ft. wide all round the inner space. These columns with their entablature rise 25 ft. above the floor; and from the entablature springs the dome covering the area. The dome is a segment of a sphere, the diameter of which is 156 ft. 6 in., and springs from the stone entablature of the circular colonnade, which consists of forty-four stone columns, 2 ft. 4 in. in diameter.

The main framework of the roof consists of twenty-two strong wrought-iron latticed ribs, each 4 ft. in depth throughout, which are equally spaced, and are secured at their upper and lower extremities into two complete rings of wrought-iron, which, together with eight rings or tiers of purline framing, combine to render the structure entirely self-contained, and effectively prevents any outward thrust upon the supports.

The lower ring or polygonal bracing rests horizontally on the stone entablature; each bay or space between the main ribs being composed of two wrought-iron plates, each 15 in. by $\frac{3}{4}$ in., interlacing each other at the centre; and the ends being strongly riveted to a third plate, which is combined with and forms part of the foot of the rib itself. The upper ring is vertical, 40 ft. in diameter, lattice-framed, and receives the ends of the converging main ribs between its upper and lower flanges.

The purline framing is of rolled girder iron, 8 in. by 5 in. by 5 in., and, in addition to its attachment direct to the main ribs at the upper surface, is braced diagonally thereto by means of T-iron, extending from the lower flange of ribs to a point on the purline 3 ft. 6 in. from its junction on the rib. This bracing also adds to the rigidity of the arched ribs.

There is also a framework of light rolled girder intermediate ribs, intersecting and attached to the several tiers of purlines, and to the upper central ring. Upon this upper ring, at a height of 76 ft. from the floor, are fixed the cast-iron pillars or supports of the lantern roof, which is 40 ft. in diameter, glazed at the top and sides, and formed of rolled iron ribs, radiating from a centre, and tied around their outer extremities by a ring of wrought-iron plates securely riveted, rendering unnecessary the use of any internal bracing.

A gallery surmounts the exterior at the summit of the dome and foot of the lantern, with suitable guard-railing, to which access is provided.

A Boyle's ventilator, of large power, is fixed on the apex, and there are louvres to all the sides of the ventilating lantern.

The superficial area of this hall is just half an acre, and it is capable of holding 6,000 people. Its cubic contents are about 1,000,000 ft. The heating of the wards, day-rooms, central hall, and building generally, is by hot-water pipes passing under the floor, and coils of pipes placed in the large wards and day-rooms, the smaller rooms, lavatories, &c., having pipes placed above the floor, and the hall having six rows of pipes around its whole circuit, four rows above the floor, and two rows under the gallery. The ventilation, in addition to that obtained through the windows, is supplied by 12-inch glazed earthenware pipes, starting from areas outside the building, passing under the floor, and having branches into each ward and round the colonnade, carried up 8 ft. above each floor level, in specially constructed wooden tubes. This description of the ventilation applies equally to the chamber-floor. In the centre of the roof of the lantern, as has been already mentioned, is a large Boyle's patent ventilator.

The principal entrance is on the east side of the building. On the left or south side of the entrance are the consulting-rooms, dispensary, resident medical officers' room, board-room, waiting-rooms, and secretary's office. On the right of the entrance are the inquiry office, waiting-room, master's and matron's official room, &c. The south side of the hospital contains females' ward, with 899 superficial feet area, nurses' day-room, main staircase in stone, lavatories, &c., bath and rubbing-room, nurses' bedroom and linen-store, and females' ward, containing an area of 2,551 superficial feet. This latter room forms the south-west angle of the building. The west side of the hospital contains females' ward, with 940 ft. superficial area, galvanic room, and separate entrances for males and females. The north-west angle of the building is used as a men's day-room, and has an area of 2,251 superficial feet; the north-east angle is occupied by a men's ward, having an area of 2,251 superficial feet. The north side of the hospital is occupied by two men's wards, having areas of 552 ft. and 294 ft. superficial respectively, a housekeeper's room, linen-stores, nurses' bedroom, and main staircase in stone. Passing under this staircase a covered way leads to men's lavatories, &c., rubbing-room, smoke-room, and conservatory. These rooms are detached from the main building. The covered way in question and a corresponding staircase lead to the different floors of a large block of building, entirely detached from the main building of the hospital, and with separate arrangements, containing ample cellarages, warming apparatus, kitchens, laundries, &c., and also distinct and separate accommodation for accident cases, with independent and easy access, and wards for the isolation of cases of infectious character that may have been inadvertently admitted, or may have manifested themselves as such after admission. The disposition of the wards on the chamber floor is similar to that on the ground-floor. At the south-east and south-west angles of the building are the females' wards, and at the north-east and north-west angles are the men's wards. These rooms contain each an area of 2,251 superficial feet, and are rendered especially light, and their cubic capacity is increased by the open-roof principle of finishing the interior, that is, plastering close under the slates, and thus getting into the room the triangular space enclosed by the usual ceiling and roof. Advantage is also taken of the four angle turrets on the roof to get additional light and ventilation into these wards. The access to all the wards is from the inner circle; on the ground-floor, from the central hall; on the chamber-floor, from a fireproof gallery.

On the east side of the chamber-floor are the bedrooms for the matron, the steward, the resident medical officers, &c., and also bath-rooms, lavatories, &c. On the south side is a females' ward, with 480 ft. area, nurses' bedrooms, linen rooms, lavatories, &c. On the west side is one females' ward, 940 ft. in area, with bedrooms for nurses, &c. On the north side are two wards for men, 252 ft. and 312 ft. respectively, and other bedrooms for officials and nurses. The original buildings cover half an acre of ground, which surrounds the half acre of the covered central hall; the new buildings cover one quarter of an acre, so that the hospital buildings now cover one acre and a quarter, in addition to the surrounding roads, yards, paths, terraces, borders, and shubberies, by which the hospital is entirely isolated. There are broad terraces and terrace walks on the south, in addition to the walks around the shubberies, for the use and recreation of the patients. These grounds, with the one acre and a quarter covered by the hospital buildings, comprise a total area of nearly three acres and a quarter. The extension has been carried out at a cost of 24,000*l.*, from the plans and under the superintendence of the architect, Mr. R. Rippon Duke. Messrs. Rankin & Co., of Liverpool, have done the ironwork. The roof is so stiff that it did not deflect $\frac{1}{4}$ in. after being covered with the timber, slating, lead, glass, ceilings, &c. Messrs. Ellis, of Sheffield, have carried out the hot-water arrangements. These works are complete and most satisfactory. All other trades are by Mr. Warburton, of Manchester, whose work is not quite completed.

REREDOS FOR THE (R. C.) CHURCH OF THE HOLY CROSS, LIVERPOOL.

IT is contemplated to erect at once an altar and reredos for the Church of the Holy Cross, Liverpool, the design for which will be found amongst our illustrations. The chancel is apsidal in form. The high altar and centre canopy will stand quite clear, to admit of sufficient space for steps behind to approach the throne. The altar and canopy will be of alabaster, the altar itself being supported by marble shafts. The shafts of the canopy will be of granite.

Running round the apse immediately under the sills of the windows is the reredos, which will be of Caen stone, and filled with subjects connected with the Holy Cross. On the dexter side next to the canopy will be St. Michael the Archangel bearing his own cross on his shield and another in his hand. Next to that will be the Descent from the Cross. In the niche on the same side will be St. Peter with his cross. On the sinister side there will be the Angel of the Apocalypse bearing the sign of the living God. The next group is the finding of the cross by St. Helen, and the miracle by which the true cross was distinguished from those of the two thieves. In the niche on this side is the figure of St. Andrew with his cross *saltire*. In the space under the reredos will be the panels filled in with diapers picked out with gold. In the quatrefoil in the top of each panel there is a shield, on which will be carved the emblems of the Passion. Below these panels will be a dado of dark marble. The steps of the altar will be of rouge royal of a dark tone. The cost is estimated at about 1,350*l.* It has been designed and will be carried out under the superintendence of Messrs. Pugin & Pugin, of Westminster.

Alhambra Theatre.—After being closed for several weeks for redecoration and to undergo some structural alterations, the Alhambra Theatre will be re-opened this Saturday, December 3rd, with an English Version of *La Biche au Bois*, under the title of the "Black Crook." The Lord Chamberlain having required the directors of the Alhambra to make a fireproof division between the stage and the auditorium, advantage has been taken to make various improvements in the theatre, not the least of which is a widening of the proscenium, and a raising of the seats on the ground floor, by means of which a much better view of the stage is obtained. The dome is to be illuminated by the electric light, the effect of which we will report.

MANCHESTER AND ITS TRADE.

"At social industry's command, how quick, how vast an increase!"

That expression of Wordsworth's, and his description of the huge town, "continuous and compact," may be said to have special application to Manchester. It has the germ of the small hamlet the poet speaks of, though distant in age, but from the building of its collegiate church, from the establishment of schools, it grew slowly, while an increased commerce, as it was made possible by free transit, gave impetus to it. The Manchester of to-day has little or no likeness to that to which the Flemish artisans came five centuries ago to bring woollen manufactures to perfection. It is, indeed, within the last hundred years that cotton has become king of commerce in Manchester, and has made the city great. The power-looms and the inventions of Hargreaves, Arkwright, Crompton, and Watt are the sources of that centreing of trade on the Irwell which has made the place continuous and compact, and which gives to it its life-blood of progress. If even we glance at the condition of Manchester five decades ago, and contrast it with the present, we shall see how in the later years the progress has been most marked. It had then the large population of 187,000 inhabitants, or with out-townships and Salford, 279,000. It was governed by a borough reeve and two constables, and Salford was similarly held in ancient thrall. It was sparsely provided with public buildings,—the Exchange of 1809 was then one of the chief; the old town-hall in King-street was in course of erection. It had a score of churches, and Christ Church was approaching completion; whilst there were more than double that number of Dissenting places of worship. Infirmaries were numerous, public charities many. Its trade was indicated by the fact that it had 20,000 steam looms in the parish. Its general post-office in the Exchange Buildings had six receiving-houses connected with it; there were seven general deliveries. In an old directory of a year or two later, the names of nearly a thousand manufacturers attending its market were given, ten coaches to London ran, and others to all parts of the kingdom, whilst carriers by land and water were almost countless. There were conveyances by railway,—"seven times a day (Sundays excepted) to Liverpool," "first-class trains," four in number; "second-class trains," three. And it is worthy of note that "omnibuses for the conveyance of passengers by the first-class carriages" left the offices in Market-street "twenty minutes before the carriages leave the Liverpool-road Station." There was a literary and philosophical society in those days at 40, George-street,—"John Dalton, esq., D.C.L.," being the president. The Mechanics' Institute existed in Cooper-street; there were barracks for 55 officers and 1,099 men; Cheetham's College Library was in Hunt's Bank; the Tax-office was in Tib-lane, the waterworks office in Piccadilly, the two theatres were in Fountain-street and Spring-gardens. In a sentence, Manchester in those days was the unfilled outline of that great city that we now know.

It is during the greater part of the last fifty years that Manchester has known its growth,—its benefits from the railway system having been great. Records of the growth are to be found in the recognisation by Parliament of its importance at the time of the first Reform Bill; of its incorporation; of its creation into the see of a bishop; of its being the centre of the operations of the Anti-Corn Law League; and of its being the scene of the opening of that Arts Treasures Exhibition that has had no compeer. Its architecture has been improved by the building of stately palaces such as the Assize Courts, and by the removal of some of the worst of its insanitary streets; the town has had the benefit of the formation of grand free libraries, and of magnificent parks, and it has felt the impetus of these changes and of these improvements, so that it is widely different from that of fifty years ago. It has much to do yet before it becomes a model town. In the last two decades much has been done to ornament the city with stately abodes of justice, religion, trade, commerce, and local government. The Assize Courts that make Strangeways dull by contrast with their Gothic grandeur, have been built at a cost of about 100,000*l.*, whilst for a very different use the fine new town-hall has been completed, also at an immense cost; and the Queen's Theatre, the Memorial Hall, and the Assembly-rooms, have been added to the stately structures of the city in the period we have named. Statues have been added, parks completed, great gardens designed, grammar-schools built, and many of the gigantic warehouses of the city erected in the time. The churches and chapels have been increased till they now number about 200, the greater part of them the temples of various shades of Nonconformity, and many of those, of all denominations, stately structures, whilst there is continually in progress an addition to the number, and from the Greek Church to the Quakers, from the Jews to the Moravians, it would seem that every form of faith finds its fitting tabernacle in the great city. With a population that has in its Parliamentary bounds grown to 393,676, it is to be expected that both in the provision for its religious, social, and educational needs there would be required a supply on a scale of magnitude, and this has been found. The local governors of the past in Manchester took an exalted view of the needs of their city, and they endeavoured to bring it up in some things to their ideal. They bought up gas and waterworks, and speedily had from the first a profit of 1,000*l.* a week. They extended the waterworks at Woodhead until their capacity was enormously increased; then the reservoirs, such as Prestwich, were commenced; and finally the Corporation has decided to go far into lakeland to find an adequate supply of water for its needs. Sewerage was laid down by the mile, streets were paved by the score, cellars were closed, and some of the worst of the streets were razed bodily and air-courses run through. Latterly it can scarcely be said that the great efforts that were made at improvement have been continued on so large a scale,—by the Corporation, that is; but some of the great companies have taken an adequate view of the necessities of Manchester, and the provision that has been made at the central station is worthy of the city, and would put to shame that of the older railway efforts if it were not that at Victoria extensions of no mean order are in progress, one railway company alone (the London and North-Western) having for some time spent over 20,000*l.* monthly in the efforts to meet the needs of the city of Manchester for passenger accommodation. That city has grown so great, indeed, that it may be said to be one of the wonders of the country, and though the rate of its progress has been checked, it is but the check that precedes the further growth. It is not needful to give figures to trace its further progress, they are to be found readily in the number of its electors, the area of its borough, the extent of its rateability. It has its criminality, as the 9,000 or 10,000 yearly drunkards attest; whilst 480 public-houses and nearly 2,000 beerhouses should supply the needs of its citizens, and may aid in the needs that require over 800 policemen. In all the essentials of town life, as well as in what must be considered the inevitable, if saddening, accompaniments, Manchester has its full share; but it is to the credit of its people that in stately parks, in noble libraries, and in other ways, it has sought to give compensating recreation to its vast population.

As to the trade of Manchester, it must be said that the vast growth of the past was for years extended and increased when the railway system gave facility of transit, and when its sister, the steamship, gave cheap and rapid sea carriage. For years that great trade in which Manchester is king grew, and others grew with it. Not alone is Manchester at the head of the cotton trade, but many of the textile trades are domiciled in it or in its neighbourhood, and all contribute to its progress in industry. To textile fabrics it has added vast machine-shops, and it is said that there are in it nearly a thousand varieties of occupations, from the cotton-spinner to the enginewright, and from the paper-stainer to the umbrella-maker. A glance at some of its great streets is like that into a fair, and from all these varieties of industry Manchester takes toll, and continues to prosper. It has had its periods of dulness in the great industries to which the others are contributory, or which they depend on, and it finds an increasing rivalry in these, not only at home, but abroad. But the true Manchester man finds in competition a stimulus, and so in that great industry to which he is so largely devoted it has in the past proved, and may do so in the future. At the same time, it is to be held in remembrance that Manchester has to meet a fiercer competition, and one that in some parts of the Continent shelters itself cowardly behind heavy duties. It has also here to meet a state of affairs where taxation is heavier perhaps than in any country; and it is probable that this is a feature of the international competition that our traders have hitherto not sufficiently taken into account, but which they will in the early future have to endeavour to lessen as much as possible. Manchester has felt this especially, locally and nationally, and it has had of necessity slightly to relax its efforts in local improvements on this account. But it will again begin to attack some of the causes that led to its having too high a death-rate: it will have to take advantage of some of the efforts that its railways are making, and to pull down some of the unsanitary and unsightly dwellings that are to be found in the heart of the city; and it will have to complete the task of providing a full supply of the purest water. Its trade will grow as the competition that it has to meet is overcome by cheapened products and increased superiority of production, and especially as it fits itself to supply to newer markets in other lands the materials they need. The opening up of new markets in Africa, in parts of the great East, and in our colonies, is one of the needs of the trades of Manchester; but the men to whom British commerce owes so much should be able to overcome the little difficulties in their way, and should give by these means an impetus to endeavours which should be sufficient to make the trade of their city grow in the future more rapidly even than in its glorious past.

THE NEW PUBLIC OFFICES AND PIETRA DURA ARCHITECTURE.

Sir,—The urgent practical remarks in the *Builder* of last Saturday in reference to the sound construction,—especially from a sanitary point of view,—of these buildings, are not made a moment too soon, and if carried out,—as, indeed, they must be,—the large class of persons interested, and whose health, if not life, is concerned, will be deeply indebted to you.

There is another practical matter which, although it is not of such immediate importance, will, nevertheless, call for serious consideration at no distant date.

When, in 1872, the designs for the Royal Courts of Justice were being discussed, the "battle of the sites," the "battle of the styles," the "battle of the architects" were the themes on which the writers in the daily papers exercised themselves; but we looked in vain for a word to indicate that any combatant in the arena had devoted one thought to the question of at least equal, if not greater, importance to them all,—that between preservation and perishableness, form and chaos, beauty and decay. Now, again, in this year of grace 1881, the war clarion has sounded, and it is satisfactory to hear the notes dwell on a subject of useful and practical importance. The leading journal says, "What will be the fate of its exterior carvings and frettings after another fifty years of London smoke all of us can tell. The same may be said of a thousand other buildings, great and small, that the past generation of Londoners has raised as monuments of its own ignorance of the simplest conditions of good building. . . . . They crowd their fronts with carvings of flowers and fruit, which in a year the soot will blacken past recovery, and in five years corrode beyond recall. It is not in work of this kind, we may fairly believe, that the public money is to be spent in the case of the new offices."

This is strong language; but when we see important and costly edifices restored in the lifetime of the architects who designed them, and palaces patched with cement and painted over every three or four years, before their builders have passed away, what professional man can say that they are too severe, or that they exaggerate the facts?

Against the repetition of these evils,—of such a catastrophe,—what effort can be too great, what measure of defence too costly or too troublesome? It is a point of honour that we have to fight for, and if defeated we are irretrievably disgraced. Hundreds of thousands of pounds sterling are annually expended in saturating wood with creosote, and coating iron with zinc and tin, to secure the durability of various national structures,—ships, harbours, &c.,—but no remedy has been found for the decay of soft calcareous stone in our smoky cities; and yet, in our childish helplessness, we continue to use it daily and year by year

as if we had had no warnings of the folly of doing so.

As you have before allowed me to urge, the only remedy is to be found in the use of the igneous rocks,—granites of various kinds and colours, and the serpentines and basalt, polished so as to exhibit their characteristic beauty, for the general surface, with, in some cases, majolica encaustic tiles and faïence for details. Nothing but the element of fire, natural or applied, gives the requisite power to materials to withstand the powerful and destructive effects of the sulphurous acid and other gases of the London atmosphere.

The invention of the requisite machinery, the extension of railways into the very heart of the inland granite quarries, and low freightage by ship from those on the seaboard, have wonderfully reduced labour and prime cost to that of the best ordinary stone in London. The actual cost of putting a perfectly fair surface on roughly scabbled granite, as delivered from the quarry, is only 7d. per foot super., and 120 ft. can be dressed per diem. By manual labour a foot costs 2s. 6d. The result, therefore, is, that while a day's work with one machine costs 3l. 10s., the same work would occupy a man forty days at a cost of 15l.

Messrs. Mortal, Magué, & Co. report that it takes a man five days to do the work one machine performs in three hours; and the patentees claim that, with proper arrangements of overhead travellers and cranes for rapidly picking up and removing the blocks, one machine will do the work of about forty masons: that the running cost, including power, wages, grinding cutters, interest, and depreciation, is equivalent to the wages of about eight men, showing a saving equal to the pay of thirty-two masons. Lathes, by some patentees, for turning columns, do the work of from ten to fourteen men at the cost of two or three. There is another advantage not to be despised,—machines do not strike.

Polishing granite is an exceedingly cheap process, one or two boys only being required to apply sand, emery, and putty-powder, to a wagon slowly travelling under rapidly revolving rubbers, both worked by steam-power.

The question is, how to secure the benefit of all this for important architectural works in London?

A short time since the writer tried to form a company for the special purpose, and all promised well for success till it was converted into a purely engineering concern for dock and harbour work, to suit the financial ideas of one or two commercial men, who, in the course of formation, became connected with it. But if the proposal would really confer the economical benefits upon the public which is claimed for it, is it not incumbent, and would it not be an honourable proceeding on the part of the leading members of the profession, to form a deputation to the First Commissioner of Works and Public Buildings, and, after laying before him proofs of the futility of any longer persisting in the use of perishable stone, request that a stipulation should be inserted in the conditions to architects invited to send in designs for the intended Public Offices, requiring the exterior to be constructed of the various polished granites, basalt, and serpentine, from quarries in the United Kingdom? By this means not only would all competitors be placed on the same footing, but when the accepted plans were determined upon, and the tenders called for, the granite dealers would find themselves in competition for a noble work, and the utmost economy would doubtless be the result.

With simple and appropriate treatment of the materials,—flat geometric ornamentation in the different and almost unlimited colours obtainable; no mouldings, but only splays; no projecting carvings, but only superficial scrollwork upon dead grounds, which, at option, and for greater richness, might be gilded,—it is more than probable that no additional cost over and above carved and moulded stonework would be incurred.

As a retired architect, I shall, I trust, be pardoned by the profession for going into these details,—the result of a good deal of study,—as it is obviously necessary to do so, but nothing would give me more pleasure than to see some better proposal to meet what is very generally, if not universally, admitted by architects to be an urgent want, and by the taxpaying public a crying evil.

H. TRAVIS.

SKEGNESS BATHS COMPETITION.

AT a meeting of the directors of the Skegness Swimming, Hot, Cold, and Turkish Baths Company held on the 22nd November last, it was decided to adopt the design sent in under the motto "Convenience with Economy"; the author of which, Mr. James Whitton, of the city of Lincoln, was commissioned to carry out the work; the second premium being awarded to Mr. H. A. Goodall, of Nottingham. Seven designs were sent in. The buildings will be commenced at once; the baths will be supplied with sea-water. The materials to be used are red bricks for all walls, stone being slightly used in the fronts. The swimming-baths will have iron roofs, covered with galvanised corrugated iron.

THE MAIN DRAINAGE OUTFALLS AND THE CONDITION OF THE THAMES.

AT the meeting of the Metropolitan Board of Works on the 25th ult., the Works Committee presented a report recommending the enlargement of the reservoirs at the Crossness Pumping Station and Barking Outfall Works, at an estimated cost of 160,000*l*., and that the Engineer be instructed to prepare contract drawings accordingly; and that it be referred to the Finance Committee to see that proper provision is made in the Board's Money Bill of next session for meeting the expenditure upon these works. The report was adopted.

The same committee, reporting on the letter from the Local Government Board, transmitting a copy of a letter from the vestry of Plumstead with reference to alleged pollution of the Thames by sewage from works executed under the Metropolis Local Management Acts, recommended that a reply be sent to such letter in accordance with a report made by the Engineer and the Consulting Chemist.

On the motion that this recommendation be adopted, Mr. Jolley, as representing Woolwich, demurred to the accuracy of the statements contained in the report referred to, observing that at certain states of the tide the Thames at Woolwich was no better than a common sewer.

Mr. Richardson denied this, and the recommendation was adopted.

Mr. Richardson and the majority of the Board notwithstanding, the condition of the Thames, in consequence of its being made the receptacle for the sewage of London, is, as we have often pointed out, very unsatisfactory, and we note that the question of seeing what can be done to purify and keep clean the river has been referred by the Corporation to one of its committees, viz., the Port Sanitary. This committee, having given the subject their best consideration, appointed a sub-committee, with instructions to ascertain the exact state and condition of the water of the river. The sub-committee, after conference with their medical officer, decided to go on with their inquiries at once, so that it should not be said that an exceptionally unfavourable period of the year was chosen, and proceeded to Tilbury on Wednesday in last week, on a visit of inspection. Upon arriving at Tilbury by train, the sub-committee boarded their steamer, and it being just after the ebb-tide had turned, the steamer at once started from Tilbury in the direction of London. Samples of the water were taken off Gravesend, Greenhithe, Erith, and various places near to where the trainingships are moored, most especially at the great outfalls near Crossness and Barking Creek, and also at several points between Barking and Blackwall. Feeling satisfied that, as the result of their efforts, they had obtained fair samples of the water in various parts of the river, the bottles containing the fluid were at once sealed up, and each one numbered in the presence of the committee-men. Several of these samples, the *City Press* states, are, by resolution of the sub-committee, to be submitted for analysis. When it is borne in mind that the estimate, based upon data derived from the best sources, is that the daily average number of persons engaged on craft, small and great, on the river, amounts to 20,000, it will at once be seen that they alone must necessarily pollute the river to a considerable extent. But when we hear that between Teddington and Gravesend there are nearly 400 open outfalls (large and small) it will be seen how important is the work the Corporation have undertaken. Of course, many of the outfalls in question are small and insignificant, but in the aggregate they are considerable, and seriously pollute the river. The greatest source from which the foul matter comes are doubtles the outfalls from the docks and the metropolitan drainage at Crossness and Barking Creek.

THE PROPOSED AMENDMENT OF THE BUILDING ACT.

AT the meeting of the Metropolitan Board of Works, on the 25th ult., it was announced that a letter had been received from Mr. C. Fowler, on behalf of the District Surveyors' Association, requesting to be favoured with a copy of the draft Bill for amending the Metropolitan Building Act, which the Board propose to submit to Parliament in the ensuing session, as the district surveyors are desirous of suggesting one or two important amendments. The letter was referred to the Building Act Committee.

In the public notice which has been given by the Board of their intention to apply for an amendment of the Acts relating to buildings and streets in the metropolis, the following objects are mentioned among those for which powers are sought:—

To confer on the Board further powers as to streets and buildings in the metropolis.

To enable the Board to attach to licences granted by them for buildings of a temporary character conditions as to the term for which such licences shall endure, and to provide for the removal of the building to which such licence relates at the expiration of the term for which the licence was granted, or to impose penalties in cases where the terms and conditions of any such licence are disregarded.

To alter and increase the dimensions of which the Board may authorise the construction of buildings without being divided by party-wall or party structures.

To enable the Board, as well as any vestry or district board, to exercise or put into force the powers conferred by Section 75 of the Metropolis Management Amendment Act, 1862, upon vestries and district boards in the case of buildings erected without the consent of the Board beyond the general line of buildings, and to enable the Board to proceed under the said section to obtain and enforce orders for the removal of buildings so erected, and for the recovery of expenses incurred in carrying out such orders.

To enable the Board to attach and enforce conditions in cases where building beyond the regular line of buildings is permitted, and particularly a condition that any land or space in front of the regular line of building shall be dedicated to or left open for public use.

To control and regulate the alteration of dwelling-houses or other buildings into public buildings, as defined by the Metropolitan Building Act, 1855, or to prohibit the alteration of such dwelling-houses or buildings into public buildings.

To enable the Board to pull down, remove, or alter ruinous or dilapidated buildings, or buildings declared by the order of a magistrate to be a nuisance, and to charge the expense thereof upon the property, and to enable the Board to recover the same, or to require the owner of such buildings to pull down, remove, or alter the same, and to provide for the making, by a magistrate, of orders relating thereto, and to authorise and provide for the recording and registration of any such charge.

To confer on the Board powers as to the removal and pulling down of irregular buildings and structures.

To prohibit or regulate the use or construction of wooden and other structures of a movable or temporary character, timber stages, stacks of timber and wood, and other similar erections, and to enable the Board to license, control, and regulate the same.

To prohibit, during such period as the Bill may define, the locking or fastening of doors, and other means of exit at theatres, music-halls, and places of public resort or entertainment, and to require sufficient notice to be set up in such theatres, music-halls, and places as to the means of exit, and to provide for the inspection of such places, and the enforcement of the requirements of the Board.

To remove or alter existing restrictions as to the distance at which hot-water pipes in buildings shall be placed from combustible materials.

To alter and amend Section 29 of the Metropolitan Building Act, 1855, and to make further provision as to the space to be left in the rear or at the side of houses, and to require an open space to be left between houses built back to back.

To make further provisions as to the projection of cornices of shop-fronts, and to prevent and remove projections.

To make further provisions as to the appointment of an umpire or arbitrator for the settlement of differences between building owners and adjoining owners, as defined by the Metropolitan Building Act, 1855, Part 3 (relating to party structures); or between the owners of adjoining buildings where the owner of one building desires to execute any work which may affect the adjoining buildings, and to confer upon the umpire or arbitrator so appointed the necessary powers for the settlement of such differences.

To enlarge the powers of the Board for directing and enforcing the alteration of the naming and numbering of streets; for preventing the narrowing or obstruction of streets or thoroughfares by posts or otherwise, and for removing any such obstructions.

To amend the provisions of the said Acts with regard to the laying out of streets, and to confer upon the Board further control over new streets, the mode and direction in which they shall be laid out, and as to openings in the same, and to prevent such streets being laid out or made otherwise than in accordance with the directions of the Board.

To amend and extend the powers of the Board relating to dangerous structures within the metropolis, and to confer on the Board further powers for the recovery by them of the expenses incurred in connexion with dangerous structures, and to provide for charging such expenses upon the structures or sites thereof, and for prohibiting any building upon such site until such expenses have been paid, and if need be to authorise and provide for the recording and registration of such charges.

THE METROPOLITAN BUILDINGS ACT.

CAVITY WALLS, ETC.

Sir,—Since it has been announced that the Metropolitan Board of Works contemplate applying for a new Act of Parliament to regulate buildings in the metropolis, with a view, I hope, to embody therein provisions for the many new requirements of the age and to correct the many anomalies of the existing Acts, I wish to draw attention to the question of cavity walls. It has always seemed to me to be a very great anomaly in the present law that a party-wall may be, and often is, built almost wholly composed of flues, and thus practically a cavity-wall with two half-brick enclosing walls and a 9-in. cavity (as a two-brick wall) divided in its length every 14 in. or so by only half-brick wythes, whereas an external wall composed of a brick and a half-brick wall, securely bonded together, having a 2½-in. cavity between them, is not allowed, where a brick and half wall is prescribed, although the Act allows half the surface of the wall to be recessed and only one brick thick, but, to comply with the Act, the cavity and enclosing wall must be added in excess of the thickness. The desirableness of cavity-walls for imperviousness to weather and atmospheric influences no one will deny, but their adoption is thus rendered prohibitive on the score of expense and loss of space. Surely there is more danger from fire in cavity party-walls, even where the flues are well pargetted, than there would be in cavity external walls, and if the pargetting is so great a security in the one case, why not apply it to the other also? Then, on the score of strength, surely a wall built with a cavity of 2½ in., the enclosing 9-in. and 4½-in. walls being well bonded together, is as strong, if not stronger, than an ordinary brick and half wall, and most certainly sounder and stronger than the 18 in. wall with a 9-in. cavity of flues.

Considering the humidity of our atmosphere and the porous nature of the bricks commonly used, it is not surprising to hear so many and frequent complaints of the dampness of our houses; and this leads me to think that, instead of the Act being prohibitive, it should enforce the adoption of cavity enclosing walls in all cases.

I think revision is also very necessary in Part I., section xiv., of the Building Act. For my part, I never could see the reason for setting external woodwork, such as window and door frames, 4½ in. in reveal; it is surely absurd to say that this affords any security from fire, or why should shop-fronts be allowed? And it, no doubt, originated in the classical tendency of the period when the Act was framed. There is an anomaly, again, in this; for although sashes and frames have to be set in reveal, wooden blind-cases, even projecting beyond the face, can be fixed with impunity. I, therefore, cannot see why the restriction should exist, as it to a great extent cripples freedom of design in these enlightened days of art.

I am induced to send you these few remarks, which, if you favour by insertion, will, I hope, call forth the favourable opinion of the profession, and lead to full consideration by the framers of the new Act.

Thomas Harris, F.R.I.B.A.

ARTISTS' ASSISTANTS.

To what extent may artists avail themselves of the talents of other artists in carrying out their works, without laying themselves open to the charge of imposture? This question will, in all probability, have to be legally decided. It is a question, however, less easy of solution than one would at first imagine. In this country it is chiefly by portrait-painters and portrait-sculptors that assistants are employed, for excess of commissions in these specialities falls to a few fashionable favourites.

When mural painting was at its height in Italy, the institution of scholarships was necessitated; for it would otherwise have been impossible for the great painters to have carried out their various series of works. Highly skilled assistance was imperatively necessary, and it is well known that many of Raffaelle's scholars, also eminent painters, assisted him in carrying out his great works. Michelangelo, alone, persisted in carrying out, unaided, his mighty performances in painting and in sculpture.

Till comparatively recently the position of the fine arts in this country was very unstable, partly on account of defective art-educational means, partly on account of the scarcity of public employment for artists, and partly on account of the crass ignorance of all classes of the principles and practice of art. There was Flaxman, self-educated, on the intellectual side of art, but deficient,—exceedingly deficient,—in the *technique* of his art, who was obliged to have recourse to skilled assistance. There was Chantrey, with a mind above wood-carving, who was gradually inducted into the profession of sculpture, on account of his skill in making busts, and without ever having had any thorough and systematic education as an artist, obliged to seek aid from designers, as well as technically-skilled assistants. It is known that the two sleeping children in Litchfield Cathedral, which made his reputation, were designed by Stothard. There was Behnes, who could model a bust and carve splendidly, who was nowhere in regard to composition. The public are in that utter darkness with regard to art-matters that they fancy that any one who may be at all skilled in some art speciality is capable of any art achievement,—is, in fact, a great artist. It is they, the public, who are to blame for forcing men into positions in art for which, as artists, they are not competent. And if men are so forced, what is to be done by these recipients of adulations and favours but to endeavour by hired talent to support the dignity of the positions into which, *nolens volens*, they have been thrust? And, after all, this is nothing more nor less than assuming the position of the manufacturer who employs skilled labour; the proprietor furnishing the capital and courting a demand, whilst the skilled servitors employed enable him to furnish the supply. Whether this be legitimate or not, there can, we think, be but one opinion, that it is highly reprehensible that one who has accepted pay as servitor should be permitted to hold his talent *in terrorem* over his employer. We may have our own private opinion of the merits of the head of an art-manufacturing establishment, as an artist, but this is quite another matter.

Looking at the question, however, from a purely artistic point of view, let us see if we can formulate any definition of the line which should be drawn in the employment of other talent than the artist's own, in carrying out his works, which is discreditable to him. In the case of Raffaelle there can be but one opinion, that his was the master-mind, and that he was fully capable, unaided, of carrying out any of the great works that were produced under his direction by thoroughly educated assistants. Flaxman's case is somewhat different: if he had had to carry out, unaided, his own beautiful designs, they would have been considerably marred by his want of technical skill, yet not one of his assistants could have executed works comparable with Flaxman's with any other aid but his. Chantrey's position in respect to this question is somewhat different still, for he had considerable technical knowledge, and was a bold and facile modeller, but Chantrey was no designer. In this case the question seems to be balanced, Chantrey could not have produced the work in Lichfield Cathedral without Stothard's aid, nor Stothard without Chantrey's. It would appear, therefore, from the foregoing instances, that when a work is indebted *for its merits* to the assistance of an artist of greater mastery than his whose name it bears, his artistic reputation must suffer if the fact becomes known.

CLERKS OF WORKS AND FOREMEN.

Sir,—While architects have two societies in London alone, and, if I remember correctly, fifteen others in various parts of Great Britain, for the purpose of acquiring additional knowledge in their profession, by, if I may be allowed the expression, "mutual friction," and which also enables them by association and good fellowship not only to advance their individual interests, but in many ways to confer a benefit upon the public at large, there is a large class of men with whom by necessity architects are daily brought in contact, having no society of the kind whatever,—I allude to the clerks of works, builders' foremen and managers, and others placed in a similar position. I may be told that there is a society called the "Clerks of Works and Builders' Foremen's Association," or some such title, but I think this is only a benefit society; at any rate, we hear and read but very little about it,—in fact, an inquiry in a contemporary relative to its *locale* and functions failed to elicit a single reply. I maintain that the large body of men fulfilling the positions of clerks of works, managers and foremen to builders, carvers, art metal-workers, decorators, and other trades allied to building, are not only of due necessity the most practical of their respective callings, but are possessed, many at least from large and life-long experience, of varied and technical information that would not only be of much service to their younger brethren treading in their footsteps, but of mutual gain to all concerned.

The *Builder*, many years ago, took up the cause of the present Architectural Association, and I submit that the *Builder* to-day might with equal fitness take up the cause of an Association of Clerks of Works and Foremen Builders. The present age is one of progress, and in the battle of life no effort should be spared, whatever our position, to fulfil, in the best possible manner and to the utmost of our abilities, the duties imposed upon us. The *Builder*, from the first, has strongly advocated the advantages of mutual self-help, and I therefore with the more confidence suggest that an intimation to the effect that you, sir, would be willing to receive the names and occupation (not necessarily for publication) of those willing to move in the matter, and by a small annual subscription provide sufficient funds for the ordinary expenses of an association of the kind, would in the columns of the *Builder*, as an initiatory step, be quite sufficient to test the general feeling on the subject.

A Clerk of Works.

DEVELOPING SOUTHAMPTON.

The Corporation have been for some time past carrying out very important works of street improvements and paving. The whole of the footways of the High-street on each side of the ancient Bargate have been repaved with Caithness stone flagging, supplied by the Caithness Stone Flagging Company, of Thurso, Scotland, the gradients of the carriage-way and line of street being at the same time considerably improved.

In the district of Portswood nearly eleven miles of new roads have been made up and completed. The suburban streets are being paved with Staffordshire blue bricks, supplied by Mr. Joseph Hamblet, of West Bromwich; they are laid upon a foundation of Portland cement concrete, 3 in. in thickness, and well grouted in with Portland cement. A separate system of storm water-drains is being gradually laid over the whole borough for the relief of the existing main sewers.

The works, which up to the present time have cost nearly 15,000*l.*, have been carried out by the borough surveyor, Mr. W. B. G. Bennett, Assoc.-M. Inst. C.E., and at the last meeting of the Town Council it was unanimously resolved to spend a further sum of 6,250*l.* for blue brick paving.

Building operations are being carried on with great activity; in one district alone upwards of 600 houses have been erected by an enterprising townsman, Mr. Jonas Nichols, who has laid out nearly four miles of roads; the district is named Nichols Town, after its founder. The town is greatly indebted to this gentleman for his gifts of several pieces of valuable land for the purpose of public improvements.

A very pleasantly-situated estate known as Westwood Park, adjoining the Southampton Common, has recently been laid out for building purposes, and several villa residences have already been erected, principally from the designs of Mr. James Lemon, F.R.I.B.A. Another extensive estate known as Fitzhughs, in the adjoining district of Shirley, has also been laid out for the same purpose, and a great number of houses have been erected, and many more are in course of construction. Building operations on a large scale have also been commenced on two other estates, and it is proposed to connect a fifth to Southampton by erecting an iron bridge across the river Itchen at St. Denys. A great impetus to building has lately been given by the introduction of the tramways into Southampton.

For many years the Corporation have been endeavouring to prevail upon the London and South Western Railway Company to abandon their level crossings, a source of great inconvenience to the public at Bridge-road and Marsh-lane; their endeavours have been successful, and the company are now constructing a handsome high level bridge across their lines.

This work when completed will be an imposing structure, and a great boon to the public. The contractors are Messrs. Bull & Sons, and the cost of the work is estimated at 40,000*l.*

A very determined effort is being made by the inhabitants to obtain a second line of railway into the town by extending the Didcot and Newbury line from Newbury, and a bill is to be promoted in Parliament in the next session for the necessary powers. The Town Council at a recent meeting resolved to subscribe 50,000*l.* towards the undertaking from their corporate funds. This resolution was enthusiastically ratified by the burgesses at several large public meetings, as was also a resolution granting for the use of the company about 30 acres of the mudlands of the Western Bay, the company undertaking to reclaim in all about 47 acres, and to construct a public roadway 60 ft. wide and 3,000 ft. long, on a solid embankment facing the water. Independently of the sum above mentioned, a public subscription amounting to 50,000*l.* has been raised in the town. The Corporation of Newbury have also resolved to subscribe a sum of 10,000*l.* out of their corporate funds in furtherance of the project, and a similar proposition has been adopted by the Corporation of Winchester. The Harbour Commissioners have not been unmindful of the requirements of the port, and they have recently carried out large works in extending their quays and warehouses, and are about to apply to Parliament for powers to borrow 100,000*l.* for further extension works.

Southampton stands fifth on the list of ports of the United Kingdom, and the familiar saying of the Southamptonians that their town is the Liverpool of the South bids fair to be more than realised, for naturally Southampton is favourably situated for the development of docks and quays.

EXETER.

Restoration of St. James's Church.—The second portion of the work of rebuilding the Parish Church of St. James has been completed, and the ceremony of re-opening took place on November 25th. The church was erected in 1836, but it could not be regarded as an architectural ornament to the city, and it never afforded sufficient accommodation for the church-going population of the parish. When the parish of St. James was separated from that of St. Sidwell, between forty and fifty years ago, the population of St. James's parish was about 3,000. The church was built to accommodate 1,200 worshippers, but it never did afford accommodation for anything like that number. The whole cost will probably be not less than 6,000*l.* The architect is Mr. R. Medley Fulford, of the Cathedral Close. The architectural style of the building is the First Pointed. Mr. Stile was the builder. Prominent as the chief adornment of the new chancel is the east window, erected in memory of the late rector, the Rev. A. Buckeridge. It is a triple-lancet window, 18 ft. high, filled with stained glass by Messrs. Clayton & Bell. The window contains a representation of the Crucifixion, the Blessed Virgin, and St. John. The total cost of that portion of the work was about 1,400*l.* The next section of the work taken in hand was a nave and three bays, with shallow arches, extended eastwards about 20 ft., shallow aisles, west porch, and tower. The final portion of the work, proposed to be undertaken as soon as funds will allow, is that of the two shallow transepts, with the double arches in a line with the future nave arcade, and circular staircases for access to the galleries for school-children, thus enabling them to leave the church quietly. All the principal contractors hail from Exeter. The builder was Mr. Gibbard; the mason Mr. Robert Mitchell; and the gasfitters Messrs. Sheppard & Sons. The carved angels are by Mr. Harry Hems; and the geometrical glazing is by Mr. Fred. Drake.

St. Petrock's Church.—On November 24th the Lord Bishop re-opened the Parish Church of St. Petrock, which has been considerably enlarged and restored from the plans of Messrs. Hayward & Son, at a cost of 1,250*l.* The contractor was Mr. Cumming, of Exeter, and Messrs. Easton & Sons, of the same city, did the masonry.

The Cathedral was lighted with gas for the first time on Advent Sunday, November 27th. Innumerable jets go round the abaci of the capitals. Mr. Fred. Rice, gasfitter, of Exeter, has carried out the work.

The Old Guildhall.—The Elizabethan front of this ancient building was built in 1593. It projects picturesquely over the pavement of the main thoroughfare, and is a unique feature in Exeter's venerable High-street. Some of the stone-work having fallen down, the Town Council requested Mr. Edward Ashworth, architect, of that city, to examine the façade, and he has sent in a report upon it, in which he says that the mode of staying the front, where it has been disposed to bulge, is not quite satisfactory.

CITY OF LONDON SCHOOL: SCULPTURE.

SIX firms were lately invited to send in models and sketches in competition for the sculpture for the City of London School now being erected on the Victoria Embankment by Messrs. John Mowlem & Co., under the direction of Messrs. Davis & Emanuel, architects. The committee having selected those sent in by Messrs. Daymond & Son, these gentlemen are now appointed to execute the work, which consists of allegorical figures in the tympans, representing the Arts and Sciences, the keystones having masks representing the ancient Classics, and the five niches statues of their more modern eminent representatives. In the spandrels will be placed the shields of the City Companies and other donors.

ACTION OF WATER UPON LEAD PIPES.

ACCORDING to reports of the proceedings at last week's meeting of the London Commissioners of Sewers, the medical officer (Dr. W. Sedgwick Saunders) laid upon the table a pamphlet on the action of water upon lead pipes, being a translation which he had made from the French of M. Belgrand, in which, after giving particulars of a series of experiments undertaken in conjunction with M. Felix le Blanc, a distinguished chemist and gas examiner, M. Belgrand says:—"Upon the whole, there is absolutely no danger of poisoning from the use of water flowing through leaden pipes. . . . . I do not think that any other mode of distributing water can be recommended, even to nervous people." It is not stated that Dr. Saunders commented on this assertion; surely, however, there is evidence extant in England of the evil results that have been caused by drinking water of a certain composition which had passed through leaden pipes?

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,941. W. Cunningham, Dundee. Ventilating apparatus. Nov. 11, 1881.

4,943. G. Tall, Brixton. Compound for preventing the escape of steam, gas, water, &c., from joints of pipes. Nov. 11, 1881.

4,949. W. F. Padwick, Redhill. Insuring a supply of water in cisterns, pipes, &c., during frost. Nov. 11, 1881.

4,953. H. W. Gates, Brighton. Ventilator for chimneys. Nov. 12, 1881.

4,963. J. L. Hancock, Dalston. Ovens, kitcheners, and gas cooking-stoves. Nov. 12, 1881.

5,003. H. Barron & H. Raimes, Kilburn. Water-closets. Nov. 15, 1881.

5,018. W. T. Sugg, Westminster. Gas cooking apparatus. Nov. 16, 1881.

5,023. T. G. Messenger, Loughborough. Charging water-closet syphons, &c. Nov. 16, 1881.

5,027. E. R. Hollands, Newington. Open stove or fire-grates. Nov. 16, 1881.

5,030. W. B. Shorland, Manchester. Knobs or handles for locks, latches, &c. Nov. 17, 1881.

5,033. B. O'Neill, London. Manufacture of artificial marble, &c. Nov. 17, 1881.

5,039. T. Beddoe, Bermondsey. Disinfecting water-closets, urinals, &c. Nov. 17, 1881.

5,040. J. B. Potter, Yeovil. Stoves and fireplaces. Nov. 17, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

Nov. 15, 1881.

3,079. J. Cornforth and E. T. Burton, Birmingham. Open fire-grates. July 14, 1881.

4,188. G. Hatton, Southport. Spanish sunblinds. Sept. 29, 1881.

* Compiled by Hart & Co., patent agents, 29, New Bridge-street, E.C.

Nov. 18, 1881.

3,515. J. W. Gibbs, Liverpool. Downcast ventilating cowls. Aug. 13, 1881.

3,778. W. Leggott, Bradford. Apparatus for actuating window-sashes. Aug. 30, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending November 19, 1881.

1,530. J. C. J. Smith, Northfleet. Manufacturer of cement.

This is an improvement on Patent No. 1,583 of 1872, in completing the thorough drying of the slip by the time that the dry-slip in the kiln has been converted into clinker. In the drying-chamber are baffle-plates, so arranged that the heated gases from the charged kiln traverse the drying-chamber in close contact with the surface of the slip. April 7, 1881. Price 6d.

1,555. J. G. Tongue, London. Treating and preparing bituminous substances.

The bituminous substance is heated, and finely-crushed carbon or ground coke is thrown into the mass and well stirred. It is then still further heated for a period of ten hours. The preparation can then be either cast in moulds or used for surfacing roadways, &c., in a liquid state. (Com. by H. Handhahn, Waldau, Prussia.) April 9, 1881. Price 6d.

1,566. H. J. Allison, London. Clips for securing slates or tiles on roofs.

This clip is formed of metal, and consists of two parallel branches of unequal length, which clasp the purlin. At the top of the longer branch a space is arranged for the slates or tiles. (Com. by J. J. B. Celier, Nevers, France.) (*Pro. Pro.*) April 11, 1881. Price 2d.

1,576. W. E. Gedge, London. Indicating apparatus or slide-bolt for doors of water-closets, &c.

A plate is connected with the inside bolt, which shows through an aperture in the door and indicates when any one is in. (Com. by J. François, Lyons.) April 11, 1881. Price 6d.

1,616. F. A. Lawrance, Stevenage. Sash-bars.

These bars are formed of two pieces of metal. The cross-section of the lower part is the shape of a double fluked anchor, the shank of which is enlarged to form a ring. The upper part fits over this ring, and the two edges rest on and hold in position the glass that rests on the flukes below. April 13, 1881. Price 4d.

1,618. G. E. Wilson, Leeds. Latches and locks.

To enable the latch to be disengaged by pulling the knob instead of turning it, a projecting piece is fitted on the knob-spindle, which engages a cam on the bolt. A spring is used to force the bolt back again when this projecting piece allows it to move. April 13, 1881. Price 6d.

1,641. J. H. Blum, Bienne, Switzerland Liquid meter.

This consists of a hollow cock, which has two compartments, the capacities of which are known. They are alternately filled and emptied. Various modifications are shown with and without counting mechanism. April 14, 1881. Price 8d.

1,646. H. P. Holt, Leeds. Sanitary appliances for buildings.

Each building has only one connexion with the drain, in which connexion are two traps. The first trap forms a grease-box which has holes, and is made to lift out for cleaning purposes; the second trap is an inverted box, with its open edges dipping into the cavity over which it is fixed. The closets are flushed by syphons, which are brought into action either by a piston moving in a cylinder to withdraw the air, or by a smaller syphon worked by the door or the seat. April 14, 1881. Price 6d.

THE POLLUTION OF THE SOIL BY INTERMENTS.

SIR,—I have read with much satisfaction the article in a recent number of your journal, entitled "The Soil and its Influence on Human Health," being the substance of a lecture delivered by Dr. Pettenkofer, of Salzburg, before the German Society of Natural Philosophers and Physicians. "As the influence of the soil," according to the lecturer, "showed itself most clearly in the case of epidemic diseases," it can scarcely be controverted that much of the infection which occurs in London is, in a great measure, attributable to the presence of over-crowded cemeteries. As the body must be decomposed and its elements distributed among Nature's great reservoirs of material,—earth, air, and water,—it is of paramount importance that the repositories of the departed should be situated at safe distances from dense populations.

The *Times* not long since treated of the serious peril to health, and even life, arising from the deleterious atmosphere of large towns. That epidemics, in themselves preventible, swell the bills of mortality, is a fact testified to by eminent authorities. "In the ignorance of the sufferers," remarks the leading journal, "consists their helplessness. They sicken, and, indeed, they die, but they cannot prove it, and cannot even describe the causation. When people know

more of the air they are breathing, they will be able to protect themselves." A report of the French Academy of Medicine attributes the diphtheritic disease that at one time raged in the vicinity of Père-la-Chaise, Montmartre, and Montparnasse to the putrid emanations from these seething burial-places. The re-appearance of the plague at Modara, in 1828, is alleged to have arisen from an excavation made in some ground, where the victims of the plague had been interred three centuries previously. The virulence of the cholera in London during 1854 was augmented owing to excavations having been made for sewers in the sites where the victims of the great plague were buried. And Mr. Simon has warned the authorities of what is likely to happen again if sanitary preventives be not adopted.

Were there no suitable provision at hand to meet the mortuary wants of a large and growing community like that of London, it would be sad indeed. Fortunately, however, there exists the spacious London Necropolis at Woking, with its excellent soil, and its salubrious site, so convenient to the metropolis. This cemetery, as Mr. Seymour Haden pointed out in his published letters, is amply sufficient to meet the prospective annual mortality of London for a long time to come, and this without disturbing a single body for at least ten years, or crowding a number of corpses into one grave, as is the custom in other places. The "pit-system" of burial is highly objectionable, especially on sanitary grounds, inasmuch as it tends to poison the soil and infect air and water. HYGIENE.

TESTING TRAPS.

SIR,—As one of the committee present at the experiments carried out at Messrs. Pullen's, on Saturday, the 19th ult., will you kindly allow me to call the attention of your readers to one of the conditions under which those experiments were carried out, viz.,—the unusual depth of drop between the valve and water-line, 13½ in.? Having during the past three years carried out many hundreds of experiments with closet-traps, I am in a position to say that a more unfair test could not be applied, for while it is rather an advantage to the "Helmet," it is a very great disadvantage to the round ℧ and the "Eclipse."

Feeling, from my knowledge of this matter, that the true merits of the various traps are not yet fairly before the public, I now challenge Mr. Davies, and, provided that the Messrs. Pullen will grant the use of their scaffolding and apparatus for the purpose, I will undertake to prove before a committee,—

1. That the Helmet-trap is not to be relied upon unless protected by soil-pipe ventilation.

2. That a ℧ or half ℧ trap can, when properly ventilated, be made perfectly safe, when fixed beneath a valve-closet.

3. That a ventilated ℧-trap can be fixed beneath a valve-closet with any length of drop, and will hold its seal against the most severe attacks to which it can be subjected.

4. That a ventilated ℧-trap, fixed with its outer leg upon the top of 45 ft. of soil-pipe, is perfectly safe, either under a valve or a direct-action closet.

DANIEL EMPTAGE, S.E.

*** Since the above was in type we have received several other letters protesting against the mode in which these experiments were conducted and the deductions made, especially from Mr. John Smeaton and Mr. Hellyer. It is unnecessary to print them. Mr. Buchan has also written.

POSITION OF THE SPHINXES.

SIR,—The reference in your recent issue to the Obelisk has, I hope, set many thinking why there should be any hesitation on the part of the Metropolitan Board of Works as to the position of the sphinxes at the base of Cleopatra's Needle, and what authority can be given for the sphinxes being placed facing the Obelisk, as if meditating how their tail companion had found his way hither.

The idea of the Trafalgar-square lions being placed to face Nelson's Column would of itself be meaningless, to say nothing of the want of dignity as a result. It would, of course, have proved a miserable failure. No better precedent can be given than the Landseer lions, and the symmetry and *entourage* of Cleopatra's Needle require that it should be followed.

The custom, moreover, by the ancients, of placing their sphinxes as guards to their palaces and temples, surely dictates that the position should be towards the approach, to boldly face the foe, and not to appear to crouch and skulk away with their tails between their legs. Such a notion is unworthy an Egyptian sphinx,—a combination of the noblest qualities,—intelligence and power, the man and the lion.

Let us consider for one moment the effect in that marvellous avenue of sphinxes between Luxor and Carnac (a distance over 6,500 ft. in length), if all their tails, instead of their heads, were turned towards their royal master and conqueror, as the trophies of victory were being conveyed with stately march to yon sacred temple. Would the sphinxes, under such circumstances, have added much to the glory of the scene? H. H. BRIDGMAN.

CEMENT FOR KILNS.

SIR,—May I be allowed to ask, through the medium of your columns, if Portland cement would be a suitable material to use as mortar for building a brick-kiln, and if so, what would be the best sand to mix with it, and in what proportion?

From some small experiments I have made in repairing kilns, I am inclined to think favourably of it, and, before using it on a larger scale, desire to know what has been the experience of others. RICHARD R. NORRIS.

DISTRICT SURVEYORS.

SIR,—I am glad to find public attention is called to district surveyors and their duties.

There can be no doubt that the 37th section of the Act is not interpreted in its true spirit by some at least of the gentlemen who hold the office, and it is a direct source of grievance to many professional men that a public officer of the Metropolitan Board of Works should also act in connexion with cases in his district on behalf of the leaseholder and occasionally the freeholder. It is in the smaller transactions, such as dilapidations, repairs, letting of land after some dangerous (?) buildings have been removed by his order, &c., that the temptation occurs to blink at the 37th section. A. C.

STAINED GLASS.

London.—A window has just been erected at St. George's Church, Tufnell Park, to the memory of the late Rev. W. McCall, the first vicar. It is by Messrs. Burlinson & Grylls, and is a very good window; colour subdued and the drawing good.

East Berghelt.—A large stained-glass window has been fixed by Messrs. Lavers, Barraud, & Westlake in the north wall of the church, alongside another window dedicated to the Hughes family, and erected by the same lady,—Miss Gratiana Maria Hughes. The window is in remembrance of the Rev. Sir Richard Hughes, bart., and of his wife. The subjects consist of the "Martyrdom of St. Stephen," the "Conversion of St. Paul," "Paul and Silas singing Hymns in Prison," "The Angel appearing to St. Paul on board ship when he was wrecked," "Abraham and Sarah," the "Virgin Mary and Joseph," "Baptism," "Our Lord taking little Children up in His Arms and blessing them," "The Marriage in Cana of Galilee," "The Lord's Supper," and "Christ ordaining the Twelve Apostles." At the top of the window our Lord is represented delivering His "Apostolical Commission" to His disciples before His ascension,—"Feed my Sheep."

King's Heath, near Birmingham.—A three-light Munich stained-glass window, by Messrs. Mayer & Co., representing the "Ascension," "Christ in the Temple," and "Our Lord Blessing Children," has just been presented to King's Heath Church, near Birmingham, by Mr. F. Everitt, in memory of his son, a likeness of whom is introduced in the latter light.

VARIORUM.

THE seventh volume of "The Proceedings of the Association of Municipal and Sanitary Engineers and Surveyors" (E. & F. N. Spon) is a useful little book for those concerned in the matters of which it treats. It includes the opinions of practical men on practical subjects, and should assist in bringing about the prevalence of correct views. It is edited by Mr. Thos. Cole.——Foremost amongst a little heap on our table of shilling books for Christmas comes "The Belgravia Annual" (Chatto & Windus). It commences with an interesting story by Mr. Wilkie Collins, "Your Money or Your Life," and there are many others to match, with the usual run of illustrations. It is a good shillingsworth for the lovers of mystery.——The illustrations of "Yule Tide, Christmas number for 1881," which are numerous and good, include, moreover, one of the best chromo-lithographic reproductions that have yet been given with a serial of the kind, "Young Mother Hubbard," after G. D. Leslie, R.A. The letter-press, too, seems quite up to the average. It is published by Letts, Son, & Co.——"Thirteen at Dinner, and What Came of It," Arrowsmith's Christmas Annual, 1881, claims to be the first thing of the kind that has been produced in the provinces, and we can honestly say it is very well done, both from a literary and pictorial point of view. Arrowsmith's address is Bristol. ——For quantity of matter and number of illustrations the Christmas number of "Harper's Magazine" (Sampson Low) stands first of its kind, and some of both is very good. We are bound to confess, nevertheless, that we have found some of the letter-press dull.

The Big Bell for St. Paul's.—We are told that the casting of the new bell for St. Paul's Cathedral has just been completed at the works of Messrs. J. M. Taylor & Sons, Loughborough. When it is dug out, within the next day or two, it will weigh no less than 17½ tons. It will be the largest bell in the kingdom, if not in Europe. The process of conveying the new bell to London will be one of great difficulty, says our informant. Common-sense asks why the bell was cast so far away?

Miscellanea.

St. Martin's School of Art, Long-acre. At the distribution of prizes last week, Mr. Val Prinsep, A.R.A., who presided, addressed the students, and in the course of his observations he advised them to visit the different picture-galleries in London, and, when there, to ask themselves what the artist meant to express when he painted the picture. And the same thing applied to sculpture. Beauty was, no doubt, everywhere, and it was one of the great functions of art; but as art was not born in man, but was a matter of education, so also was the idea of beauty. It seemed likely, he said, that art would rise again with redoubled success. True art was a mixture of art and nature. Art by itself would not do, neither would nature by itself; the two combined were necessary. He warned them against being led away by enthusiasm and over-estimating the value of a work of art executed by themselves. They were apt to admire things that struck them as original, but which were only eccentric. "Eccentricity was not genius" was a precept he would impress upon them; nay, he would have it written in letters of gold on the walls of every art-school in England, where the students seemed more influenced by peculiarity than the Frenchman or the German. Lately we had heard much of the "æsthetic." Æstheticism was in possession of the stage and in the mouths of all. Æsthetics might be seen in our streets, clad in sad greens and sickly yellows, with long or unkempt hair and shaky legs. The word came from the Greek, and originally meant "sentiment, or the pleasures derived from the senses." The greatest geniuses had been the simplest men, and it was these great men who might be called æsthetes, professors of the science of the beautiful, expounders of the beauties of nature. Let them, then, be true followers of æstheticism. When such a knowledge of art, such a profusion of the beautiful, got thus spread, art would prosper and find very much more scope on which to exercise its civilising power.

Warning to Tenants of Old Houses.—At the Cambridge County Court, the case of St. Peter's College *v.* Irwin and Mills was tried before Mr. Bagshawe, Q.C., and a jury. It was an action brought by the Master and Fellows of St. Peter's College to recover of the defendants the sum of 50*l.* or the return of an ancient piece of carving. The defendant Irwin was the occupier of a public-house at Cambridge belonging to the College, and in the tap-room over the fire-place was an ancient piece of carved woodwork, supposed to be upwards of 300 years old, and which it was believed at one time formed part of the old College library. The defendant Irwin was a sub-tenant of the lessee, and it was proved that he and Mills about the 15th of August last removed the carving and substituted in its place ordinary woodwork. The defendant Mills took it away and endeavoured to sell it, and, according to his evidence, on his failing to find a customer, it was chopped up and burnt. It was undoubtedly part of the freehold. The Judge directed the jury that the article, not being produced, on the authority of the leading case of "Armory *v.* Delamire" they must presume it to be of great value, and, after a short deliberation, they assessed its value at 40*l.*, that sum to be reduced to 40*s.* on the return of the carving, which, it was alleged, had not been destroyed.

Disinfecting Dens.—Dr. Domett-Stone, speaking of recent deaths from sewer-gas, says, many lives might be saved and fevers averted if our parish authorities would instruct their sanitary inspectors to see that disinfectants are copiously and frequently used. Probably the most effective, and assuredly the cheapest, costing less than one farthing a gallon, would be found to be a solution of chloride of lead, so strongly recommended by the late Dr. Goolden, of St. Thomas's Hospital, as the most simple, the most powerful and economical agent for eliminating sulphide of hydrogen from the atmosphere, as well as from all organic matter in a state of decomposition or putridity. It is prepared thus:—Half a drachm of nitrate of lead dissolved in a pint or so of boiling water, to be mixed in a pail of water, in which 2 drachms of common salt have been dissolved. A cloth, dipped into the solution, and hung up in any place where bad odours prevail, will sweeten the fœtid atmosphere instantaneously, or thrown down a sink, water-closet, or drain, or over a heap of refuse, will produce a like result.

St. Mary's R.C. Cathedral, Newcastle.—The re-opening of St. Mary's Catholic Cathedral, Clayton-street, Newcastle, after being restored and decorated was celebrated by special services. The work of restoration, which has extended over a period of three months, consisted of new flooring, newly varnished seats, and renovation of the stone work, executed by Mr. John Foggin, contractor, Newcastle, and painting and decorations by the firm of Lavers, Barraud, & Westlake, of Endell-street, London. The decorations are in the style of the fifteenth-century. The nave-roof has been painted red and buff, with decoration on the main timbers. A border in light red, on buff, runs over the arches, terminating at the top of each column with a crowned M under a small canopy. The timbers are of light red, with buff ornament, the chambers of buff and black, and the front member of rafters bear a number of *fleurs-de-lis* in gold. The panels are diapered with quatrefoils in grey, the centre of which contains a gold star and *fleur-de-lis* alternately. The walls of the chancel have borders in green over the arches, and they have been diapered with a rose and lily, each having the inscription beneath, "Ave Maria." The figures of the Blessed Virgin and St. Gabriel under canopies representing the Annunciation, have been painted by Mr. N. H. J. Westlake. There are also four figures of angels under canopies, holding scrolls. The whole of the work has been executed under the supervision of Messrs. Hansom & Dunn, architects, of London and Newcastle.

Bust of Mr. Ruskin.—A meeting was held on November 26th, in the Ruskin Drawing School, Oxford, for the purpose of presenting a marble bust of Mr. Ruskin by Mr. Boehm to the University galleries. Many of Turner's drawings and other munificent presents of Mr. Ruskin to the University were displayed in the Art School, the foundation and endowment of which are the work of the same benefactor. Dr. Acland, on behalf of the subscribers, proposed, "That the bust should be given to the Ruskin School of Art, as a lasting memorial of affection, respect, and admiration." Mr. Ruskin, he said, had founded a school in Oxford, furnished with over 800 examples of the most varied and often costly description. Henceforward the pure love of nature, the technical interpretation of it, and their relation to mind and to religion, would be taught to all coming generations through the wide foundations he had laid. This was seconded and carried. Thanks were also voted to Mr. Boehm.——Mr. Ruskin, it is said, has changed his plans with respect to the museum he has founded at Sheffield, and it is his intention to devote the remainder of his life to making it about the most complete institution of the kind in the world. He has decided to send there his unique library from Brantwood, and a portion of the books and plates have already arrived.

The Coming Health Congress at Brighton.—Rapid progress is being made in the Pavillion grounds in the construction of the iron annexe for the forthcoming Health Congress, which commences on December 13th. This annexe will consist of a main building, 200 ft. long and 40 ft. wide, running along the northern side of the lawn, at right angles to the main road through the grounds; and there will be a building in continuation of the same, 60 ft. in length by 20 ft. in width, connecting it, at right angles (parallel to the west side of the Grounds), with another building, 230 ft. long and 32 ft. wide, which will be entered from the Corn Exchange. On the south side of what is described as the "main building" (immediately south of the Dome) will be another building, joining it about the centre and ovrving (for 230 ft. in length with a width of 20 ft.) towards the grand entrance to the Pavilion itself. These buildings will all be of corrugated iron.

Royal Hibernian Academy of Arts.—At the annual meeting, held the other day, the following gentlemen were elected as officers for the year 1881-82:—President, Sir Thomas A. Jones; Professor of Painting, Mr. Augustus Burke; Professor of Soulpture, Mr. J. R. Kirk; Professor of Architecture, Mr. J. J. McCarthy; Professor of Antiquities, Mr. J. T. Gilbert, F.S.A.

The Grays Thurrock Gas Company have recently extended their works by building a 52 ft. brick and concrete tank, engine and boiler-house, oxide and purifier sheds, coal-stores, offices, photometer-house, boundary-walls, &c. The engineer was Mr. A. Williams, of Bankside, and the contractor Mr. W. J. Botterill, Cannon-street.

Sir Henry Thompson on Art.—On Wednesday in last week, Miss Thompson, daughter of Sir Henry Thompson, presented the prizes gained by the students of the City School of Art, at the School-hall in Bishopsgate-street. Sir Henry Thompson afterwards addressed the students. He spoke of the cultivation of art in connexion with ordinary work. There was, perhaps, he said, no source of wealth in this country which was so large, and at present so little tapped, as that which existed in the association of mental culture with ordinary work. The amount of increase in the value of an article was illimitable when once it had come thoroughly in contact with human brain. Art improved the position of the workman who studied it in connexion with his work. Thus, the carpenter could become a carver, the mason a sculptor. He believed that the market for artistic industrial products in this and other countries would exceed the supply, great as that was becoming; but he was not sure that there would be so great a demand for simple pictures, and he was almost appalled at the number of artists and art students at the present day. He advised those who intended to adopt the profession of painting to go to nature for their inspiration, and to copy no painter, however excellent his work might be. If they merely copied, they would never come to anything. Michelangelo and Raffaelle did much mischief unwittingly through being great, for men said, "Let us draw like Michelangelo and paint like Raffaelle," and the consequence was the deterioration of painting, by imitation, for a full century. The sources of inspiration which those great masters had gone to were neglected. He gave London high praise as offering subjects to the painter. The Thames was a mine of wealth from end to end. While looking from the Adelphi towards Westminster at sunset there was often to be seen a view equal to Venice.

An Eight Thousand Pound Blunder.—It seems that the ridiculous jealousy which prevails between the departments of some of the officers of the Corporation and the department of the Engineer to the Commission of Sewers has at length led to a very serious blunder, by which the ratepayers are to suffer to the extent of some 8,000*l.* At the last meeting of the Commissioners of Sewers, Mr. Boor moved a resolution to revoke an agreement come to at the last Court as to an arrangement to be made for acquiring the freehold interest in the ground required to widen the public way of Leadenhall-street and Gracechurch-street, and to pay to the leaseholders in respect of their interests therein an amount of 8,000*l.* The land, which was the property of the Corporation, was let to a syndicate, including, said Mr. Boor, "amongst others, a member of the Court." The City Architect was asked, but denied that any improvement was contemplated at that spot; and in due course the syndicate signed an agreement for the re-erection of the premises on the ground. This is pretty much the history of the transaction; and it comes, as Mr. Boor says, to this, that "the Corporation, through the gross laxity of one, if not of two, of their officers, had actually created interests for leaseholders before one brick was laid, for which the ratepayers were now asked to pay 8,000*l.*"—*City Press.*

St. Pancras Industrial Exhibition.—The Lord Mayor on Saturday last distributed the medals and certificates awarded in connexion with this exhibition. Mr. E. M. Close (a member of the adjudication committee) stated that 58 certificates, 39 bronze medals, 13 silver medals, and 20 special certificates had been awarded. The exhibitors who received silver medals were as follow:—Robert Dawkins, machine used in shoe-making; Ernest Alfred Sullivan, audible railway signal; W. Aumonier, carved wood panels; W. F. Jenkins, wood carving; Thos. Cusdin, ornamental brickwork; G. W. Pinfold, objects of natural history. Amateurs.—W. Donn, inlaid work; W. Hooper, oil-painting; J. S. Teape, oil-painting; H. Recknell, water-colour painting; E. Benning, pen-and-ink drawing; H. Shirley, pencil and crayon drawing; C. Eriam, patchwork quilt. At the conclusion of the distribution, the Rev. G. M. Murphy moved a vote of thanks to the adjudicators, which was seconded by Mr. C. J. Tarring, and acknowledged by Mr. White, F.S.A.

Competition: Wimbledon.—In a limited competition for Congregational church and schools, Wimbledon, the design submitted by Mr. W. D. Church, architect, of South-place, Finsbury, was chosen by the committee.

Parkes Museum: International Medical and Sanitary Exhibition.—The certificates of awards, lithographed from the original design by Mr. Cave Thomas, are now being distributed. The number of exhibitors from different parts of the United Kingdom was 414, exhibitors from abroad, 88; making a total of 502 exhibitors, o whom 258 obtained either awards of the first class or awards of merit.

Surveyors' Institution.—The next meeting will be held on Monday, December 5th, when a paper will be read by Mr. E. P. Squarey, entitled, "Land Legislation and Tenants' Improvements," and a paper by Mr. P. D. Tuckett, entitled, "The Cause of the Failure of the Agricultural Holdings Act of 1875 and the present Agitation for Protection for Tenants' Capital."

The Late Mr. Macdonald, M.P., has bequeathed to the University of Glasgow the whole of his books on the subject of mining, and also 1,000*l.* for the foundation of bursaries to be held by young men who have actually worked underground as miners.

Re-Assessment, Barnet Union.—Mr. Charles F. Jones, of Temple-chambers, Fleet-street, has been chosen by the Guardians to re-assess the rateable value of all property within this Union, comprising 24,500 acres of land, and 6,274 houses. There were forty-two candidates.

The Smithfield Club Cattle Show opens on Monday next. Report says that there has been brought together an exceptionally good collection of implements and machinery. Some of the exhibits which are of special interest to our readers we may notice in our next.

Sanitary Institute of Great Britain.—The Autumnal Congress and Exhibition is arranged to be held at Newcastle-on-Tyne, in 1882.

TENDERS

For restoration and enlargement of All Saints' Church, Crowborough, Sussex. Messrs. Whitfield & Thomas, architects. Quantities by Messrs. Evans & Deacon:—

Card & Son	£3,492 0 0
Rowles	3,293 0 0
Vaughan	3,179 0 0
Paramor & Son	3,130 0 0
Cheeseman	3,128 0 0
Hughes	2,990 0 0
Bingham	2,797 0 0
Morris	2,750 0 0
John Paine	2,650 0 0

For additions to shop, Market-place, Great Yarmouth, for Mr. G. B. Palmer. Mr. J. W. Cockrill, architect:—

Isaacs, Great Yarmouth	£1,153 0 0
Beech & Cork, Great Yarmouth	1,028 0 0
Norfor, Southtown	919 0 0
Cooper, Great Yarmouth	900 0 0
Davy, Great Yarmouth	893 0 0
Springall, Great Yarmouth	870 0 0
F. Howes, Great Yarmouth	846 0 0
Want, Great Yarmouth	849 0 0
J. T. W. Bray, Great Yarmouth*	780 0 0

* Accepted.

For additions to a workshop at No. 144, Packington-street, for Mr. J. Wright. Mr. F. Hill, architect:—

Hughes	£320 0 0
Grover	297 0 0
Fernley	280 0 0
Dearing & Son (accepted)	260 0 0

For repairs, &c., to houses, Lewin-road, Streatham, and 59, Russell-square. Mr. W. Paice, architect:—
Walter H. Smith (accepted).

For the erection of a residence at the Ridgeways, Enfield, for Mr. W. J. Eales. Mr. W. D. Church, architect:—

Fairhead (accepted)	£1,980 0 0

For the erection of a pair of semi-detached residences at the Ridgeways, Enfield, for the Rev. H. S. Toms and Mr. J. Garner. Mr. W. D. Church, architect:—

Fairhead (accepted)	£2,560 0 0

For repairs, &c., to eight houses, Durham-street Vauxhall, for Mr. W. H. Withall:—

Lapthorne & Co.	£213 0 0
Drew & Co.	211 15 0
Williams	200 0 0

For alterations to the premises of Mr. H. H. Emanuel, Stag House, Southampton. Mr. Arthur Martin, architect:—

Watts (accepted)	£178 10 0
Marble and Iron Work.	
Garret, Hayson, & Shalders (accepted)	115 0 0

For the construction of pipe-sewers, with lampholes, manholes, flushing-chambers, &c., for the Improvement Commissioners of Milton, next Sittingbourne:—
Wilkes & Co., Bishopsgate, accepted.

For pulling down and rebuilding No. 305, Cable-street, St. George's-in-the-East, for Mr. Kendrick. R. Petert, architect:—
Parrish, Burdett-road accepted.

For the erection of school-buildings at Alton-street, Bromley, Tower Hamlets Division, for the School Board for London. Mr. E. R. Robson, architect. Quantities supplied by Mr. T. Thornton Green :—

McGregor	£16,477	8	8
W. Brass	13,849	0	0
Higgs & Hill	13,699	0	0
Wood	13,586	0	0
Roberts	13,485	0	0
Lawrence	13,367	0	0
Boyce	13,000	0	0
Cox	12,882	0	0
Kirk & Randall	12,787	0	0
Robson	12,611	0	0
Grover	12,588	0	0
Chappell	12,580	0	0
Atherton & Latta	12,465	0	0

For the erection of shops and offices at Great James-street, Bedford-row, W.C. Mr. F. C. Notley, architect. Quantities by Mr. W. Barrett :—

A. J. Boulton	£3,792	0	0
Haywaith	3,718	0	0
Patman & Fotheringham	3,623	0	0
Macey & Sons	3,534	0	0
J. & J. Greenwood	3,490	0	0
Langmead & Way	3,475	0	0
E. Lawrence	3,380	0	0
B. Nightingale	3,237	0	0
Axford	3,175	0	0
Allan & Sons	3,150	0	0
S. J. Scott	3,143	0	0

For the construction of road and drainage works on the United Land Company's Ealing Green Estate :—

Wilkes & Co.	£1,993	0	0
J. Jackson	1,775	0	0
Nowell & Robson	1,747	0	0
Wilson & Stodhard	1,719	0	0
Cooke & Co.	1,700	0	0
Beadle Bros.	1,618	0	0
J. Bloomfield	1,617	0	0
E. Wilson	1,569	0	0
Tomes & Wimpey	1,592	0	0
J. Carders	1,589	0	0
G. Acock	1,571	0	0
Ford & Everett	1,400	0	0
J. Pizzey	1,387	0	0
G. Felton	1,377	0	0
Dyer & Huntley (accepted)	1,292	10	9

For the erection of private dwelling-house, Thurlow Park-road, Dulwich, for Mr. Edmund Hornsby. Messrs. Wm. Hudson, Son, & Booth, architects :—

Cooper	£2,900	0	0
Bowyer	2,820	0	0
Morter	2,697	0	0
Brass	2,649	0	0
Duncaston	2,591	0	0
Wilson & Exton	2,558	0	0
Higgs	2,346	0	0

For rebuilding No. 8, Bacon-street, Bethnal Green, for Mr. W. Witherden. Mr. W. D. Church, architect. Quantities supplied by Messrs. Nixon & Raven :—

Wire	£1,464	10	0
J. Taylor	1,395	0	0
Tyrman	1,392	0	0
Godden	1,353	0	0
Steel	1,280	0	0
Shurmur	1,278	0	0
Sabey & Son	1,200	0	0

For pulling down and rebuilding 57, Bird-street, Lambeth, for Mr. W. Hart. Mr. Banister Fletcher, architect :—

Buckham	£278	0	0
Cook	259	0	0
Eldridge & Gee (accepted)	220	0	0

For the erection of a dwelling-house at Woodford Wells, Essex, for Mr. D. Schwinge. Mr. H. W. Sexton, architect :—

Harper	£1,873	0	0
Bange	1,569	0	0
Wells	1,559	0	0
Knight	1,545	0	0
J. & H. Cocks	1,497	0	0

For repairs, &c., to Nos. 16 and 17, Winchester-street, Pentonville-road, for Mrs. Tebbutts. Mr. W. D. Church, architect :—

Saunders	£354	0	0
Sabey & Son	280	0	0
Steel Bros.	255	0	0
Godden (accepted)	250	0	0

For public works, Steventon Inclosure. Quantities by Mr. W. Gentry Bingham :—

R. Palmer	£14,446	17	7!
F. Talbot	11,200	0	0
W. Stubbs	10,335	0	0
C. Chamberlain	10,368	8	1
J. Dover	9,950	0	0
B. Cook & Co.	9,825	0	0
J. M. Smith	9,500	0	0
W. Harris	9,419	0	0
W. J. Botterill	9,280	0	0
W. Buxton	9,148	0	0
J. T. Simpson	9,046	13	11
W. Hickery	8,985	0	0
G. Middleton	8,579	0	0
J. Durnford & Son	8,554	0	0
F. Ottaway	7,983	5	9
R. Eustace & Son	7,783	0	0
W. Monslow	7,499	0	0
W. Rigby	7,199	12	6
J. Currall & G. Lewis	7,044	0	0
Bottom Bros.	6,850	0	0
J. T. Welch	6,571	0	0!

For alterations and additions at Nos. 3 and 4, Stroud Green-road, Finsbury Park, for Mr. Earle. Mr. W. Smith, architect :—

Shurmur	£495	0	0
Dunford & Langham	484	0	0
Cole & Chart	425	0	0
Stevens Bros.	415	0	0
Harper	414	0	0
Steel Bros.	407	0	0
Mattock Bros.	393	0	0

For finishing five houses at Middle-lane, Hornsey, for Mr. Elder. Mr. J. Farrar, architect :—

King	£947	0	0
Farnborough	802	0	0
Harper	790	0	0

For the construction of a service reservoir and intake works at Ceilwart, for the Barmouth Local Board. Mr. Thomas Roberts, engineer :—

J. Williams, Ceilwart, Barmouth	£1,203	0	0
J. Williams, Fronolen, Barmouth	1,198	0	0
S. P. Owen, Portmadoc	1,069	0	0
G. Williams, Harlech	859	0	0
Frague & Co., Birmingham	845	0	0

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Smokeless Heat.



THE Exhibition of Smoke-preventing Appliances at South Kensington, of which we gave some account in our last number, now presents an aspect entirely its own. Eminently and especially does it strike the visitor as a business affair. Not only is this the case with regard to the nature of the exhibits themselves, the enormous blocks of glittering coal, the metallic beauty of the samples of coke, the slow but unresting toil of the mechanical stokers, the repeated answers to the same questions, and attempts at the solution of the same problem, which have given a strong family likeness to the offspring of so many different minds, but the character of the exhibits seems reflected in the faces and behaviour of the visitors. Here you see the country clergyman earnestly studying a stove which, in his mind's eye, he has already fitted into his carefully-restored church. There it is the lecturer, the sanitary reformer, the medical man, who is chiefly bent on studying the union of the difficult aims of warming and ventilation. Through all these thronging groups of reasonably anxious faces peer the keen eyes of the salesmen, the inventors, the speculators. The glow and lustre of many of the furnaces, stoves, and gas-burners add a life to the whole scene, contrasting very forcibly, and very pleasantly (in the early part of the present week) with the keen wind, close drizzle, or clinging fog without. Whatever may spring from the exhibition, it has already established its character as an earnest and business-like scene.

It would be unjust alike to our readers and to the exhibitors to attempt to anticipate the verdicts which it will demand no small amount of care and competent skill to make the means of eliciting the best uses from this display. We mentioned in our former notice that a professional man (of whose valuable contributions to the library of the civil engineer we have had repeatedly to speak in terms of high commendation), has been appointed to superintend the trials, under the direction of the executive committee. We may be pardoned for the remark that, eminent as are some of the names on which the public are thus invited to rely, a more definite authority would perhaps have clothed the future utterances of the promoters of the exhibition if the form of a small scientific commission, charged definitively to report on the exhibits, had been adopted. Such is the mode usually employed abroad. In this country the public are beginning to fight somewhat shy of "committees"; and though it may be said that the difference between a committee and a commission is only in name, it may be replied that, even if so, it would be well to give to the public the more satisfactory name. But what we mean is something more essential. It is that the public ought to have it clearly impressed on them that no pains will be spared to bring out clearly, impartially, and scientifically the chemical, mechanical, and commercial values of the most deserving exhibits, and to do this, not only in a manner that will serve once for all, but so as to form a new chapter in the engineering history of the country.

We can imagine two men,—we may almost say the same man in two different states of mind, or of bodily health and comfort,—walking through the galleries, and summing up their impressions in two very opposite sentences. "Well," says the one on whom the weather, the tardiness of the train, or the late hour at which he went to bed on the previous night exerts a depressing influence, "what do we get from all this? Is there anything here that we did not know before,—in principle, at all events? Does any one think that London skies will be any the brighter for the lighting of so many additional fires at South Kensington?" "Well," says the other, who looks, habitually and happily, at the bright side of things, "it is really delightful to see how much intelligence has been devoted to the settlement of a great question of every-day mechanics. The way in which so many inventors have hit on the same idea shows how true that idea must be. Can there be any excuse for London remaining as black as it is? Is it not even already more free from fog than it was last year?" In fact, each of the two imaginary visitors would have uttered what was true; and if we were hard-pressed for an opinion we should say, "If England is to maintain her prosperity for another 500 years, we do not doubt that the skies of London will be purified from the noted canopy of smoke which forms the baldaquin of the royal city's seat. But we do look in a different direction from that indicated by any single exhibit that caught our eyes at South Kensington for the efficient cause." We observe, however, that Dr. Siemens has not allowed the mode of employing electricity that was present in our thoughts to escape his attention, as will be seen from p. 96 of the Catalogue, describing an appliance that we were not fortunate enough to see at work.

Generally speaking, the attempts made by the inventors whose works are here collected may be divided into two main categories, viz.:—the use of smokeless fuel, and the improved use of fuel that is not smokeless. The third category, —that of the future,—barely represented at South Kensington, though the glowing platinum wire in several of the open grates might well have suggested the thought to the inventors,—would comprise the production of heat by dynamic energy, to which we confess that we look forward as hereafter certain, however long deferred that hereafter may be.

It must not be forgotten that while we possess a greater choice of fuel than most nations, we have deliberately, or, at all events, practically made choice of the most smoke-producing for our domestic use, and also that we generally burn this in the most wasteful and extravagant manner. What we seek for in fuel is not only heat; but, it must not be forgotten, a sort of cheerful companionship, the enjoyment of which has become a part of the national character. Here, in truth, lies the knot of the smoke question. Efficiency, economy, convenience, cleanliness, readiness at a moment's call,—all these things can be produced by other means, better than by burning the best flaming coal in an open grate. But so strong is the partiality for the companionship of the fire, that waste, inconvenience, dirt, and cost are,—we were going to say cheerfully,—incurred, rather than lose the fireside charm. We are not justifying the choice,—we only say that it *is* the choice of nine persons out of ten. Of all the reasons against the open fire it seems to us that the economic one is that on which most reliance will have to be placed. But here the most convenient, instant, cleanly, and, in some respects, efficient, mode of heating is not, apparently, the most economical.

The use of smokeless fuel is, of course, a more simple solution of the problem "How to abate London smoke," than any other. Without anticipating the report of the Executive Committee, we may say that we are inclined to give the preference to the class of exhibits illustrating this principle. And we shall look with interest for the exact details of those chamber-grates in which, with the addition of a very small dose of gas, anthracite coal is burned. There are three kinds of this pseudo-gas fire,—one in which all the heat comes from the gas; asbestos, or other non-wasting material, being kept at a glow in the grate, but not really adding to the production of heat. In the second, coke is used; the heat is great, but the fire looks dull. With anthracite there is cheerful flame, great heat, and no smoke. To this point, then, we call very serious attention.

And here we have to lament that the most formidable contributor to the coal merchant's bill, viz.,—the kitchen-fire,—has not, by any means, received proper attention on the part of the exhibitors. The cheapest, the most constant, the hottest for its consumption, and, in nine points out of ten, the best, kitchen-fire known in England and Wales, is not represented at South Kensington. It is one to which, not so very long since, we called attention in these columns, speaking from long and ample personal experience,—the ball-fire of Pembrokeshire. It is easy to understand the omission. But it is as unfortunate as it is capital, and it is one that

tends very much to strengthen the tone of the remarks previously made about the difference between committee and commission. The former will probably hold themselves bound only to report on actual exhibits, even if they give the time and attention necessary for that. Now, no tradesman or commercial exhibitor is likely to exhibit the Pembrokeshire ball fire, for the simple reason that he has nothing to gain by so doing. The grate is so simple,—the whole affair is so inartificial, that there is no money to be made out of it by an exhibitor. The only chance would be for some great mining company, or owner of vast stores of culm or anthracite coal dust, to send up the balls of clay and culm ready for use. And no doubt the picturesque little Welsh woman, whose tall hat and tidy jacket excited a sympathetic feeling of which gravity forbade the expression, would soon teach the executive committee how to "stum up a ball fire." Most imperfect is the exhibition, as a guide to domestic economy, until this be done. If London servants could be induced to use the Pembrokeshire fire in the kitchen, London smoke would at once be reduced by probably one half, and London coal-merchants' bills in an almost equal proportion.

But we must not omit a caution as to the great drawback in the use of anthracite coal. To the ordinary visitor to South Kensington the evil may not be apparent; but to the miner, or the person familiar with the Carmarthenshire or Pembrokeshire district, what we mean was very vividly recalled by the exhibition. As sources of heat, what struck us as the most effective in the galleries, were certain low, plain furnaces in which pure, unmixed anthracite was burning with intense glow and steady radiation. Nothing, it might be said, could be better, say for a hall fire, or for warming some great open building. But the genial glow radiated from these simple and admirable stoves is accompanied by an insidious soothing effect, against which no precaution should be neglected. Carbonic acid gas, the choke-damp of the mines, is so freely liberated from the steadily-burning anthracite, that in a small room, with doors and windows closed, we have not the smallest doubt that one of these furnaces would very rapidly prove fatal to a slumbering or inattentive inmate. This great danger attending on the use of this beautiful fuel demands the most careful attention.

Side by side with these effective anthracite furnaces we may mention one which seems to us to combine as many of the defects of this mode of burning as could well be. Many fire-bars hid most of the flame, decrepitation was loud and constant, and a heap of unburned coal accumulated under the grate as we stood by.

Of the use of gas alone as a fuel two exhibits deserve special attention. One is, the Siemens gas-furnace, supplied with a spit made to revolve by clockwork, which is run into a sort of metal baker's oven, heated by a row of gaslights on either side. As to this the test of actual cooking must be applied before it is possible to do more than point out the neatness and cleanliness of the arrangement. The question of cost has also to be elucidated.

The other, which struck us as not only original but beautiful, is the only rival that we have seen to the open drawing-room fire. We are aware that we speak of a matter of taste, and one as to which very conflicting judgments will probably be formed. We refer to the open fireplace of curved and burnished copper, which reflects the light and heat of a row of gaslights concealed from the eye. The effect is that of a magic furnace. It is possible that the eye would tire of the steady glow, as contrasted with that constant change in which many of us feel the chief charm of the drawing-room fire to lie. But we confess that we should much like to make a fair trial of this gas-stove, and also to know its cost, as compared with the production of equal heat from coal. As to ventilation, and as to purity from dust or any product of combustion, we are disposed to give a very high rank to this fireplace. Still there is something to be inquired into concerning it.

On the subject of combustion of gas, we shall be doing great service to the public by calling attention to the simple and excellent duplex gas-burner of Thomas Heron. We were perhaps led to dwell rather longer than might have otherwise been the case on this exhibit from the fact that the inventor had gone over ground which we had recently beaten; and that an unusually courteous and intelligent agent gave such a practical demonstration of the economy of gas and of light to be effected by the simple substitution of one of these burners for one of ordinary construction, as to render it unnecessary to wait for the report of the committee.

It is well known to those who have studied the subject,—being, indeed, the secret at the bottom of Mr. Sugg's great improvements in gas-lighting,—that by the ordinary mode of burning gas we obtain not more than perhaps an eighth part of its luminiferous power. The conditions under which the full power is to be educed are, first, the supply to the flame of the proper dose of warm air for combustion, neither too much nor too little; and, secondly, the delivery of the gas to the flame at a very low pressure. As to the first of these, a closed system attains the best result in the production of light; but, on the other hand, there is a loss of light in passing through glass. As to the second, we had the disappointment to find that our own invention of a small orifice admitting the gas into a hollow burner, whence it escaped by a larger opening, had been previously patented. Of this expedient Mr. Heron makes use, but instead of one, he uses, side by side, two batswing burners placed on a sort of capsule. The double flames warm and comfort one another, and to some degree act as does a closed system, while the pressure of the gas is brought down to an economical tension. The value of the process is demonstrated by the simple plan of bringing two jets together. And the question of quantity of gas, as compared to light, is beautifully illustrated by two little gasholders, placed side by side, and connected, one with a common, and the other with a duplex burner. A simple photometer measures the intensity of the shadow; an index shows the consumption of the gas. To show that all is fair, the connexions of burners and cylinder are reversed. With a much stronger light the duplex burner consumes not more than two-thirds of the supply of an ordinary bat's wing. As to the value of the duplex burner, it is thus competent to the ordinary visitor to form an accurate opinion by the use of his own judgment, if he gives time enough to apply the perfectly conclusive tests supplied by the exhibitor.

The above are some of the remarks which struck us with reference to the use of smokeless fuel. We must reserve any that occurred to us as to the question of appliances for the better consumption of flaming coal.

CHARTOGRAPHY AND EXPLORATION OF SYRIA AND PALESTINE.

A reduced copy of the 1-in. survey of Palestine, of which we gave a notice on the 17th of July, 1880, has been recently issued. For the ordinary student this smaller map, which is on the scale of three-eighths of an inch to the mile, will probably prove more convenient than the twenty-six sheets on the larger scale. For topographical research, indeed, the 1-in. scale has long been accepted as, all things considered, the best. But research of this kind is a speciality,—almost a speciality of the surveyor or the geographer. And on a ¾-in. scale it is practicable so to mount the map, either on a roller or folded in a case, as to keep the whole country before the eye of the student, a matter almost impracticable on the larger scale. In a university or public building, indeed, the large survey may be hung on the walls, as was the map of England on those of the Museum in Jermyn-street. But admirable as is the effect of such a display at a *conversazione*, or public meeting, or the like, its utility is more questionable. It is beyond the power of the ordinary unassisted eyesight to identify names on a map so exposed. An idea of the physical outline of the country, not altogether unlike that which is obtained from a lofty mountain, may be formed from the display; but this is all. And this idea, in the case of the Holy Land, would not be very much more distinct than that to be gained by a glance at the smaller map. In those portions of extraordinary hill shading which denote the ravines and cliffs running down to the valley of the Jordan, and bordering the Dead Sea, indeed, the rules of orographic representation make the smaller map much less effective than the larger. But, on the other hand, the former is engraved; and the advantage thus given, in clearness and beauty of designation, over the photo-zincographic method adopted in order to keep the price of the large map within moderate limits of price, is very conspicuous. For any but special students the ¾-in. map, consulted with the aid of the Bible Handbook, will meet every requirement, and bring as clearly before the imagination of the student of Scripture the localities, and even the chief physical features, of the scenes in which took place the events recorded in Holy Writ, as can well be done without actual pilgrimage to Palestine.

There is one point in which the new map tends rather to awaken than to satisfy curiosity. The eastern limit of the country delineated is formed by the western shores of the Dead Sea, of the Sea of Galilee, and of the Huleh lake, and by the course of the Jordan between these expansions of its waters, and to the north of the last-named lake. The line thus traced leaves a wide margin of undelineated ground within the border of the map, to the east of the river, except at about latitude 33° 25′, where the eastward trend of the river as its channel is traced upwards to Banias, makes a little inroad in the ruled margin of the map. The arrangement on paper is as good as the physical features of the ground admit; but the force with which the blank strip of paper appeals for support for the prosecution of the survey of Eastern Syria will, we hope, be found to be irresistible. As to this, the latest quarterly report of the Palestine Exploration Fund speaks of decided progress, although the presentation of the great map to the Sultan does not seem to have induced any great desire in the mind of his Highness to facilitate the further progress of exploration. It is much to be desired that no political difficulties should be allowed to hinder the prosecution of a research which is purely scientific. Any hesitation on the part of the Porte as to the wisdom of allowing such surveys of Palestine as may be of military value to be made by European engineers would be now quite out of date. We are far from denying that such considerations might have had some weight with many statesmen as to the survey of Palestine itself,—the ancient battle-ground of Egypt and Assyria, and later of the Cross and the Crescent. But this is now done. The survey is made, and we apprehend that there can be little doubt that full military details as to the country are in the possession of at least one intelligence department in Western Europe. The survey of Eastern Syria has by no means the military value which attaches to that of Palestine, and no well-grounded military or political objection can be raised to the completion of a survey from which the Porte itself would derive important information, which would be of little or no value, in case of war, to any unfriendly power.

Another point of extreme interest in the prosecution of the survey of Eastern Syria is hinted at in the above quoted report, and no doubt will receive full, and perhaps unexpected, elucidation. This is the occurrence of megalithic remains on the sites described in the Bible as those where were to be found the descendants of the giants. The remark is not altogether new. Several trilithons were known to exist in Syria, and three of them are engraved in the *Syrie Centrale* of Comte Melchior de Vogüé. Mr. Fergusson says as to them, "What interests us most at present is the knowledge that these Syrian examples are certainly sepulchral, and their form is thus another argument in favour of Stonehenge, if any were needed." Of the sepulchral character of the cromlech, composed of four upright and one covering stone, there is the evidence of the discovery of skeletons in such monuments, in which we think the bodies were entombed in a kneeling attitude. But there may be more question as to the trilithon; and as to those holed stones by which an oath was taken to the Norse gods by persons who joined their hands through the stone. Also the menhir, which is spoken of as a memorial stone, is considered by very competent judges to be a relic of that very ancient form of nature-worship which yet lingers in India, and as to the prevalence of which, in Eastern Syria, in early times, the prophets as well as the Pentateuch speak without any hesitation. In Mr. Fergusson's map designed to illustrate the distribution of dolmens, and the probable lines of the migrations of the dolmen builders, Es Salt and Heshbon, in Syria, are named, and marked with the red shading which is employed to designate the locality of megalithic remains. What the archæologist will now look with interest to be informed about is the nature, as well as the distribution, of the megalithic remains of Moab. Do we find there the whole series of these monuments,—the menhir, or upright stone; the trilithon, which may have been an altar; the holed stone, whether on a dolmen, forming part

of a trilithon, or single; the chamber or cromlech; the kistvaen, or smaller sepulchre; the circle of stones? It cannot fail to throw much light on a very interesting portion of the prehistoric monuments of mankind to learn what and what manner of these mysterious relics are found in the kingdom of Og,—the home of the remnants of the giants, and the sacred places of the worshippers of Baal Peor.

The latest announcement made by the Committee of the Fund gives reason for expecting very much of great interest on these points. It is, of course, only proper to wait for Lieut. Conder's own announcement both of his latest discoveries and of the inference which he draws from them. The work of the last few weeks, we are told, comprises 500 square miles of survey; the examination of 200 ruins, including that of a Sassanian building near Amman, which it will probably prove instructive to compare with the wonderful edifice found by Canon Tristram at Mashita; and some 400 cromlechs. These prehistoric remains are grouped around seven distinct centres. Menhirs, or standing stones, have also been found, and stone circles in connexion with both classes of monuments. Thus, as far as architecture is concerned, the few weeks of the exploration of Moab have already produced more fruit than a much longer period spent in the often-explored region of Palestine. The connexion between, at all events, one class of megalithic building and the rites of an early idolatrous worship will be illustrated. References in the sacred text which have lost any intelligible meaning from the adherence of the translators to the pointing of the Rabbis,—which usually is conducted on the principles of obscuring anything like plain truth,—are likely to be restored to their true historic import, and the latest Syrian building era of importance, that of the Saracens, will be illustrated by the comparison of the Sassanian building above mentioned, and also of an early Moslem mosque in Amman, with the Kubbet es Sakhra at Jerusalem.

MUNICH AND VENICE.

WE hear a great deal in the present day about wall-decoration and fresco-painting; the capital of King Ludwig was, as all know, foremost in the modern revival of the great art which once flourished so brilliantly in Italy; the results of that revival have long been familiar to the student of art history. It is, therefore, with no surprise that many will learn that the experiment of open-air fresco-painting is at length practically shown to be a failure; the wall pictures in the Hofgarten arcades have long been peeling off from the wall in spite of constant repair, and the task at length has been abandoned as hopeless. As for the fate of the frescoes on the New Pinakothek it has long been sealed. A patriotic effort has, however, we learn, been made to rescue from destruction the fresco decorations of the Isarthor, representing the entry of the Emperor Ludwig into Munich after the battle of Mühldorf, the work of Bernard von Nehers; we learn from the same source that the restoration promises technically to be successful, thanks to the use of a new process discovered by a local chemist, Herr Kain, and which, according to the opinion of competent authorities, can be relied upon for its power of endurance against exposure, being washable. It is only from an artistic point of view that the restorations would appear to be open to criticism, the tones of the original,—restored already a great many years ago,—having been seriously injured, a fact not difficult for those even at a distance to realise. In spite of all this, the visitor to Munich would scarcely believe that out-of-door decoration had been condemned; whether some of the frescoes which within a year or so have been boldly used to decorate the façades of several new houses in the Bavarian capital be painted in the new material we do not know, but the artists who have so generously beautified the city have singularly flown in the face of the fate which has overtaken the works of their predecessors. It is difficult, we suppose, at a night's journey from Venice and Verona, and the many other cities of Venetia where the houses still show brilliantly the frescoes of the sixteenth century, for the Munich artists to lay aside their dream of an ideal art-capital.

In the meantime, a city whose existence once realised that dream, Venice, would seem, from the accounts that reach us from certain quarters, to be doomed. More than one wail has already gone forth, supported, of course, by Byron's muse; but the lament against improvements arises from outsiders, who complacently visit the queen of the lagoons to admire its beauty and its past, while at home they never fail to heap upon its unhappy inhabitants abuse and pity for their squalor and misery; and when some slight effort is being made to rouse again the spirit of prosperity in the once-busy canal, there come forward the critics, who beg that England shall be called upon to prevent the steps taken by the municipality to stay at least the daily downward course of their unhappy city, to decently drain its houses, and ensure a proper water-supply. The question is, indeed, a difficult one. Is Venice to sink and sink to ruin to gratify the tastes of a few *dilettanti* travellers, or is she to make some effort to show herself worthy of her glorious past? This effort the authorities are making. In the first place, we learn that the question of the water-supply is practically solved, and in two years or so we shall hear no more reports of water-famine from the Rialto; while, in addition, an artesian well is being bored. Several of the more important thoroughfares are being, or have been, asphalted, planted with trees, and provided with seats; other thoroughfares (for Venice is not all canals) have been broadened, notably the Via del 22 Marzo, where a number of new buildings have been erected, which it is to be regretted, however, do not, from all accounts, possess any very great artistic character. Perhaps the most successful architectural work of modern Venice is allowed to be, not the Palazzo Franchetti, opposite the Belli, almost universally condemned; but the Cassa di Resparmio, or Savings Bank, the work of the architect Trevisanato, and which will complete the plan of the Piazza Manin. An excellent example has been given here by the adherence to the red tone given to its façade, resembling that of so many of the old palaces of Venice and the *terra firma*.

Now that the fierce heat of the public indignation expressed at the restoration of the façade of St. Mark's has cooled down, the work is being quietly continued, though happily, it may be stated, under the direction of a commission, with the assurance regarding the competency of which we must, we suppose, rest satisfied. Conservation and not restoration is the course being pursued, much greater care being observed than previous to the European remonstrance. The external mosaics are being, or have already been, attended to, as also the bas-reliefs inserted in the façade; at present we learn, from a correspondent of the *Zeitschrift für bildende Kunst*, that the two portals on the right are hidden by the hoarding behind which it is customary in Italy for work of this nature to be executed; at this angle of the façade there are, it will be remembered, not a few columns and supports out of the perpendicular. Interiorly the work of restoration is proceeding, in the baptistery and the Cappella Zeno. Among other works in progress, we are informed that the corner of the arcade of the Doge's Palace, towards the Molo, is at length freed from the scaffolding and hoarding which have so long concealed this angle of the beautiful edifice, and the long line of the capitals of the arcade pillars, — well known to those familiar with Venice, or indeed with Mr. Ruskin's "Stones of Venice," or the studies of the late Mr. Burges, — now stands in unbroken order. A report has reached us to the effect that some changes are being effected at the base of the Campanile, in the shape of restorations to Sansovino's charming *loggietta*, but the work is, we believe and trust, confined to some necessary repairs.

Memorial of Dean Stanley.—We understand that the form of memorial which is likely to be proposed is that of a monument comprising a recumbent figure, to be executed by an eminent sculptor, and placed near the grave in King Henry's VII.'s Chapel, as nearly as possible underneath the memorial window dedicated by the Dean to the memory of his wife, Lady Augusta Stanley. It is thought to be not unlikely that the outlay necessary for a monument of the kind may be defrayed by a large number of smaller contributions, and that enough may also be collected by individual or combined subscriptions to go far to fulfil a design constantly cherished by the late Dean,—that of completing the restoration of the ancient Chapter-house by filling in the windows with stained glass.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute, held on Monday evening last, Professor T. Hayter Lewis, vice-president, in the chair, the minutes of the previous meeting were read and confirmed.

Illness of the President.

The Chairman.—With respect to the health of our President, as I need scarcely say, every one here is extremely anxious to know the worst, and therefore I am commissioned by the council to explain exactly the position of matters. I deeply regret to say that our President has indeed had a very severe attack of illness. At first the symptoms were very serious, but I have the greatest possible pleasure in saying that Mr. Street is now better, and I cannot do better than read to you a letter which I have received from his son, Mr. Arthur Street, who, in answer to our latest inquiries as to his father's health, writes:—"I am happy to say that I can give a decidedly satisfactory account of his progress. He has been sickening for his illness for so many months that it is natural we should look to a rather slow recovery; still, perfect rest for a time will, no doubt, restore him to perfect health." I may add that I have seen Mr. Street, and he is now about to seek rest and change, at the suggestion of his medical advisers, abroad, —possibly he may go as far as Egypt. At all events, he will take sufficient rest, so that we may hope after due time to again see him amongst us the earnest hard-worker that he was, perfectly restored to health.

Prospective New Members.

The Secretary read the names of a great number of candidates for membership who had been approved by the council. The list included fifteen or sixteen applications to become Fellows of the Institute; nearly a hundred applications from gentlemen desirous of becoming Associates; and five applications for Honorary Associateship.

Native Buildings on the Gold Coast.

The first paper read was entitled "Notes on the Native Buildings on the Gold Coast," by Major Bale, Associate. The author observed that all native buildings on the Gold Coast and far into the interior of that part of the African continent, are constructed of materials at hand and readily adapted to the situation. At Cape Coast Castle flat roofs for catching rain-water were common, and indeed necessary, as no good water was to be had nearer than the Sweet River, six miles further off. In the town of Elmina the houses were, for the most part, thatched. The walls of the huts were of clay or "swish," kneaded and placed round upright poles obtained from the forests. Some of the clay was very ochreous, and yielded, with very little manipulation, a very good ochre. The houses or huts were built by female labourers, nearly every one of them with a baby on her back. Where cracks showed themselves in the clay walls, as they invariably did after a short time, they were puttied up with "swish." All partition walls were carried up from the ground right through the roof, dividing the roof into sections or compartments, the divisions being provided with water-channels where necessary. In elevation the native huts often have a breadth of effect almost amounting to repose and dignity. Some of the details, such as cornices (or, rather, their equivalents) were of small slack-burnt bricks, cemented together with "swish." These bricks were burnt in kilns fired with brush-wood. There was a composite class of houses, built of forest-poles tied together with monkey-ropes or withes from the forest. The natives had no idea of tying a lashing properly, but they twisted the withes when wet round the poles, and when they dried, their shrinkage held the timbers firmly together. Laths of split bamboo were tied on horizontally between the framing, and over them "swish" was floated by means of bamboo floats. Huts of this class were generally provided with window-blinds, and the door-openings were covered by means of mats made of bamboo and coarse grass. The roofs were of thatch. Sometimes they were built with gables, and sometimes provided with a chimney on the gable to carry off the smoke from the fire, which latter was simply laid on the floor of the hut. It was remarkable that some of the native buildings were almost

identical in design with the stone buildings of ancient Egypt. Most of the outer walls were built with a batter, although the overhanging cornice was omitted. The question naturally arose, Did the ancient Egyptians merely reproduce in stone and granite a style of building similar to that now to be found on the Gold Coast, just as the Greeks reproduced in marble the features of antecedent wooden buildings? Sir Gardner Wilkinson seemed to be very much of that opinion. Unfortunately, the natives of the Gold Coast, like nearly all African peoples, had no history, only traditions. They were mentioned by writers of antiquity, but were lost sight of until the Portuguese re-discovered them. The Phœnicians traded with them, and, according to Herodotus, some of them were employed in the building of Solomon's Temple. However that might be, it was extremely likely that a great deal of the gold and ivory used in the Temple came from the neighbourhood of the Gold Coast. The first European explorers of the country were the Portuguese, who built the Castle of St. George d'Elmina in 1481, and subsequently Cape Coast Castle and other castles were erected. The features of all these castles showed them to be Portuguese work. They were built wholly of random rubble-work in stone, cemented with "swish," and the surface rendered with mortar. It was from the Portuguese that the African first learnt to build in stone. The flat roof was adopted by the Portuguese and Dutch, but discontinued by some of the English, who sometimes used roofs that succumbed to the weather like umbrellas in March or April. Some of the natives had used corrugated iron roofs over mud huts! The Africans had learnt very little since the Portuguese left them. In every one of the Portuguese forts the principal apartment was devoted to the purposes of a chapel, but the Dutch, French, and English neglected this, amongst other things. The natives were now totally uninstructed in the technical arts of the European traders. None of them had the remotest idea of a truss for a roof, or the simplest notion of construction, yet, with persistent and practical teaching, they were, he thought, capable of becoming very good workmen. The late Major Home was also of the same opinion.

The Works of the late Major Mant, R.E.

Mr. R. Phené Spiers read the second paper, which was "On the Works of the late Major Mant, R.E., Fellow." Mr. Spiers observed that the architectural works designed and carried out by Major Mant were of so special and important a character that some notice of them would be of interest. Major Mant joined the service in 1857, being then about nineteen years of age. He went to India in the latter part of the year 1859, where his promotion was rapid, and where he soon began to turn his attention to the practice of architecture. He was elected a Fellow of the Institute in May last, being the first Fellow who belonged to the Royal Engineers. He designed and superintended many of the most important buildings which have been erected in India during the last twenty years. His first work was at Surat, which was in a style partaking of Gothic, but soon after this his attention appeared to have been directed to the study of the indigenous buildings of the country, and it was in a style developed by him on the basis of that of the native structures, and to which he gave the name of Hindoo-Saracenic, that his most important buildings were erected. The Town-hall at Kholapore, the High Schools at Bhownuggur and Kholapore, and the monument to the Rajah of Kholapore, were among Major Mant's works next referred to. The working drawings of some of these buildings were prepared by him in England during an extension of furlough. The secret of his mastery of the details of the style in which he worked was, that he made himself thoroughly acquainted with the workmen, his linguistic attainments being, of course, of great service to him. He engaged and trained a staff of native draughtsmen to work out his designs in detail, he, of course, being responsible for the plan and general *ensemble*. The buildings which he carried out were, as a rule, totally different, in regard to the requirements to be met, from the buildings from which he derived his inspiration with respect to style. His first buildings were so successful that he soon had an extensive practice, and he was so fortunate as to attract the attention of Sir Richard Temple, the Lieutenant-Governor of Bengal. Subsequently, when Sir Richard Temple became Governor of Bombay, Mant followed his patron to that Presidency, and about the same time designed and carried out the College at Dacca. He made two designs for the Mayo College at Ajmere in 1876, the smallest of which was being carried out, and in the same year he erected the Hospital and Library at Baroda, at a cost of 30,000*l*. In 1878 he commenced the Hospital at Kholapore. His three chief works, however, were the palace for the Gaikwar of Baroda, the palace for the Rajah of Kholapore, and the palace for the Maharajah of Durbhunga. The designs for the latter were not completed at the time of Major Mant's death. Its cost was estimated at 180,000*l*. The palace at Baroda, which was now being carried out at a cost of 200,000*l*., had a principal façade 530 ft. in length. In plan it was divided, roughly speaking, into three blocks, the central portion containing the Gaikwar's residence, the left-hand portion the Durbar and state rooms, and the right-hand portion the zenana, or ladies' part of the house. The Durbar hall was an immense apartment rising through two stories of the palace, with carriage-porch and colonnades. In construction the main walls were of brick faced with vitreous sandstone of different colours. It is proposed to use marble for the domes and principal architectural adornments. The Kholapore palace was not so large as the one just referred to, but would cost 65,000*l*., and covers an area of 100,000 square feet. In conclusion, Mr. Spiers alluded in feeling terms to the circumstances attending the sad death of Major Mant, who died by his own hand during a fit of temporary insanity.

In the discussion which followed,

The Chairman said that he was afraid there were no gentlemen present (except Major Bale) who had studied building on the Gold Coast, and if no one wished to speak on that paper he would at once call upon Major Morant to speak upon Mr. Spiers's paper.

Major Morant said he must first of all thank Mr. Spiers for his very generous notice of the life and works of his (Major Morant's) brother officer and friend. There could be no doubt, he thought, that Major Mant's buildings had been very successful, especially since he abandoned the Gothic style, which was unsuited to the country. Major Mant's greatest successes dated from the time when he adopted a style founded on the styles indigenous to the country, which styles were capable of easily lending themselves to meet modern necessities in domestic and public buildings for India. Of course the Hindoo and Mahomedan builders were more lavish of ornament then it was necessary or even desirable for a European architect of the present day to be, but Major Mant had shown that it was quite possible to preserve the feeling of the native styles even while limiting the amount of ornamentation. In considering the merits of modern works of architecture in India, it should be remembered that it was often necessary that their architects should act as builders and carry out their designs themselves, sometimes even having to make their own bricks and procure their own timber. Although this plan had its advantages, it made success more difficult of attainment. There was a great opening for architects in India, and he was quite sure that if any members of the Institute went out there they would receive as generous treatment at the hands of the Engineers as Major Mant had received at the hands of Mr. Spiers.

Sir Richard Temple said he had great pleasure in bearing testimony to Major Mant's ability as an architect, and to his good qualities as a man and a public officer. A more talented, accomplished, and conscientious Engineer officer never served in India. His career marked an important episode in the history of architecture and engineering in India. The British rulers of India inherited from their native predecessors a very fine architecture, but they went on for nearly a century building structures which, instead of having a civilising effect upon their subject populations, were most barbarous and demoralising in their results. He was glad to say, however, that during the last century we had become cognisant of our defects in this respect, and had built and were building structures which were in some degree worthy of us as a civilised power. In most of the capitals we had produced architects of eminence, amongst whom he might name Mr. Granville and Mr. Bayne at Calcutta, Mr. Chisholm at Madras, and Major Wilkins, Major Fuller, and Major Morant at Bombay. He thought that one reason why our Anglo-Indian architecture had hitherto languished was that there had been no proper technical education in architecture among the civil and military engineers who went to India. He did not say this with a view to disparage the engineers, for whose skill and scientific knowledge he had a great admiration; but artistic taste had not yet become a characteristic of the works done by the engineers as a class. Such men as Major Mant were in this respect exceptionally valuable, and therefore it was that his loss was almost irreparable. In respect of taste, imagination, and of everything that related to beauty and sublimity and to æsthetic culture, — he did not use that word in its present debased sense, but in its high and true sense, — the natives of India far surpassed us. English architects who wished to have their taste refined, their imagination lifted, and their thoughts elevated, should visit India, especially Agra, Delhi, and some other of the places mentioned by Mr. Spiers. As regarded Major Mant's works, their distinguishing merits were that whereas some of his architectural predecessors transplanted bodily to India European styles, and had especially tried to naturalise Gothic in an uncongenial soil, he endeavoured to hit upon some style which should unite the usefulness as to practical requirements which characterised European buildings, with the taste of the native style, and the style which was the outcome of those efforts he called the Hindoo-Saracenic. He seemed to have gradually arrived at that conclusion, for his earlier works partook considerably of a Gothic feeling. If he had one defect as an architect it was that he sometimes omitted to give to his buildings sufficient simplicity and grandeur. They were perhaps a little too much overlaid with details, and sometimes without any grand, striking, or dominant feature. As regarded the native architecture of India, he (the speaker) thought that all the members who could do so should take the earliest opportunity of visiting that most interesting country. There were to be seen not only one style, but many. There were the Buddhist style, the Hindoo style, the modern Hindoo style, and the Mahomedan style, which latter culminated in India under the Great Mogul, who was perhaps the greatest architectural genius who ever lived, not excepting the ancient Greeks. The buildings which he erected were still the peerless structures of the world. Whatever idea the members of the Institute might have formed of the marble structures of Europe, of Milan Cathedral and the like, they would find, if they visited India, that those buildings would pale their ineffectual beauties before the magnificent structures at Agra. He thought it a very happy augury for architecture and art in India that Major Mant's works had been brought to the notice of English architects by Mr. Spiers. Mant was a born genius, for, brought up as a civil and military engineer, he had excelled in architecture without any of the many advantages which the members of the architectural profession now enjoyed. His loss, though not, perhaps, altogether irreparable, could not be repaired, he was certain, from the resources available to the Government in India, and therefore he hoped that if the high and noble work in which Mant was engaged was to be properly carried on, the Government would go to the fountain-head and to the right source by inducing some of the best men in the Institute to go out to India.

Sir Andrew Clarke said that perhaps Major Mant's greatest work would be the College at Ajmere. When the designs for it came up to him from Major Mant, he (Sir Andrew) used the whole of his authority with the view of getting the work carried out in its integrity in accordance with the design. But the "everlasting rupee" caused him to be overruled, and the prominent feature of the design was ruthlessly struck out by the financial minister of the day. Among rising architects in India other than those already named in the course of the discussion, he might name Captain Cole, son of Sir Henry Cole. As regarded the native workmen, he did not think that much assistance was to be expected from them. So far as his investigations had led him, the Indian structures which had been so highly extolled by Sir Richard Temple were the work of European architects and workmen. Round about Agra were to be seen at the present time the tombstones of numbers of Italians who were engaged in carrying out the details of the buildings in question. He did not believe these details were the work of natives, for though the latter were very

patient and conscientious labourers when engaged to work out the designs of others, they were incapable of originating designs of their own.

Sir Joseph Fayrer said that from a hygienic point of view the buildings erected in the native style were far to be preferred to the buildings in the Gothic style which had been erected of late years.

The Chairman, in moving a vote of thanks to Major Bale and Mr. Spiers for their papers, said, with regard to the question of style, that if the English rulers of India adopted, as had been suggested, the native style for their buildings, instead of erecting the buildings they required in their own national style, they would prove an exception to the almost general rule which had prevailed amongst other great colonising nations.

THE NEW CRIMINAL TRIBUNAL IN BERLIN.

THE new buildings at Moabit, near Berlin, for the criminal tribunal, and for the detention of prisoners awaiting trial, were opened on September 16th, after having been over four years in course of construction. The total estimate was 7,000,000 marks (350,000*l.*), and the actual expenditure has been less. This result is attributed to the careful supervision of the principal architect, Herr Herrmann, and of his assistants, Herr Lorenz and Herr Reimann. The cost of construction has been less comparatively than that of any public work of magnitude recently executed in Berlin.

The architecture of the building devoted to the business of the tribunal is in a semi-circular arched style. The plinths, mouldings, and window-dressings, &c., are executed in sandstone, while the remainder of the work is in brown Lauban facing bricks. The two towers, which are on the right and left at the main front, give to the building a monumental character. Above the chief entrance it is proposed to place representations of four Prussian regents who were noted for the interest they took in judicial matters. The decorative effect of the entrance is materially heightened by allegorical statues of an appropriate character. Through the chief entrance an open gallery is reached which leads to the spacious ante-room of the building. From this branch off the different passages communicating with the offices, and from it also rises the chief staircase. In the basement (besides the apartments of the porters and house-servants), is the *depositorium*, or room in which objects of value taken from thieves (or which have been found and are supposed to have been stolen), are placed for safe-keeping.

On the ground-floor are forty-eight rooms, including six session-chambers for the magistrates, with the adjoining consulting-rooms, waiting-rooms, and messengers' offices; the president's room, ten offices for the clerks, secretaries' and advocates' rooms, &c. The first floor is devoted to the jury courts. One is a room measuring about 200 square yards, intended for ordinary occasions. A larger hall, measuring nearly 300 square yards, is not yet completed, but is being fitted up with much taste, and is to be expressly devoted to such trials as are of special interest, and are likely to attract a large attendance of the general public. Cells for prisoners awaiting their turn for trial are also on this floor, as well as the library and other offices in connexion with the procedure of the criminal tribunal. On the second floor are the rooms of the public prosecutor, the investigating judges, the accountants of the court, and heads of different other branches. In the entire building under notice there are 170 rooms. The corridors are mostly paved with Mettlach tiles, but partly with artificial granite, and have vaulted ceilings. The staircases are of fireproof construction. The general arrangement of the building is described as combining simplicity with artistic taste.

The female prison is situated in close proximity to the building of the tribunal, and contains sixty-four separate cells, as well as common rooms, for 150 prisoners. All the isolated cells and corridors have vaulted ceilings, and the staircases are fireproof. The building is constructed of ordinary bricks, and is four stories high.

The men's prison had to be constructed with a view to having as large a number of separate cells as possible, most of the inmates being not yet convicted, and, therefore, for many reasons, having to be confined separately. Thus the number of cells is 712, and there are, in addition, common rooms for 200 prisoners. There are also 40 rooms for overseers, sleeping accommodation for sixty attendants, a chapel, bath-rooms, and other offices. The building is described as being four stories high, and as consisting of five wings, which radiate from the central hall. The construction is said to be similar to that of kindred institutions, built on the cell system. From the wide corridors on the ground-floor, the gates lead right and left to the cells in each wing, access to the other stories being obtained by open ironwork galleries. There are bridges to connect the two ranges of galleries in each wing. The whole can be overlooked by the central overseer. The corridors, galleries, and central hall are lighted from above. Each cell is $4\frac{1}{2}$ yards long, $2\frac{1}{4}$ yards wide, and $3\frac{3}{4}$ yards in height, thus containing about 36 cubic yards of air. The arrangement of the cells is not materially different from that of an ordinary prison. The bed can be folded up against the wall, as also can the small table provided. A cast-iron closet, with flushing apparatus, is near the door; and the appliances for heating and ventilation complete the contents of the cells. A small number of cells of a better class are provided for use in exceptional cases, and are found in a supplementary men's prison, on the ground-floor. The infirmary, arranged for forty-one patients, is on the first floor of the same building. There are also buildings for the residence of the officials. The cooking and washing arrangements are on a large scale, but space precludes our describing these points in detail.

The liquid sewage from the entire establishment is (after disinfection) carried on by a subterranean network of drains to the river Spree, while all other accumulations are periodically removed. These measures are only regarded as temporary, as the whole building will be connected with the drainage system of Moabit as soon as the latter is completed.

The heating of the tribunal building is effected on a new system, which is described as a combination of steam and hot-water heating. The stoves in various parts of the building are constructed to hold water, and are half filled. When a valve is opened, steam is admitted into a spiral pipe, which communicates its heat to the water. The upper part of the stove is, therefore, not filled with steam until the water in the lower part is at boiling point, and when a room has been sufficiently heated the steam is shut off, and the water retains heat for hours. Thus the hot water does not circulate, but is heated in the respective rooms. As the management of the valves requires care, and those unacquainted with them might cause injury to the apparatus, they are all controlled from the basement by an engineer. Speaking-pipes communicate with the basement from the various parts of the building, and there is, therefore, no real inconvenience caused by the distance of the heat-regulating apparatus. Some of the halls are, however, heated with warm air. The prisons have hot-water pipes in each cell, and the pipes are so arranged that heating of the different parts of the building can be separately controlled. The central hall and the chapel of the men's prison are heated by warm air.

The ventilation is arranged on a practical scale. In the jury courts allowance is made for the air being renewed to the extent of 33 cubic yards per hour for each person present, even supposing the parts reserved for witnesses and for the public to be quite full. In winter the air is warmed before it reaches the halls. In the cells a renewal of air, at the rate of about 26 cubic yards per hour, takes place. Each closet has also a special ventilation-pipe.

The site occupies about 48,000 square yards, of which about 16,000 are covered by the buildings erected.

Society of Painter-Etchers.—The Exhibition of this Society for 1882, will be held in London, and will open on the 1st and close on the 30th of April next. All forms of engraving on metal, whether by the burin, the etching-needle, by mezzotint or aquatint, or by whatever other process the artist may choose as a means of original expression, are understood to be included in the term "Painter Etching," and, subject to the approval of the Council, are eligible for exhibition; whether the artist sending them be a Fellow of the Society or not. All works intended for exhibition must be forwarded (suitably framed) on or before the 5th March, 1882, to Messrs. Hogarth & Sons, 96, Mount-street, Grosvenor-square.

THE PIER TURRET, DOVER.

THE turret which has been erected by the Government at the end of the Admiralty Pier at Dover is now virtually completed. The works were commenced in June, 1879, and nothing now remains to be done except to carry out a few minor details. The whole of the work is of a most substantial character, and being the first turret constructed in England for land defences, its progress has been watched with considerable interest.

The fort is constructed at the extreme end of the pier, which has been considerably strengthened by additional granite and concrete blocks in order to procure greater solidity and resisting power, while the turret itself, which is erected above the pier,—that is, rises from the level,—is completely encased, below the embrasures, by a very thick granite wall. This extends all the way round, the entrance to the fort being constructed, as it were, in the wall, so that an observer cannot fail to be impressed with its great strength and security of appearance. Indeed, so much scientific skill has been brought to bear upon the works by Captain English and other well-known engineers, that the whole structure may be regarded as a compact machine, and it is doubted whether an enemy's vessel would ever stand a chance of escaping destruction within its range.

Such is a general outline of the works as they are seen above the pier. The underground chambers for the ammunition and the engine-room are constructed beneath the turret in the solid masonry, and are very beautifully arranged. The engine-room is situated just inside the fort, and is approached through a small manhole. It is a comparatively spacious apartment, having a depth of about 20 ft., but is somewhat irregular in its other measurements. However, there is none too much room for the large quantity of machinery which it contains. The chamber is lighted with gas, and is ventilated by means of a pair of Hodson's patent rotary engines. These, however, will probably be dispensed with later on, and the machinery connected with the ventilating apparatus worked by one of the other engines. This chamber is excavated from 4 ft. to 6 ft. below high-water mark, but the floor and sides to the depth of about 6 ft. are protected by cast-iron checker plating. In the limited space of this apartment there are not less than three distinct pairs of engines, besides those already mentioned. The turret is driven by a pair of engines 80-horse power nominal, while a pair of 16 nominal horse-power engines are provided for adjusting purposes, either of which can be connected with the gear of the turret at a moment's notice by means of a very neatly-arranged break. A pair of engines 16-horse power nominal are also provided for loading purposes. They are connected by shafting with the loading-chamber, and will be employed for raising the ammunition to the muzzle of the guns. Steam is generated in two large tubular boilers on the locomotive principle, and the whole of the machinery and turret is now set in motion every other day, a rule which is likely to be maintained for the purpose of keeping the parts in working order. The fuel is supplied through a coal-bunker in the roof at the head of the two boilers, which latter are situated in a sort of recess apart from the other machinery. Running from the north-eastern end of the chamber is a passage cut in the stonework and leading to the centre of the turret, through which the gear of the machinery passes to the loading-chamber and the fighting-deck. Through here also passes the gear of the indicators. One of these instruments is placed in the engine-room and another at the "conning" hole, where the officer in charge of the gun is stationed, and they are so beautifully arranged that they not only show to a degree the position in which the turret is required, but they also indicate the exact position into which it has been placed after it has been trained.

The ammunition-chambers are similarly excavated, but quite apart from the engine-room, and, like the latter, they, too, are approached through a manhole in the surface. After descending, the visitor traverses a somewhat circuitous passage, scarcely wide enough for two persons to pass abreast, which terminates at the chambers. There are two or three of these chambers, all communicating with each other. The total length of the whole of these excavations is about 40 ft. They are from 8 ft. to 10 ft. deep, with a width of upwards of 12 ft., are constructed in the centre of the solid masonry of

the pierhead, and are surrounded by walls of such immense thickness as to render it practically impossible for any projectile to dismantle them. The loading-chamber is on the level of the pier, and has nothing of a very interesting character about it. Several details connected with it are not yet finished.

But the most interesting part of the work consists in the turret itself. It is the first land-turret which has been constructed, and is calculated to be one of the strongest forts in the kingdom. The shield of armour-plating with which it is encased consists of alternate layers of teak and iron. It commences on the inside with a skin of teak, 1 in. in thickness; against this is a 7-in. armour-plate, and then alternate linings of four thicknesses of 1¼-in. teak, and two 7-in. armour-plates. The whole of these plates rest on a platform, and are held together by 3¼-in. bolts, fastened on the inside, the total thickness of the shield being 2 ft. 8 in. With the exception of the embrasures, or port-holes, the turret is thus completely sealed. The "fighting-deck" measures 32 ft. in diameter, and is entered through a manhole in the floor, of which there is one on either side of the chamber. Both gun-carriages are now in their positions, but there is still a considerable amount of work connected with them necessary to be done before the guns can be mounted. It is very easy to see that when the two guns are mounted there will be very little room to spare. Everything is calculated with great nicety. Just sufficient room is left for the recoil, and the roof is constructed with a double arch so as to admit of the gun being tilted to receive the charge. The framework of the roof is formed of main and cross-iron girders of great strength, which will be covered by stout iron plating, but at present the roof is only temporarily enclosed, the permanent work having been removed to admit of the reception of the gun and gun-carriages. The roof is also constructed with a bomb-proof grating over the breach of the guns to provide for the escape of any smoke emitted into the turret when they are discharged. The guns will be fired by electricity, and it is calculated that they will throw a projectile of 1,700 lb. a distance of nearly 10 miles.

Some idea of the strength and proportions of the turret may be gathered when it is stated that the total weight of iron used in its construction exceeds 550 tons, so that when the guns are mounted there will be very little short of some 800 tons of metal. Some of the armour-plates of which the shield is formed alone weighed from 14 tons to 20 tons; and yet with all this dead weight the whole fabric is set in motion at a moment's notice as though it were a mere toy.

The turret was erected by the Thames Iron-work Company.

ON THE SYMBOLISM OF THE CHURCHES OF BORNHOLM.

BY EDWARD DOBSON, M. INST. C.E.*

In a lecture I had lately the honour of giving before the Philosophical Institute of Canterbury, I pointed out that the study of ancient buildings embraced three classes of considerations, viz.:—

1. The object for which they were erected.

2. The material of which they were constructed.

3. The canon of proportion; or, to borrow a musical term, the "motive" of their design.

I propose to take up some twenty minutes of your time with a few remarks under the last of these three heads, for the purpose of pointing out the manner in which the equilateral triangle furnished the canon of proportion for the Pointed style of architecture, and in what sense this style is essentially and exceptionally Christian.

Following, again, the triple division, which seems to follow a natural law, we may class every building under some one of these heads, viz.:—

1. Buildings erected without any design at all; in fact, unprincipled, though not necessarily bad, buildings.

2. All those structures which have been designed upon some leading principle or canon of proportion, which may be either,—*a*. Utilitarian; *b*. Constructive; *c*. Scientific; *d*. Æsthetic; or *e*. Religious.

3, and lastly. There is a class sufficiently numerous in all countries, composed of buildings erected in imitation of others built upon designs the meaning of which has been lost or forgotten.

A few examples in illustration of this classification will explain my meaning, and help us to understand what is to follow.

There is an often-told story, which, however, will bear repeating, of a contractor who had successfully erected a number of buildings without working drawings or any other designs but those in his own head, who, on one occasion, found to his disgust that he had left insufficient headway for the staircase of an important public building then in course of erection by him, when he swore by all the saints in his calendar that he would never again build a staircase without first "chalking it out on the wall." This is a perfect instance of what I have just referred to as an "unprincipled" building.

Take, as the antithesis to this, the Parthenon at Athens, which, of all known buildings, is one which exhibits æsthetic design carried to its highest point of perfection. I use the term "æsthetic," because it does not seem that the elaborately worked-out scheme of design referred to had any other object than the satisfying a subtle sense of beauty. Not only is the design of this temple such that both the ground-plans and the elevations must have been most carefully worked out in detail on drawings made to a large scale; but the lines which in ordinary buildings are horizontal are in this building all curved. This is the case with the steps leading to the porticos and with the lines of the entablature. And I would call your attention to the result of this system of curved lines, viz., that the joints of the masonry were radiating and not vertical planes, so that every stone in the entablature had to be designed and cut to fit its own particular position in the structure, and could be placed nowhere else.

As an example of the utilitarian principle in design, we may instance the complicated fortifications of the French and Italian engineers, the triple series of zigzag walls which formed the defence of the old Peruvian town of Cusco, and even the walls of the time-honoured fortress of Mycenæ, which showed that even at that remote prehistoric period the principle of flank defence was understood and acted upon. So in Mediæval fortresses constructed before the use of gunpowder, the battlements are made to project before the line of the wall, carried on stone brackets, between which were apertures, through which stones, melted lead, and missiles of all descriptions could be dropped on the assailants below, thus giving a vertical, as distinguished from a flank, defence.

In modern villas, built in what is facetiously called the "Castellated" style, we often see this style of parapet imitated at considerable expense as a mere meaningless ornament, perhaps masking a 14-in. lead gutter, and overhanging a conservatory whose fair owner, as she waters her flowers, thinks of nothing less than the uses for which these parapets were originally designed.

The constructive element enters largely into the principle of design. As a general rule we find that the stone architecture of Egypt, Persia, India, and Greece is based upon wooden types which must have attained a high degree of development. Take, for example, the tombs still existing in Lycia, in Asia Minor. Although built of stone they are simply imitations of wood construction, the notching of the beams upon each other being exactly imitated as well as the round poles forming the roof, as in the Turkish hut of the present day. And it is curious to observe how universal is this ornament, it being found in Etruria and in Central America, whilst even the ceilings of the rock-cut temples of Egypt are carved in imitation of the flat palm-tree roofs of an earlier time.

Take, as another instance, the front of a rock-cut temple in India. You will see that it is simply an imitation in stone of a wooden structure, with its sloping posts and wooden purlins, and the curved bamboo roof, which was the original type of the curved roof so common in India at the present day; whilst the curious ridge ornaments on the latter are simply imitations of the curved timbers placed over the domed roof to keep down the thatch, as we see great stones put on the roofs of the Swiss châlets at the present day to keep the shingles from being blown away, and as we see in the paintings on Etruscan vases of the old Etruscan huts.

All the examples I have just referred to involve the preparation of working drawings previously to their construction. But there are ancient buildings of a simpler kind, which, although built on regular principles, might have been, and probably were, constructed without working drawings, although some system of lines must have been struck out for the purpose of obtaining the templates to which the stones were worked. There is a very interesting example of this in the building known as the Treasury of Atreus at Mycenæ. The building is circular in plan, with a porch approached by a flight of steps leading down to the level of the chamber, and a square inner chamber, of which the use is unknown, the whole plan having a very curious resemblance to that of some of the Bornholm churches, with circular naves and square chancels. The principal chamber is a dome, of which the section is an equilateral arch, of which the radius is equal to the diameter of the chamber at the floor level. You will see that every course of stones had to be cut to a different angle, and the templates were probably obtained by striking out the curves on the ground with a string, and marking on them, as the work proceeded, the heights of the several courses. There is a great deal of interest about this building, which was probably both a tomb and a treasure-house, because by its means we obtain glimpses of the meaning of early myths, which are thus brought into the borderland of true history. It was lined with either brass or bronze plates, which have been removed, leaving, however, in many places the nails by which they were fastened to the walls. This was a common mode of decoration, and we find references in the Odyssey to the "brazen walls" of the palace of Alcinous.

Going back to the early history of Argos, we find that Acrisius, king of Argos, shut up his daughter Danaë in a "subterranean apartment" or "brazen tower" (one author refers to her being deomed to a "sepulchral conch") lest she should give birth to a son who should kill his grandfather. How this precaution proved ineffectual, and the mother and child were subsequently exposed on the sea in a chest, and afterwards landed safely at "Seriphus," has nothing to do with my present subject. I merely wish to point out here that the apparent contradictions in the references to the chamber in which Danaë was confined receive a complete solution in this building, which, from its early date and position at Mycenæ, may very probably have been the actual prison of the unfortunate princess.

Referring, however, to the subsequent history of Danaë and her son Perseus, I may remark that we get a glimpse of serpent or dragon worship in the story of Andromeda, daughter of King Cephus, who was chained to a rock and exposed to a sea monster by her father, in obedience to an oracle, and afterwards rescued by Perseus, who brought her and his mother Danaë with him back to Mycenæ.

It is worthy of remark that the serpent or dragon, which is typical of the religion of the Gauls, was always a water monster, and that it had to be appeased by human victims, and we have on an ancient painted vase a representation of Latona on the seashore at Delos protecting her two children from an immense serpent. So, at the taking of Troy, one of the incidents described by Virgil in his "Eneid" is the killing of Laocoön and his sons by two enormous serpents, which swam out of the sea, and, coiling round them, destroyed them.

Let us go back for a moment to the tombs of Lycia, built as direct copies of an earlier timber construction. Following the progress of Greek art through later stages, we arrive at a period when the ornamentations, although based on timber types, had passed from the phase of direct imitation to a genuine stone style. Thus, although the design of the Classical peripteral temple is evidently based on the simple rectangular stone hut, with a flat roof of round poles, covered with earth, and supported by round posts, which, to the present day, is the ordinary barn of the Turkish peasant, yet we see in the Parthenon that the triglyphs, which may be supposed to represent the ends of the cross-beams, are mere outside ornaments, and are not even carried through to the main wall of the *cella*. In this case we have passed from the "con-

* The following discourse, delivered before the Cathedral Guild of Christchurch, Canterbury, New Zealand, we received, at the request of the writer, through the hands of Mr. G. E. Street, R.A., who thought it agreeable,—and we quite concur with him,—to find men interesting themselves there in such matters. The remarks were illustrated on delivery by a number of large drawings of the several buildings referred to. Those necessary for the comprehension of the text are repeated here on a small scale. Mr. Dobson will be remembered as author of some of the papers in Weale's Series.

structive" to the "æsthetic" principle of design.

I referred just now to a scientific principle of design. I do not here allude to buildings erected for scientific purposes, such as astronomical observatories, which from their purpose demand special constructive arrangements, or to the science displayed in the construction of ordinary buildings, but to buildings which, apart from their apparent use and method of construction, contain scientific secrets, as it were, in their proportions, as completely as the historical tablets built into the walls of the Assyrian palaces or the coins which we drop into the foundation-stone of a public building to inform posterity when it shall have become a ruin of the date of its erection. Such, for instance, appears to have been the case with the great pyramid of Gizeh, which, although apparently intended for a regal tomb, seems also to have been designed as a record of a number of geometrical and astronomical facts which are expressed in the relative proportions of its different parts. So far as I am aware, the later pyramids are simply imitations of their great predecessor, and do not display any signs of the secret knowledge possessed by the builders of the tomb of Cheops.

I am afraid you will think we are a long time in coming to the Bornholm churches, but we are "beginning to burn," as the children say, and although we seem to have gone a long way round, yet we have all the time been gathering facts which will help us to understand the special significance of the little rude structures which form the ultimate object of my remarks.

Last on my list I have placed the "religious" principle of design, and let me at once explain that in using this expression I do not refer in any way to systems of proportion which may have been adopted to render a building fitted for its religious uses, but to a system of symbolic proportions, apart from, and even opposed to, those uses.

On the principle of the old proverb, "Il faut reculer pour mieux sauter," let me make one or two remarks on the leading types of architectural form.

One of the oldest types of which we have any distinct record, is the round hut with a domed roof, formed, not by straight rafters leaning against each other, but by boughs bent round into a curve and interlaced with each other. We see this form perpetuated in the sepulchral vases of the old necropolis buried at an unknown age under the tufas of Mont Albano, near Rome. It is the type of the old British hut, the design of which is clearly traced in the sites of the early British towns of which so many examples still remain. We see it sculptured on Trajan's Column at Rome; we find it alike in the kraal of the Caffir and snow-house of the Esquimaux, in the capital of Abyssinia, and in the dome of St. Sophia. It is scarcely too much to say that we find it copied in stone in the prison of Danaë at Mycenæ, in the Baptistery at Pisa, and in the round churches of which I am presently about to speak.

But with the Classic temple, which, as I have already shown, was based upon the simple type which has been handed down to the present day in Asia Minor, another class of forms grew into use in which rectangular plans and horizontal and vertical lines predominate; and it may be said that whilst in Arabia, India, and Persia, circles, interlacing curves, and serpentine lines are still leading elements of design, modern architectural design in Western Europe is essentially rectangular in character.

With the rise of Roman power arose an attempt to blend the rectangular forms of Grecian architecture with the domed type to which we have just referred; the result of which we see in the early Christian architecture of Italy, and in the round-arched churches of Western Europe. But in all this the "motive" of design is simply constructive; till, somewhere about the end of the tenth century, there sprang up a new feature, viz., the use of the equilateral triangle as a canon of proportion, the result of which was the abandonment of the round, and the introduction of the two-centred pointed arch; and this, as I shall presently show, was based upon a "symbolic" and not a "constructive" principle, which, in many instances, must have remained to the uninitiated as much a secret as the astronomical truths supposed to have been recorded in the proportions of the Great Pyramid.

There is no lack of examples of structures of which the ground-plans are of a symbolic character. The mound-builders of North America constructed huge bas-reliefs of animals, which can only be supposed to have had some religious meaning.

The tracks of the Phœnicians in Western Europe are marked by groups of stone pillars forming circles and serpentine avenues evidently connected with serpent-worship and human sacrifices. As examples I need only remind you of Abury, in Wiltshire, and Carnac, in Brittany, both temples of serpent-worship on a gigantic scale. Quite recently Dr. Phené has discovered in the Pyrennees earthen mounds similar in construction to those of North America, but emblematic of the serpent or dragon, and the churches in the neighbourhood abound in features expressive of the subversion of a pagan faith of which the dragon had been the representative. In some cases the serpent's head is marked by a church, presumably circular, but the published report of Dr. Phené's paper is too brief to give all the details that could be wished for on the subject. As, however, Dr. Phené has undertaken to read a paper on the subject at Brussels before the Pre-historic Association, we shall, no doubt, soon be in possession of a valuable addition to our scanty knowledge of the history of serpent-worship.

Soulpture connected with serpent worship is to be found throughout France and Northern Europe, and up to the present time there is a religious festival held yearly at Tarascon-sur-Rhône, in which a dragon is led captive through the streets by a girl representing St. Martha, in front of a large body of clergy, nuns, and laity, who are preceded by banners representing the virgin treading on the serpent, and St. Martha treading the Tarasque under foot, and delivering from death a child already in its mouth.

All these things point unmistakably to serpent-worship, with its human sacrifices, having been a terrible reality.

I have dwelt somewhat longer than I should otherwise have done on serpent-worship, because I think it very probable that further researches along the route frequented by the Phœnicians between Cornwall and Marseilles may bring to light many peculiarities in the churches of those districts, where we might expect to find that the circle (which, both as an emblem of the sun, and as representing the head of the serpent, was a leading form in what are commonly known as Druidical monuments) had been [retained as a constructive form after the worship of which it was an emblem had been superseded by a different faith.

It would be interesting to trace out whether the round churches built by the Knights Templars, who were always suspected of a leaning to paganism, were really designed as Christian churches; or whether they were intended secretly to perpetuate the old pagan beliefs; but at present we do not possess sufficient published data for entering upon such an investigation.

And now, after this somewhat lengthy preface, we shall be able to understand the thoroughly unique character of the Bornholm churches which form the subject of this lecture.

I may remark, for the benefit of those whose geography is a little misty, that Bornholm is a small island in the Baltic Sea, having belonged sometimes to Norway and sometimes to Denmark, but at present under the latter power, and in earlier times was often visited by pirates, on which occasion the inhabitants retreated to their churches. I refer to this, because some of the churches appear to have been loopholed for defence, which has led to a theory of their having been built as forts, and subsequently adapted as churches, an idea which is at once dispelled by an inspection of them.

There are several modern churches which are simply rectangular barns, and offer no subject for remark, except in the primitive construction of the roofs. Whether there is no long timber in the island, out of which to cut the tie-beams, I know not; but the rafters are propped up in the centre by struts resting on rough square piers of masonry, built up in the middle of the naves, and forming what we should consider most inconvenient and unsightly obstructions. This style of roof timbering seems to have been handed down for centuries, without a thought of the possibility of a more scientific mode of construction.

The earlier churches, which I am now going to describe, have all circular naves. In some the chancels are rectangular, in others the chancel walls are curved in plan; but they are all based on a rigid system of proportion, as shown by the diagram before you. And let me remark that the principle of design is not "utilitarian," for it would be difficult to imagine a building more inconvenient, or less adapted for the services of the church, than the church of Oster Lars, of which sketches are before you. It is quite true that there is a font, a pulpit, a communion-table, and rows of seats for the congregation, but very few of the congregation can see the officiating clergyman; hearing must be a matter of considerable difficulty, and the sight of the chancel is obstructed by the tower-like pier in the centre of the nave. The principle of design is not "constructive," for there is no constructive design whatever. The walls are merely built of rough rubble, and the roof is strutted up from the tower-like pier in the centre of the nave with an utter absence of anything like skilled carpentry. The principle of design is not "æsthetic," for there is not the slightest attempt at ornament or any visible system of proportion of parts intended to give pleasure to the eye. Further, this church has not been built from working drawings any more than the unprincipled building in respect of which the contractor remarked that the next time "he would chalk his staircase out on the wall." The work has been simply set out on the ground with a line, and it is doubtful whether the mason even used a square. You will, perhaps, ask, How do we know all this? The answer is very simple. If you will look carefully at the plan of Oster Lars Church, you will see that the reveals of the door openings are not squared to the walls, as would have been the case if the builder had used a square; nor do the doorways come opposite the centre of the nave, as we should have expected, and as we see in other round churches,—for example, in St. George's, at Thessalonica, a circular church with a square chancel, built A.D. 400; but they are centred on a line cutting off a segment of the nave. This fact first gave me the clue to the secret hidden in these extraordinary buildings; but it was some years before the solution of the problem presented itself to my mind.

At the present day, when we want a coloured window for the decoration of a new church, or the repair of an old one, we send an order to a tradesman, who employs a number of artists who work simply on æsthetic principles, and whose treatment of the same subject may differ widely, according to their individual taste and their knowledge of the harmony of colours. But it was not so formerly. Even at the present day at the monastery of Mount Athos, whose monks are employed in illuminating, no such liberty is allowed. Every saint has his traditional attitude; every martyr is attired in traditional colours, from which no variation or deviation is allowed.

It is difficult to find out at what date representations of the Crucifixion began to be employed in the Christian church. (You will bear in mind that the cross is not an exclusively Christian symbol, but was employed in Egypt long before the Christian era.) But when we come across the few representations of the Holy Trinity which escaped the iconoclastic fury of the Puritans, we find that they are based on canons as rigid as those which regulate the decorative talent of the monks of Mount Athos.

Here you have a very interesting specimen from a window in St. John's Church, Micklegate, York (*see illustration*). Examine it carefully and you will see that so far from its having been designed in the picturesque style adopted by our modern glass-painters, it is simply based on a geometrical diagram, by which every part of the design is rigidly fixed. And further, if you will take a pair of compasses and experiment for yourselves, you will find that the initial radius being given, every portion of the design follows in due order.

Now turn back to the plan of Oster Lars Church and you will see that it presents a repetition of this diagram, which has been traced on the ground with a line and a couple of pegs, one as a centre, the other as a tracing point, and that the walls have been built on the lines so traced, without squaring the openings or making any attempt whatever at architectural design.

The leading points given are shown very clearly in the skeleton diagram before you. You will see that this system of intersecting lines defines,—

1. The width and length of the nave.
2. The width and length of the chancel.
3. The position of the three nave windows, which typify the wounds in our Saviour's hands and feet.
4. The position of the entrance-doors, which

are centred on a line passing through the Saviour's loins, to show that through Him we enter into life.

And this at once explains the peculiar position of the doorways and the reason of the reveals not being square to the face of the walls.

It is impossible to look at these plans without the conviction that it was intended in them to illustrate the well-known passage in St. Paul's epistle to the Hebrews, x. 19-22,—"Having therefore, brethren, boldness to enter into the holiest by the blood of Jesus, by a new and living way, which he hath consecrated for us, through the veil, that is to say, his flesh; and having an High Priest over the house of God; let us draw near with a true heart in full assurance of faith, having our hearts sprinkled from an evil conscience, and our bodies washed with pure water."

I have taken Oster Lars Church for illustration, because its plan is more complicated than that of the churches with square chancels, but the principle of design is the same in all. It is difficult with the few data I possess, to fix any precise date to the Bornholm churches, but I am inclined to assign them to the early part of the eleventh century.

Many years ago I was called in to advise as to the improvement of a little church at Chaldon, in Surrey, and completed the tower and spire which had been begun in the time of Elizabeth, and left unfinished either for want of funds, or want of agreement among the parochial authorities. It is an innocent-looking church, apparently twelfth-century work, with the original roof and inserted windows of later dates. (I made a complete set of drawings of the building which are not now in my possession.) Some years afterwards, when testing the proportions of the Bornholm churches, it occurred to me to strike out their lines on the plan of Chaldon Church, and, to my surprise and delight, I found that this plain, innocent-looking building was planned on identically the same system. Of this you can satisfy yourselves at a glance by examining the ground-plan of Chaldon Church, which is before you.

But further, on examining the section of the building, I found that it was also a repetition of the ground-plan diagram, the main roof being an equilateral triangle.

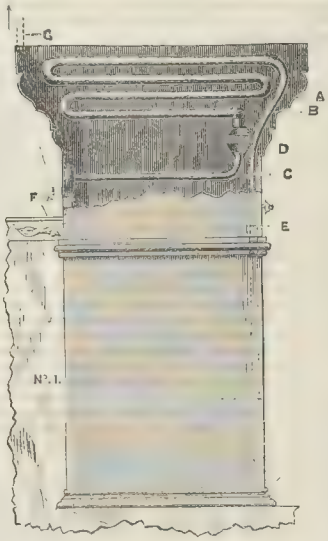
I have no doubt that an examination of the ground-plans of churches built about the eleventh and twelfth centuries would reveal that this system of lines, intended to symbolise a summary of Christian faith, was most extensively used. The fact appears to be proved by the examples I have just brought forward, which could not have had the slightest connexion with each other. How long this system of lines retained its original meaning, it is impossible to say, but from the date of the introduction of the equilateral arch, it will be found that the canon of proportion between breadth and length not only in churches and cathedrals, but in most buildings of any architectural design, is simply based on the relation between the base of an equilateral triangle and the perpendicular dropped on it from the opposite angle. Of this you may satisfy yourselves by inspection of the plans of the English cathedrals with a pair of compasses, and although, no doubt, this canon of proportion soon became a constructive axiom quite apart from its original symbolic meaning, it appears to me that its use in the first instance in Western Europe was entirely symbolic, and peculiarly and essentially Christian.

At a later date we find the essential proportions of the Bornholm churches repeated without a trace of symbolism. Take, for instance, the Church of San Thomaso in Limine, near Bergamo. The relative proportions of the nave and chancel are based on the double equilateral triangle. The circular wall in the centre of the nave of the Bornholm Church has developed into a circle of columns, and the whole building, both internally and externally, is highly decorative in character. But whilst the motive of the Bornholm church is simply and purely symbolic, that of the Italian church is at once "utilitarian," "constructive," and "æsthetic," and the symbolism has entirely dropped out. This is seen at once by the altered position of the doorways and the absence of the three windows marking the extremities of the cross.

And with this speculation I must close my remarks, trusting that the time devoted to the consideration of this hitherto curious chapter in the history of Christian art has not been unprofitably spent, and that the dissemination of the facts which I have brought before you may lead to further investigations, and to the determination of the question whether this system of symbolism was generally understood and acknowledged, or whether it was a secret confined to particular localities, or to special branches of the early Christian Church.

METHOD OF WARMING FRESH AIR.

Messrs. Robert Boyle & Son, ventilating engineers, of 64, Holborn Viaduct, are the inventors of a simple arrangement for warming the supply of fresh air admitted into rooms and public buildings. It consists of a miniature coil of pipe placed on the top part of a vertical tube as shown in diagram No. 1. A is the top of the tube, made of iron or zinc to render it fireproof, B the coil, C an air-burner, D shield perforated at the bottom to prevent the current of air passing up the tube affecting the flame; E, pipe to carry off the products of combustion; F, ¾ gas-pipe led from the most convenient source





to supply the air-burner; G shows gas-pipe brought down from a bracket. Diagram No. 2, H, regulating-valve in tube; J, air-hole through the wall; K, cast-iron grating; L, mouth of the pipe for carrying off the products of combustion. Dimensions of the air-shaft are 20 in. by 9 in. by 4½ in.

This plan has the advantage of being economical, and, with it, in conjunction with the air-pump ventilator, Messrs. Boyle say they will guarantee the satisfactory ventilation of any building without the slightest disagreeable draught being experienced.

MACHINERY AND APPLIANCES AT THE SMITHFIELD CLUB SHOW.

In connexion with the eighty-fourth annual Cattle Show of the Smithfield Club (which closes this Friday, the 9th inst.) a good collection of machinery and appliances has been brought together in and under the spacious galleries of the Agricultural Hall. The hall is very effectively lighted at night and during the dark hours of the day by the electric light, a large number of arc lights, on the Brush system, being suspended from the roof. The comfort and even the safety of visitors have been insured by the laying down of a new floor over the area of the hall, in lieu of the dangerously-rutted and dilapidated one of which visitors to the hall, in connexion with various exhibitions held there during the last two or three years, have had so much reason to complain. Stands 1 to 32, include the heavier exhibits, which are placed under the galleries, while Stands 33 to 221 are in the galleries.

At Stand 1, Messrs. Robey & Co., of Lincoln, show traction-engines, and some very good portable engines and boilers combined. Their patent "Robey" engine is of the horizontal type, and is placed beneath a horizontal boiler. Messrs. Wallis & Steevens, of Basingstoke (Stand 2), are exhibitors of portable steam-engines and agricultural machinery. Stand 3 is occupied by Messrs. Richard Garrett & Sons, of Leiston, who show portable steam-engines of good and simple construction, one of them fitted with Graham's "spark-arrester." This firm also exhibit a good horizontal double-cylinder engine. Messrs. R. Hornsby & Son, of Grantham (Stand 4), show a handy vertical engine and boiler combined, and an 8-horse power portable steam-engine, suitable for farmers, contractors, or builders. They also exhibit a horizontal engine of simple design and good workmanship, and a new patent narrow-gauge traction-engine. At Stand 5, Messrs. Barrows & Stewart, of Banbury, display a compact portable 3-horse power vertical engine and boiler, and a larger portable engine with horizontal boiler. Messrs. Hempsted & Co., of Grantham (Stand 7), show some compact vertical engines in conjunction with welded boilers. Stand 9 is occupied by the well-known firm of Clayton & Shuttleworth, Lincoln, who show a 6-horse power fixed horizontal engine, very compact and excellently finished, together with portable steam-engines for traction and other purposes. At Stand 13 Messrs. W. Allchin & Sons, of Northampton, have some good vertical and horizontal steam-engines on view. Messrs. J. & F. Howard, of Bedford, exhibit (Stand 16) "The Farmer's Engine," suitable for traction, steam-ploughing, and other purposes. Messrs. Aveling & Porter, of Rochester (Stand 17), show a ploughing-engine capable of use as an agricultural locomotive or traction-engine, and a convenient wagon for use with road locomotive, side-tipping, and capable of carrying 8 tons. At Stand 19, Messrs. W. & S. Eddington & Co., of Chelmsford and Queen Victoria-street, are exhibitors of portable engines of simple and good construction. Stand 22 is allotted to Messrs. E. R. & F. Turner, of Ipswich, who exhibit several of their specialities, among the foremost of which is their 8-h.-p. portable steam-engine, fitted with the Hartnell automatic expansion gear. It is now, we believe, some ten years since this engine was first introduced, and it has given proof of its title to hold a position in the very first rank of engines of its class. They also show a smaller-sized portable engine, 4-h.-p., of ordinary construction, very light and handy, yet strongly built. Their "Gippeswyk" engine is represented in two of its various forms, viz., as a horizontal fixed engine, and vertical with boiler combined, mounted upon four travelling wheels. The design of these engines is good, and the construction and finish leave nothing to be desired. Another of Messrs. Turner's leading specialities is corn-grinding mills, several of which are shown. At Stand 23, the Agricultural and General Machinery Company show Darby's broadside steam digger, which has been considerably improved since we saw it at the Kilburn Agricultural Show. Messrs. Ruston, Proctor, & Co., of Lincoln, show, at Stand 25,

some horizontal and portable engines of excellent design and workmanship. Messrs. Marshall, Sons, & Co. (Limited), Gainsborough, show, at Stand 27, some good horizontal and vertical engines. Stand 32 is occupied by Messrs. W. Crosskill & Sons, of Beverley, whose carts and wagons for agricultural and builders' purposes are well known.

Of the large number of exhibits in the galleries we can only notice a few. At Stand 37 Messrs. Piggott Brothers, of Bishopsgate-street, are among many exhibitors of tarpaulins, ropes, and other requisites for builders no less than for agriculturists. At Stand 59 Messrs. Lane & Reynolds are exhibitors of horizontal steam engines. At Stand 75, the Jeyes Sanitary Compounds Company exhibit their products as applied to domestic and agricultural purposes. One of their products is also devised for the preservation of wood, especially with a view to prevent the ravages of white ants in India and other countries. Stand 77 is occupied by Messrs. Croggon & Co., with galvanised iron and other tanks, wire netting, &c. Messrs. Reynolds & Co. (Stand 89) are also exhibitors of galvanised netting for sheep and game. Mr. John Bellamy, of Millwall (Stand 93), exhibits a variety of galvanised iron and other tanks, corn-bins, feeding-troughs, &c. Churns and other appliances for the dairy are shown at Stand 97 by Messrs. Thomas Bradford & Co. The St. Pancras Ironworks Company (Stand 99), have some excellent stable, cow-house, and piggery fittings on view. Messrs. G. W. Murray & Co., of Banff (Stand 105), show, amongst other things, wire-straining brackets for fencing, and chain-pumps. Messrs. Francis Morton & Co. (Limited), Liverpool, are exhibitors (Stand 111) of models of corrugated iron buildings for agricultural purposes, such as hay-barns, cattle-sheds, and covers for corn-ricks. Messrs. R. P. Taylor & Co., of London Bridge, are exhibitors of chaff-cutters, grindstones, and other useful appliances. At Stand 119, Mr. W. A. Gibbs, of Chingford, exhibits working models of his harvest-saving machinery, in the form of hay and corn dryers, to which we have on more than one occasion during the last two or three years called special attention. By the use of these or similar appliances a vast quantity of food for man and beast which has been lost owing to bad weather in recent years might have been saved. We note that a company is in course of formation for the purpose of making and selling Mr. Gibbs's valuable inventions. Messrs. Bayliss, Jones, & Bayliss, of Wolverhampton (Stand 122), are exhibitors of iron hurdles and fencing. Messrs. Hayes & Son, Stamford, show (Stand 125) some well-constructed carts for agricultural and other use. Messrs. Barford & Perkins, of Peterborough (Stand 133), are exhibitors of steam cultivating tackle, food-cooking apparatus for the stock-yard, grinding and grist mills, oil-cake crushers, &c. Stand 137 contains some well-made carts and wagons, exhibited by Messrs. W. Glover & Sons, of Warwick. Mr. E. S. Hindley, of Bourton, Dorset (Stand 138), has a large show of vertical engines and boilers, portable and of good construction; also a strongly-built horizontal engine. At Stand 165, Messrs. Hill & Smith, of Brierley Hill, show iron hurdles and fencing, including a new and ingenious sheep-folding hurdle and trough combined. At Stand 167, Messrs. Barnard & Lake, of Braintree, show a thatch-making machine, Messrs. Charles Powis & Co., of Gracechurch-street and Millwall (Stand 214), show horizontal and vertical engines of simple design and good construction.

Among the exhibitors in the Arcade entrance, are Messrs. Burney & Co., of Millwall, who exhibit iron tanks; Messrs. Crossley Brothers & Co., with their well-known "Otto" gas-engine; Messrs. T. Bradford & Co., of High Holborn, who show laundry machinery; Messrs. Rosher & Co., who show stable bricks, garden tiles, vases, &c.; Messrs. Hamilton & Co., who show pavement lights; and Lord de Blaquière, who shows his patent "detachable runners" for at once converting carriages into sleighs without taking off the wheels, and which seem to be well calculated to answer their purpose. The exhibits most interesting to builders in this arcade will be those of Messrs. Lewis & Lewis, of Laurence Pountney-lane; Messrs. F. W. Reynolds & Co., of Southwark; and Messrs. Henry Warr & Co., of Blomfield-street. Messrs. Lewis & Lewis exhibit a saw-bench and band-saw machine, both of which possess some good points. Messrs. F. W. Reynolds & Co. show some of the most useful of their specialities in the way of mortising and other wood-working machines, including their handy little contrivance for fitting a mortise-lock to a door after the latter is on its hinges. A new portable hoist for builders, which can be fixed in a minute or two by clamping it on to a scaffold-standard, is a very handy contrivance, and should be looked at. Messrs. Henry Warr & Co.'s exhibits include a new circular saw-bench with fixed spindle and rising and falling table; this is likely to be very much appreciated. They also show a new band-saw machine with the column and bed-plate cast in one; and the "Ord" patent silent gas-engine, a new aspirant for favour as a means of utilising gas as a motor.

The only exhibit which we need notice in the bazaar known as "St. Mary's Hall" is that of Messrs. Charles Powis & Co., who show some very good saw-benches.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of this association was held on the 30th ult. A paper was read by Mr. James Gordon, entitled "Architectural Notes in Normandy," giving some account of a sketching tour recently made by the author and two other members of the association in that part of France. Taking the order in which the towns on the line of route were visited, Mr. Gordon proceeded to describe the attractions which each presented to the architectural student, and the peculiarities of general design and detail of the various buildings. Rouen and Caen with their environs, Coutance and Mont St. Michel, came in for a larger share of notice, as being especially rich in objects of interest. Many other places visited were also described. Normandy, he thought, was, with perhaps the exception of the district round about Paris (the old "*domaine royale*"), the best field in which to study the beginnings and development of Gothic architecture, the wealth of examples affording abundant opportunities for comparison between the various periods. But, Mr. Gordon said, while the field in Normandy thus offered to the student quite an *embarras de richesses* most convenient for systematic study, it was not to be understood that the study of such monuments or such remnants of them as remained to us at home should be neglected. On the contrary, these were deserving of, and should first receive, the most careful study, for, although unfortunately for the most part only fragmentary, they were in no way inferior to the French examples. Few, if any, of the latter could be compared, as regards chaste refinement of detail, with what is left to us of the abbeys of Dryburgh or Dundrennan, not to mention others. The paper was illustrated by a number of sketches.

ARCHITECTS IN IRELAND.

LAMENTATIONS reach us from Dublin that there is little cohesion among the architects there, that the Irish Institute does little, and that the young men especially want some such organisation as the English Architectural Association. The *Irish Builder* writing on the subject says,—"Of course there are in London several circumstances favourable to the quicker growth of any professional organisation than there exist here; but if we lack a great area and population, and possess but a tithe of the wealth of the great metropolis across the Channel, yet no valid reason exists why we should not have a representation in architecture proportionate to the circumstances of the Irish capital. There are other considerations which ought to influence the architectural profession as well as other professions in this island. There is no doubt but the working of the Land Act will effect in a few short years a great change for the better in this country. There will be less emigration, population will increase faster, and native industries will receive an impetus, and be more widely distributed. This change, besides other improvements, spells building, and building cannot be rife without benefiting the architectural profession. It is the bounden duty of our architects to gather themselves together for the sake of their individual and collective interests, even if they lack a practical patriotic spirit, which we hope they do not. By a true representation they will not only help their own profession, but the interests of their country, social and industrial. Let the work of re-organisation commence with the new year, and let 1882 be signalised by a general awakening over the country."

There is good sense in this appeal, and we hope it will be listened to and acted on. Ireland needs the individual effort of every one of her right-thinking sons and daughters.

BREWERIES.

AT a meeting of the Society of Engineers, held on Monday evening, December 5th, in the Society's hall, Victoria-street, Westminster, Mr. Charles Horsley, president, in the chair, a paper was read by Mr. W. Barns Kinsey, "On Arrangement, Construction, and Machinery of Breweries." The author first stated the general principles which should govern the arrangement of the buildings and machinery; he then treated the subject of Wells and Water. A simple way of preventing contamination was to bore from the surface of the ground, lining the boring with cast-iron pipes, and suspending the pump within the boring, wells of considerable depth having been constructed in this manner. He next described the machinery used in brewing, which he divided into six sections,—namely, pumping, grinding, mashing, boiling, cooling, and fermenting and cleansing, stating that the simplest arrangement was by gravitation, the cold water or "liquor" being pumped to the top of the building into a vessel called a cold-liquor back, thence it flowed to the hot-liquor back to be heated, thence to the mash-tun to be mashed with the malt, from which the wort was run off through a perforated false bottom to the copper to be boiled with the hops, which were afterwards strained from it in the hop-back, and run on to the coolers and refrigerator to be cooled to the required temperature for fermentation. This, the most important process, was carried out in fermenting tuns, and the beer was either skimmed or cleansed. The use of attemperators, cleansing and union casks, together with yeast-presses, elevators and lifts, cask-washing apparatus, &c., were duly described and illustrated by models and diagrams. Lastly, the engines and boilers should be of ample power and of the simplest construction, the Lancashire double-flued boiler being most suitable for brewery work.

HILLCOTTE, SOUTH HAMPSTEAD.

THE new building estate at South Hampstead is rapidly being covered by houses of various descriptions, mostly erected from the designs of architects, and our illustration shows one of the smaller villa residences now being erected in a new road, called Netherall-terrace, running from Finchley-road (nearly opposite the Metropolitan Station of that name) to Hampstead. The walls are faced with red bricks, the upper portion being covered with vertical red plain tiling, and the roofs with Broseley tiles. Messrs. H. Saxon Snell & Son are the architects, and the cost will not exceed 2,000*l*.

EARLY ITALIAN PULPITS: PISTOIA.

THAT the construction and adornment of pulpits occupied considerably the sculptors of the thirteenth century is apparent in those found in Pistoia, Florence, and Pisa, and, in fact, throughout all Italy. The town of Pistoia is so seldom visited by strangers that its many intrinsically interesting works are comparatively unknown. Beginning with the most beautiful though the latest in date of those we have illustrated,—that is, one in the church of San Andrea,—and the one most celebrated in the history of art, the eye will be struck with the elegance and beauty of its form and work. The pulpit is hexagonal in form, sculptured by Giovanni Pisano. It resembles much that of the baptistery of Pisa, but the work is more delicate. Out of the great regard that the Pistoiese had for Niccola Pisano they confided the construction of their pulpit to his son Giovanni, who excelled his father in the delicacy of his work. The pulpit stands about 12 ft. high, and is about 21 ft. in circumference. It is supported on seven columns (in allusion to the mystical biblical number) of thin red marble from the Pisan mountains; four of these seem to have scarcely any support; three have their base, one on the shoulders of a man, a fifth on the back of a crouching lioness, the sixth on a lion with a horse under him; that in the centre is on a base flanked by two eagles and supported by a lion, all Scriptural allegorical figures. The Nativity of Jesus Christ, the Adoration of the Magi, the Massacre of the Innocents, Crucifixion, and Final

Judgment are the five stories sculptured on the pulpit, with endless variety of expression and design. Above 148 figures can be counted carved in relief, besides the beautifully worked angles, the figures in which are about 1 ft. 6 in in length. The execution of this work occupied about four years, between 1298 and 1301.

Pulpit in S. Michele at Groppoli.

To the famous pulpits of Pistoia, already mentioned, may be added one even anterior. Groppoli is three miles west of Pistoia. Crowe and Cavalcaselle write:—"One of the completest monuments of the twelfth century is the quadrangular pulpit of S. Michele at Groppoli, the faces of which represent, in low reliefs of soft stone, incidents from the New Testament." (The visitation, the nativity and flight into Egypt. A serpent at one of the angles supports the desk. The pulpit rests on columns, whose capitals are filled with heads of animals and monsters, and whose bases rest on the backs of lions. Of the latter, one paws a man, the other a dragon.) "A mutilated inscription may still be read, as follows:—'Hoc opus fecit fieri hoc opus [*sic*] Guiscardus . . . . pleb . . . . anno dñi Mil CLXXXXIIII.'"

Defective as those of Gruamons at San Andrea, in Pistoia, the figures of Groppoli are cut into the flat without any sort of rounding. The incidents are in the old traditional forms, but represented by one living in the infancy of art. The figures, like slender dolls, have draperies marked by rectangular or circular incisions. The flat square heads form but one plane with the neck; the limbs hang, as it were, by threads, together, the features being merely scratched on the surface.

About the close of the twelfth century, Buonamico seems to have been extensively employed at Pisa. Bas-reliefs, that may be assigned to him, on the curved cornice or frieze of the east gate of the baptistery, represent the Redeemer, the Virgin, and St. John, with apostles and angels. The same flat surface, the same forms, indicated by incisions, may be noted here as at Groppoli; and perfect identity of style with that of a tomb in the Campo Santo reveals the artist whose name is inscribed there:—"Opus quod videtis Bonusamicus fecit. P. eo orate."

We have enlarged on the Groppoli pulpit by quotations from Crowe and Cavalcaselle because this pulpit is a sort of starting-point in pulpit sculpture. There is one that is much earlier in Florence, of which a print has been made for Richa's work on churches. As to the inscription on the Groppoli pulpit, it is really dated 1193. Crowe and Cavalcaselle have made it 1194. The inscription reads thus:—"Hoc opus fecit fieri hoc opus [*sic*] Guiscardus.* Pleb. anno dñi, MI± CL⊙XXXXIII.†

Pulpit in the Church of San Bartolomeo.

The pulpit found in this church is by Guido da Como, who finished it in 1250, as is attested by an inscription carved on it. Prof. Ciampi thinks that Guido left it unfinished, and that two of the pictures, much inferior to the others, were by one called Turisiano. It is of white marble, carved with eight stories in bas relief,—six of which are in front, two on either side. It stands on three columns,—the first, on the left side, stands on a lion, having between his claws a basilisk, which he in vain attempts to crush; that on the right, on a lioness suckling her young; that in the centre rests on a man carved in white Seravazza marble.

By way of antiquity, after the pulpit of Groppoli, this ranks second among the Pistoian pulpits worthy of observation in the history of art.

Pulpit in the Church of San Giovanni, Pistoia.

This beautiful pulpit, of white marble, is found in the Church of St. John the Evangelist [*fuorci vita*] without the Walls. The name of the maker of it was disputed for some time; Vasari pronouncing it to be from the hands of a German artist, Professor Ciampi from those of a Lombard, and Morrona the work of Giovanni Pisano. Certain it is that the work is of the school of Niccolo Pisano, and it is now decided without doubt to be that of Fra Guglielmo, of Pisa, a Dominican monk, and pupil and fellow-worker with Niccolo Pisano. The pulpit is three-sided; and on the east side the picture has been cut to form an entrance into the pulpit. Ten different sacred stories are sculptured on the pulpit, with six apostles at the division of the compartments. In the front is the angel of the Apocalypse, under which was a face enamelled in gold, covered with a crystal. The pulpit stands on two columns, and is also supported by two brackets that come out from the wall behind. The figures are sculptured with exquisite art and tenderness, especially when the crowded grouping of the figures is considered. There is great resemblance to the Pisan baptistery pulpit. It was executed in 1270, restored in 1398 by Francesco da Siena, and in 1837 by Professor Stefano Ricci.

We shall give some particulars of Pistoia in an early number.

* The "Guiscardus" is omittted in Ciampi's account of the pulpit.

† The MI±, for "Mille," is often found thus on old inscriptions.

GENERAL POST OFFICE, BERLIN.

A separation of the Prussian Post Office from the German General Post Office having become necessary, in consequence of the momentous events which transformed Germany from a geographical expression into a political reality, it was soon found that a separate home was required for the new administrative branch of the German empire. The building of the General Post Office in the Leipziger Strasse, Berlin, which we illustrate in our present number, was completed a few years ago. It contains all the necessary offices of such an important department of the public service, besides library, postal museum, and official residences. The number of rooms for a staff of 170 officials is 136; the residences include twenty-seven rooms. The chief architect was Baurath Schwatlo, who was assisted by the sculptor Jungermann.

The General Post Office has its principal front in the Leipziger Strasse, and is a happy deviation from the old Prussian official rule of having official buildings as plain and barrack-like, and as ugly, as possible; a tendency which, we are glad to note, is rapidly disappearing in the new era of the resuscitated German empire. The edifice covers an area of 32,300 square feet, and has a depth, from the street front to that towards the garden, of 320 ft. It consists of a front building and two similar ranges behind at equal distances from each other, all three being joined together by wings, and thus forming two inner courts. The gardens at the back towards the Zimmerstrasse afford ample space for further extensions of the Post-office buildings, should they become desirable in course of time. The façade is in the style of Roman Renaissance. On a granite base, 18 ft. high, including the basement sinking 5 ft. below the pavement, rises the main building in three stories to a height of 67 ft. (with the attic story, 78 ft.), by a width of 117 ft. In the centre of this façade, between the two projectures jutting out 4 ft. beyond the line of the building, a broad vestibule is formed by the entrance-wall being placed back. The superincumbent weight of the upper stories is supported here by two powerful columns, monoliths of blackish-green syenite with sandstone capitals, and similar to those of the Tower of the Winds at Athens, upon which rests the entablature of grey sandstone.

The ground-story, 19 ft. high, has a somewhat heavy appearance on account of its severe simplicity. The windows are slightly pyramidal, the sides inclining towards each other at the top. The side walls of the vestibule are adorned with medallion reliefs of the Great Elector and Emperor William, the founders, respectively, of the Prussian and German post-offices, and the spandrels at both sides of the round-arched portal with high reliefs of two female figures, one in the act of reading, the other of writing. The first story, 16 ft. high, is of the Ionic order, elegantly treated; the windows in the projectures are flanked by Ionic columns in sandstone. There are nine windows altogether in this story, as well as in the upper story, which is also 16 ft. high. The columns, capitals, and window-piers of the latter are of the Corinthian order, with round-arched windows. The spandrels between them and the columns flanking the windows in the projectures are filled by allegorical figures of boys in relief, representing the field, money-order, letter, and parcel post. The pediments of the windows, adorned by lions' heads of the Farnese Palace pattern, are surmounted by an attic, the corners of the projectures of which are surmounted by four figures in sandstone, Mercury and a woman carrying a child on the left, and Neptune and a figure representing Science on the right. The material of the façade is sandstone from Segeberg and Nebra, of a warm reddish hue in various and fine shadings from yellow to flesh colour. The effect is pleasant, and harmonises well with the surroundings.

The vestibule opens on to a high vaulted lobby, running in a straight line to the portal giving on to the first court. Above it the two wings of the main staircase of black grey-spotted marble with gilded railings join into one flight of stairs. The corridors in all the stories are vaulted; the floors are all laid with Mettlach tiles. In the story above, fronting the street, the council-hall, 31 ft. long, 23 ft. wide, and 22 ft. high, is located. It is richly and appropriately adorned. Along its walls and in its niches are placed the busts of the Great Elector, Frederick the Great, Emperor William, and the Crown Prince of Germany, as well as those of men connected with the development of the German postal service, such as Franz von Taxis, Lamoral von Taxis, von Selgeburth, von Hardenberg, Nagler, Schmückert, von der Heydt, Bismarck. There are likewise inserted two tablets containing the names of 156 German post officials who fell in the Franco-German War. A frieze, painted by Professor Schütze, runs round the room, and contains historical compositions symbolising the whole development of written and postal intercourse from the oldest times to the present.

The architecture of the court buildings and their interior adornment are of much simpler and plainer nature than those of the façade; but their arrangements show that much has been done to ensure the comfort of the officials and of the families residing in the building. None of the rooms are less than 14 ft. high, and they are described as well lighted and ventilated. All the stories are provided with lavatories and closets, and water and gas are, of course, laid on throughout the building. The warming and ventilating apparatus (Hentschel's system) was supplied by the Neptune Company. There are in each room two ventilators, one for summer, the other for winter use, all the ventilating conduits opening into a shaft, which receives at the same time the chimney of the boiler. The gas-fittings for 1,200 lights were supplied and laid on by Messrs. Schäffer & Hanschner, of Berlin. The water-fittings were by Messrs. J. & A. Aird, of Berlin. An atmospheric telegraph (by Töpper & Schädel) connects all the rooms with the central offices by pipes, the total length of which is 20,664 ft. An underground cable connects the General Post Office with the Central Telegraph Office in the Französische Strasse.

The total cost, including the price of 34,050*l.* paid for the site, was 148,800*l.*

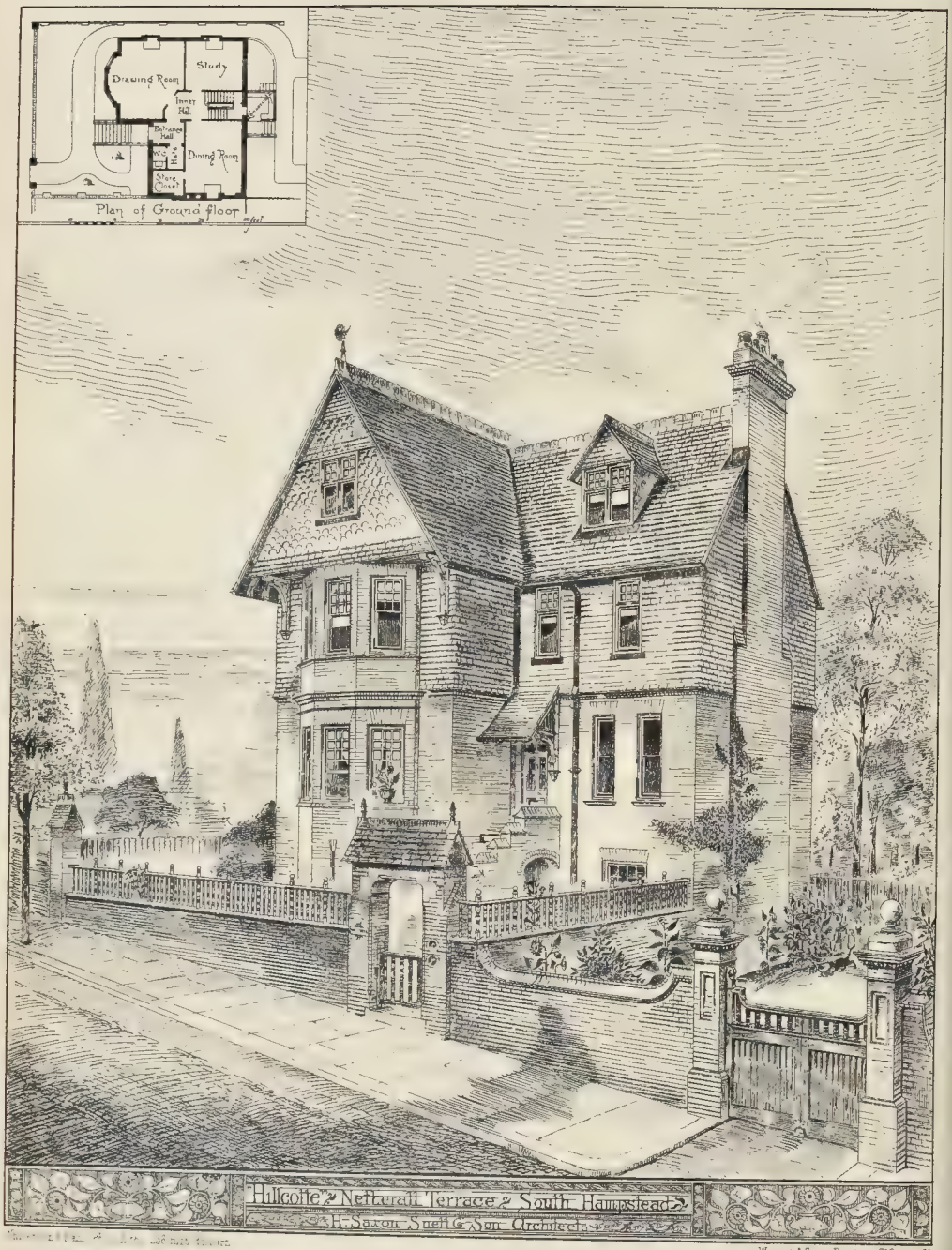
CORNER BUILDINGS AND THE LINE OF FRONT.

Sec. 75 Metropolitan Local Management Amendment Act, 1862, as applied to Corner Buildings.

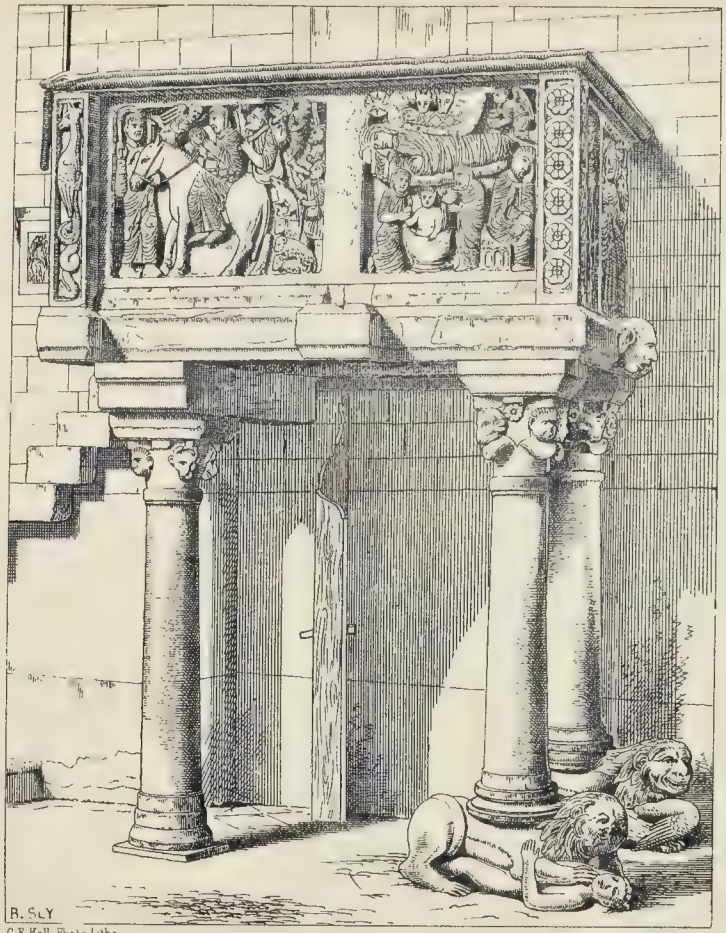
This being a matter of great importance to our readers, we feel called on to say a few words on the subject. It has hitherto been customary to erect corner buildings according to the general line of frontage in one street, namely, the principal street in which such buildings are situate, and to carry the flanks of such buildings to the pathways in the side streets; and this would appear to us to be the correct reading of the Act, for, if a purchaser of a corner plot were to be expected to adhere to the general building lines in each street, his plot of ground might be useless altogether. Some person out of mere spite might erect a row of houses at the rear of such corner plot with a general building line (say, for argument) 20 ft. from the pathway, which might be the total width of the corner plot, and in such a case the whole of such corner plot would be lost to the purchaser.

There also appears to us another reason why this section should be construed in the manner we have suggested. The words of the section are "beyond the general line of buildings in any street, place, or row of houses in which the same is situate." If two general lines of buildings were intended, the words would surely have been "*street or streets, road or roads,*" &c., and the Legislature would have made some provision for compensation in such cases, otherwise great hardship would be inflicted without a remedy.

Civil and Mechanical Engineers' Society. The opening meeting of this Society was held on the 8th inst., and the president, Mr. A. T. Walmisley, Assoc. Mem. Inst. C.E., delivered an address.

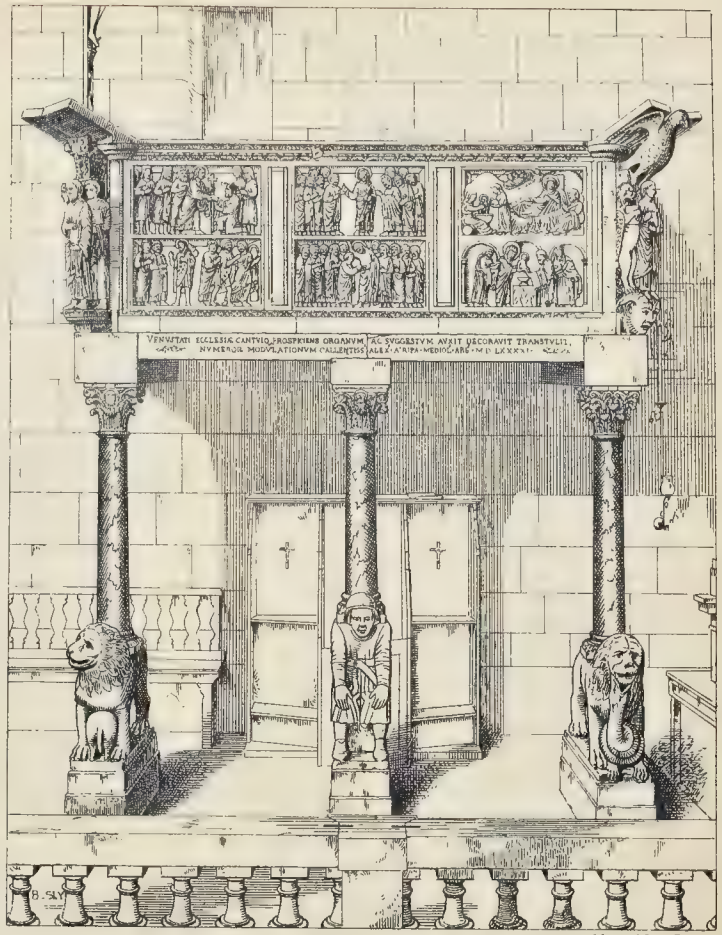


Wyman & Sons Printers, 74 Queen St.



C F Kell Photo Litho

In Church of S. Michele, Groppoli. A.D. 1193.



In Church of S. Bartolomeo, Pistoia. A.D. 1250.

Wyman & Sons Printers

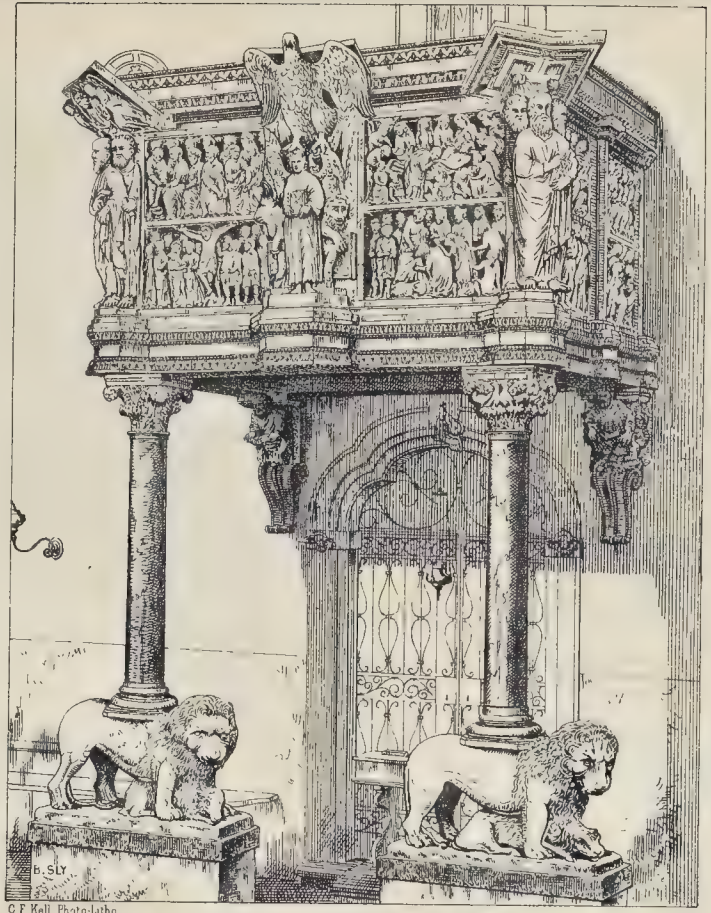
EARLY ITALIAN PULPITS.



THE GERMAN GENERAL POST OFF

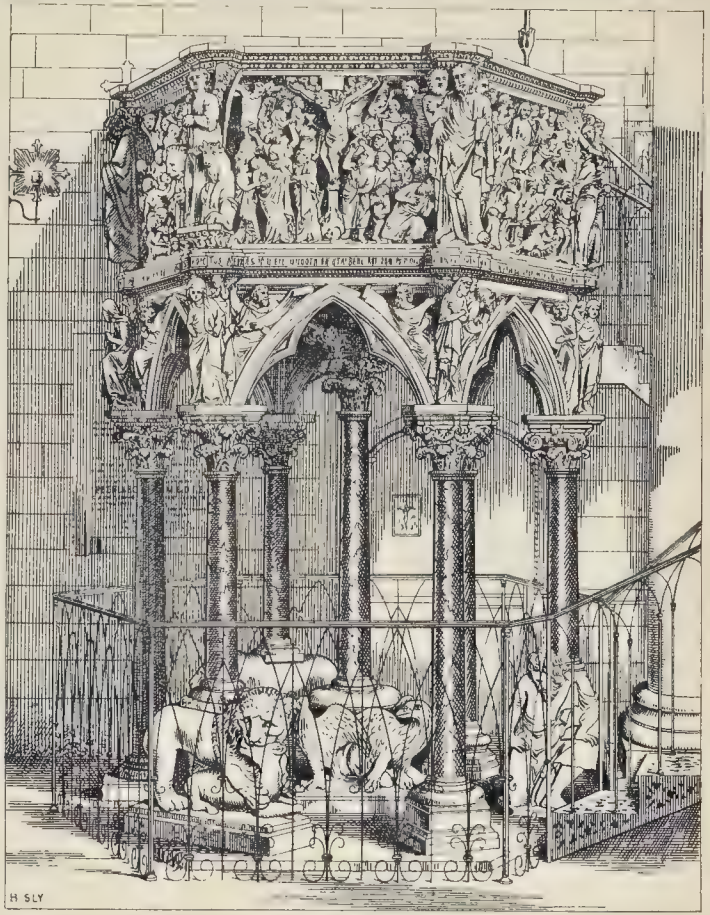


N.—Baurath Schwatlo, Architect.



C F Kell Photo-Litho

In Church of S. Giovanni, Pistoia. A.D. 1270.



In S. Andrea, Pistoia. A.D. 1298 *to* 1301.

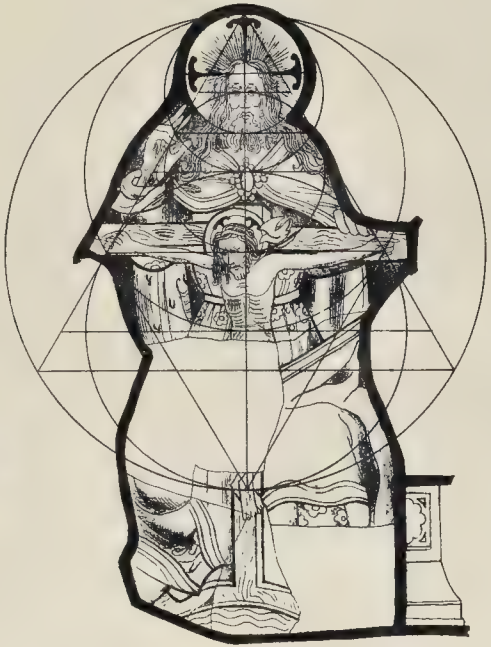
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EARLY ITALIAN PULPITS.

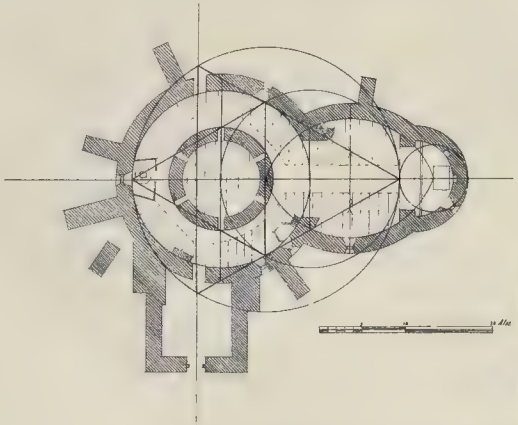
Emblem of the Trinity

From Stained Glass at St Johns Church Micklegate York 14th century
traced from Weales Papers on Architecture Vol I

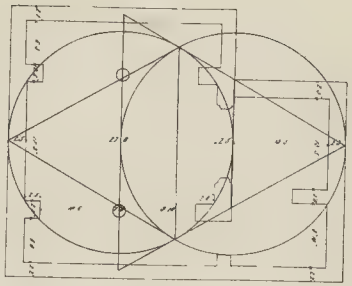
NB. The construction lines added by E Dobson



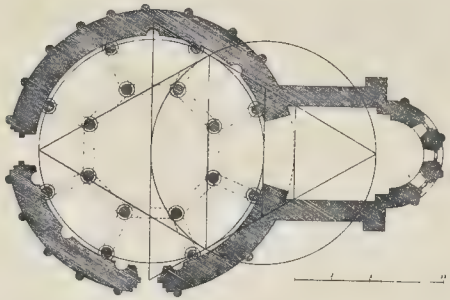
NB This plan is copied from a plate in a folio history of Bornholm published at Copenhagen
The construction lines added by E Dobson
There is a view of this Church in Fergussons
History of Architecture Vol I pg 523



Ground Plan of Oster Lars Church — BORNHOLM



Ground Plan of Chaldon Church Surrey



Ground Plan of San Thomaso in Lumine Bergamo

Whiteman & Bass Photo Litho 236 High Holborn

Wyman & Sons Printers 74 Queen St

TO ILLUSTRATE MR. DOBSON'S PAPER ON "SYMBOLISM."

THE NEW EXAMINATION, AND WHAT IT INVOLVES.*

Now that we have gained some idea of the object which the Examination may be understood as proposing to itself, and of the general course it is to take, the question still has to be answered, How will it turn out? A great deal depends upon the examining body. This consists of a board of not less than five or more than twelve Fellows of the Institute. The names of the members of the first board are as follow:—The president, Mr. Street, R.A.; the three vice-presidents, Mr. Hayter Lewis (Emeritus Professor), Mr. Horace Jones, and Mr. Ewan Christian; the honorary secretary, Mr. Macvicar Anderson; and Messrs. James Brooks, Arthur Cates, E. A. Grüning, E. H. Martineau, E. R. Robson, Alfred Waterhouse, A.R.A., and T. H. Watson. This board will, no doubt, feel bound to carry out the statement in the published programme:—"It is intended that at first the test shall not be severe." The examiners under the Building Act form a board of very similar constitution, and no doubt the useful work done by that board has influenced the decision to extend the present examination to a similar body. There will be some little difficulty in keeping the standard uniform, and there may be some trouble at first in getting so large a board into working order; but I am inclined to believe that a tolerably numerous examining body like this offers a safeguard to students against violent fluctuations. If from year to year new men are elected to replace the retiring members, still the majority of the board will remain from one examination to another; traditions will, to a certain extent, establish themselves; and, in all probability, a tolerably uniform standard and mode of procedure will be preserved. The first examinations will be looked forward to with great interest; and to pass on one of the earlier occasions will, no doubt, reflect credit, and even distinction, on those who do so. Very many gentlemen who might, one would have thought, have been sure of success, have preferred to enter on the old principle, but some of them will, I believe, come to regret that they had not more confidence in their own powers. It would perhaps be a wise thing if, for two or three years, the examination was, so to speak, made retrospective, that is to say, thrown open to gentlemen already Associates, so that some of those now in the body might have the opportunity of adding what will, no doubt, be a real distinction to their names. Of all the things which may be said to be involved in the new examination, nothing is so self-evident as that it must be prepared for, and that this Association possesses the means of aiding in that preparation to a very large extent. Three sorts of preparation may be very easily recognised, as all useful, in fact, necessary. First, that practical acquisition of professional knowledge, and the power to make plans and perspectives, which is gained in an office and on the works, in practice on one's own account, or as an assistant or pupil. No one must hope to pass such an examining body as that Board at Conduit-street unless he has had sufficient practical training to enable him to do all the routine work of an architect's business, and some, at least, of the exceptional work. No one could, I imagine, go up from college, or classes, or any sort of instruction that is purely theoretical, and hope to succeed, any more than a medical student could pass his examination without having walked the hospital; and it will hardly be easy for those who have never done any work on their own responsibility to master this, the practitioner's, side of the qualifications sufficiently for success. Secondly, there is theoretical knowledge of materials and construction, of history, and of what one may call the theoretical drawing, so far as the details of one style go. This must, equally with practical routine, be mastered, and for the acquisition of this, pupilage and practice neither of them supplies much opportunity. Classes and lectures, and private study, must be used with the view of learning theory. Thirdly, and by no means of least importance, there is practice in answering papers of questions, and in replying to a *viva voce* examination,—in short, the skill to use the knowledge acquired. I propose to say something on each of these three heads. First, as to what we have termed the routine of practice. The greater number of those who are likely to desire to become Associates are probably more likely to be familiar with this than to be quite safe in either of the other two branches of preparation. Sharing for some years in actual work, or in carrying out a single building of one's own, will give good opportunities for becoming familiar with an architect's work; and the only hint, perhaps, that need be given, is to suggest to gentlemen who are pupils and assistants the importance of keeping their attention awake to all that goes on within their reach. The practical subjects which are most accessible to one man will be least so to another; but, on the whole, dealing with ruinous and dangerous structures, and planning for special purposes, appear to be the two most likely to lie a little wide of the range of many architects' pupils. As to the ruinous structures, they, as I have already hinted, occur from time to time, and if a young man is on the look out for information, he may be able to learn a good deal even from a single case of this sort. As to designing, that is mainly learned by practice. Any one can exercise himself in planning if he pleases, especially now that so many prizes are open for such work. But on this part of preparation, let me point out that the recent formation of a class for the study of planning and specification writing, and the two Classes of Construction and Practice, ought to aid members of the Association very materially in their acquisition and systematising of what may be termed practical knowledge. Perhaps it would be right to add the hint that some acquaintance with iron construction will probably be expected now that we have fairly entered the last quarter of the nineteenth century. The candidate at such an examination ought, at least, to be prepared to sketch iron beams correctly, and calculate their sections, in addition to being familiar with timber, brick, and stone construction. The second part of my suggestions as to preparation for the examination referred to Theoretical Knowledge. Here, I think, there is room for a great deal of improvement in our methods of instruction, and I venture, even at the risk of giving offence, to say that much of our modern architecture has suffered in consequence of defects in this instruction. Probably the greatest service which the examinations can possibly render will be their causing many pupils and others to learn something of the history of our art, and to acquaint themselves minutely with a little bit, at any rate, of that art. My own profound impression is that a good, familiar knowledge of some of these things is of the greatest possible value to the architect, and that the question whether he shall rise or not in his profession depends upon his mastering a few things, which he does not see are likely to be immediately useful,—such, for example, as drawing the human figure, in addition to the things of which he has need at the moment. But many of the younger among us do not seem deeply penetrated with this idea, and for them it will, as I have hinted in an earlier part of the paper, turn out to be a great advantage that now something has arisen which will compel a little attention to theory, and art history and architectural study of the higher kind. This, however, is a digression; the immediate subject before us is to find out how history and the science of construction must be studied, and your committee has, very wisely,—as I, at least, who am myself an instructor, must admit,—determined that some direct instruction shall be afforded here in these subjects. You are, of course, all of you, aware that two courses of lectures, one of which is to be a kind of companion to the subjects in the Elementary Class of Design, and the other similarly to accompany the subjects in the Elementary Class of Construction, are arranged, and indeed have already begun, with every promise of success. I do not think these subjects could have been entrusted to better hands than those of Mr. Tarver and Mr. Blashill respectively, and the only thing to be regretted is, that it was not possible to make each course longer. Still, as the lectures are delivered at considerable intervals of time, as they are associated with the subjects for study in the two classes, and as it will be possible for you, if you are industrious, to carry your study of each subject further than Mr. Blashill or Mr. Tarver can, within the space of an hour's lecture, take you, these courses may enable you to acquire a very considerable amount of knowledge respecting the subjects treated of. Mr. Tarver's series includes, after his introductory lecture, all those styles (or at least the most prominent of them) which combine to connect the work of the present day with that of the most artistic nation on the face of the earth. The Greeks fixed for all time a very large part of the architecture of civilised communities. Not that we, or those who went before us, are wise if we attempt to build in Greek, but that each style has been founded on the one which preceded it, and all alike inherit from Greek originals most of their features. The Roman, we all know, was a coarse rendering of Greek art, with the addition of the arch. The Romanesque, Byzantine, Lombard, and Rhenish are all children of Rome. The Gothic styles are their immediate descendants, and the Renaissance, the last in the series of Mr. Tarver's subjects, is a return to Roman forms, animated by a modern spirit. This is the tale of architectural history, as it affects ourselves, told in a sentence, and I sincerely hope you will all hear it told far more completely in Mr. Tarver's class. Not less comprehensive is the scheme of Mr. Blashill's constructive lectures. The first two relate to the foundations and walls of a fabric, the subjects being excavator, bricklayer, and mason. The next two relate to the completion of its carcass, namely the work of the carpenter and the tiler, and they take in that of the plasterer. The remaining four take in the most important parts of the finishing of a building,—those of the joiner and ironmonger, smith, plumber, painter, and glazier. Under the head of plumbing you may be sure that you will, from Mr. Blashill, not only get some advice as to the construction of flats and gutters, and so forth, but an account of those methods to which I have already had occasion to make allusion, that modern skill has brought to bear on the sanitary condition of dwelling-houses. The plumber has heavy responsibilities upon him; not only has he in times past set fire to many a cathedral spire and roof, but in our own days his shortcomings have been followed by disease and fatality. How to deal properly with plumber's work means really the management of water-supply, of drainage, and of sanitary fittings,—in short, the protection of the inmates of a dwelling from sewer-gas. Perhaps it may not be out of place if I add the suggestion to members able to attend these courses of lectures, that they will be wise to take the opportunity this session, and not to postpone their attendance till another. The courses may possibly not be repeated; or, if repeated, they may be in a different mould. The opportunity is presented now, and is a very valuable one, and no one will regret the very moderate fee, and the very moderate sacrifice of time which attendance on both these series of lectures would involve; and even though one in the Construction course and two in the Art course are already given, that circumstance will not prevent attendance upon the remainder from being most desirable. The third point to which I drew attention was practice in examinations. It is possibly a weak point in the Architectural Association system that there is not a system of examinations connected with it. The experience of University College shows conclusively that the examination at the end of the session acts as a stimulus, and also helps the student to gain a command over his own resources and his own acquirements. And though I feel that I am more fortunate than my two friends just named, not only in having to treat substantially the same series of subjects in three times as many lectures, but also in having an examination and conspicuous prizes to point to, I cannot but see that the Association, if it chose, might do more than it is easy for University College to attempt in the way of examination-practice, if I may use such a word. No one can do full justice to what he knows in an examination, whether by papers or *viva voce*, unless he be somewhat in the habit of answering questions, and answering them, so to speak, under pressure. The members of your new History Class, and those of the Construction Class, will probably, both of them, have an opportunity of attending an examination, or perhaps more than one, and they will be wise if they all avail themselves of that opportunity when it comes, and prepare for it well beforehand. In addition to this, however, some arrangement to afford practice in answering an examination paper on architectural subjects, within a certain limit of time, and without turning to books of reference, if it could be managed, would be very serviceable to intending candidates, as tending to give them confidence, and to show to them where their weak points lie, in time to apply a remedy. Such an arrangement would be quite practicable here, and would surely be worth attempting. One measure which has been from time to time strongly advocated in this Association is cer-

* By Professor T. Roger Smith. (See p. 691, *ante*.)

tainly closely allied to the New Examination, but is not involved in it. I allude to a diploma for architects. The two things resemble one another so much that we are apt to forget how widely they differ. It is not unlikely,—at any rate, not impossible,—that the new examination may be found to afford the chief advantages of a diploma without some of its obvious disadvantages. Take, for example, the difficulty of deciding what is, and what is not, to be prohibited if a diploma is granted. The only act which could well be taken hold of is the certifying for advances or payments to a builder; and this, it is obvious, has to be done by engineers, naval architects, and many other classes of practitioners, so that a prohibition could be readily evaded. But if the result of the examination is to establish publicly that the Associates of the Institute are a body of architects in whom the public can place confidence, it may very possibly turn out that Associateship will be sought by every architect of skill sufficient to pass the examination, and will be accepted by the public as equivalent to a diploma. It may, on the other hand, very possibly pave the way for the grant of such a document. At any rate, what we have to consider to-night is not the diploma question, but the examination question. If once we recognise that, quite apart from any other measures or ulterior consequences, the examination ought to result in raising the status of architects, in procuring a better estimation of them by the public, and in rendering them more really deserving of public confidence, we surely must recognise something which we are glad to see established, and which we feel ourselves bound to support, by promoting the candidature of the best men in the Association, and by assisting them in the preparation. It must not be forgotten, in conclusion, that, like every untried measure or new departure, this examination is an experiment, and may fail. One serious, or at least possible, risk of failure seems to lie in the fact that so many young men have avoided the examination by becoming Associates under the old rule. The result may very possibly be that fewer candidates will, at first, be forthcoming than there ought to be; but I have every confidence that even if this is so, the Institute will persevere, and that the good sense of young architects will make them soon come forward in sufficient numbers. There can, in that case, be no doubt of success. Were the examinations to fail, the failure would throw us back twenty years, perhaps fifty years. On the other hand, if they succeed, we shall see established in our midst what ought, under good management, to prove a powerful agency for good. The consequences ought to be better education and greater skill. The architect's fitness for his work ought to be at once more assured and better recognised. The general estimation in which our profession is held by the public ought to be proportionably raised. Let us all, each one as he can, endeavour to contribute to this result.

In the discussion which followed,

The President (Mr. Aston Webb) said he thought all the members would agree with him in thinking that Professor Smith's paper was a most valuable and useful one. The Association was glad of that opportunity of congratulating the author upon the fact that he was now the Professor of Architecture at University College. All who intended to go in for the New Examination could not but feel that it was of great advantage to them to have the hints and advice which Professor Smith had given them with so much authority and, at the same time, with so much kindness. The partial failure of the Voluntary Examinations at the Institute tended to raise some doubts as to whether the new Obligatory Examination would be as successful as could be desired, but whatever might be its success or failure, the Association had done, was doing, and would continue to do, everything in its power to make it a grand success, feeling that if it were so it must be to the advantage of the profession. He was glad to say that there was a large number of the members of the Association who were prepared to go in for the new Examination in due course. He thought, however, that one mistake as to a point of detail had been made, and that was in its having been arranged that the first obligatory examination was to be held some time in the next spring, before the Association's special courses of lectures were over, and before the courses at the University and King's Colleges were completed. He did not know whether that arrangement could be altered now, but he certainly thought it would be desirable to postpone the first examination until much later in the year,—to the time, in fact, when it was proposed to hold the second examination. Much,—very much,—depended on the first examination being successful. Professor Smith had stated that the object which the examiners would keep before them would be to make the examination of such a character as to ensure that the men who passed should be competent to practise as soon as they had passed. If that was the case, it would add to the value of the examination, but would also add to the responsibility of the Institute.

Mr. W. A. Pite said they had been gratified at hearing the Examiners' and Professor's view of the question, but the students' view of the subject must not be lost sight of. He thought that students had been "whipped-up" to the proposed examination a good deal. They had been assured that to pass it would be to gain a very great prize, but, after all, now that the syllabus was published, it did not appear to him that those who succeeded in passing would do anything very great. It seemed to him that when a man had passed it he would not be anything extraordinary. He would only be an ordinary architect, or a decent building surveyor with a dash of art thrown in. For his own part, he was of opinion that the Examination ought to be more full,—indeed, much fuller, with regard to art,—and he should like to see 500 out of the possible 600 marks attainable devoted to art. He moved a vote of thanks to Professor Smith for his able paper.

Mr. Blashill, in seconding the motion, spoke of the services which Mr. Douglass Mathews had rendered in bringing about the examination. The passing of the Examination would be most valuable not only to those who intended practising for themselves, but to those who intended to act as assistants.

Mr. Vacher, in supporting the motion, said he hoped that those who succeeded in passing the Examination would not, if they applied to architects for employment, have their superior claims passed over, as had been done within his own experience in the case of some of those who had passed the Voluntary Examination. He hoped that the examiners would discourage eccentricity in design.

Mr. S. Steward Smith (of Reading), Mr. F. H. A. Hardcastle, and Mr. J. Douglass Mathews having each made a few observations,

Professor Roger Smith, in replying on the discussion, observed that he did not think the grounds put forward by the President were sufficient to warrant the postponement of the first Obligatory Examination. Notice had been given of what was intended for the last two years, and the programme had been published some months ago. The question had been raised whether the certificate of having passed the Examination would necessarily imply perfect fitness to practise the profession as an architect. No doubt the public would so regard it, but the Examination merely professed to ascertain the qualifications of candidates for admission into the membership of the central society of the profession. There would be less difficulty in the present tolerant age in obtaining impartial judgments on questions of art from the Examiners. "Eccentric" designs would not necessarily be rejected unless they were accompanied by marked defects in planning and construction. As to the relative proportion of marks required to be obtained by the candidates in each section, he thought, as the prospectus of the Examination was at present worded, the candidate would be entitled to pass if he obtained 300 marks, however distributed, out of the maximum of 600. Possibly the Examiners would, after a time, prescribe the minimum number of marks to be gained in each subject.

SURVEYORSHIP ITEMS.

Bridgwater.—There were ninety-nine applications for the post of borough surveyor, from which a selection of four was made, viz:—Mr. Franklin, Reading; Mr. Baker, Malden; Mr. Laffan, Croydon; and Mr. Tylecote, Halifax. These gentlemen were interviewed by the council at their meeting on the 2nd inst., and Mr. Laffan was appointed.

Finchley Local Board of Health.—Francis J. Bancroft (Highways Department, Islington Vestry) was, on Monday last, selected for the position of junior in the surveyor's office of this local board.

OUR CATHEDRALS.

Sir,—My completion this past summer of a tour (carried on at intervals over a few years) of all the English and Welsh cathedrals seemed an appropriate occasion for gathering up into a paragraph or two for the pages of your valuable journal some of those notes and queries suggested to my mind by the present condition of these interesting fabrics,—and while I am well aware that the same worth cannot attach to these comments as if they came from the pen of a more competent writer, yet, if you will kindly allow them space, I think they may prove acceptable to some of your readers, and perhaps elicit a little information.

Closely linked with the remembrance of *Bristol* is a strong feeling of commendation for the energy displayed in bringing to a completion the building of an entire nave, probably the most important work among our cathedrals which this generation has witnessed. One would like to see the three towers finished, giving a distinctive character to the exterior. There is a movement just now on foot to bring the south-west tower up to the level of its fellow; but what of the pinnacles and parapet of the tower at the crossing; where are they gone and in what manner are they to be replaced? And what hope is there of the general exterior being cleaned, which is so much needed? Is the considerable remaining cloister to be restored and rebuilt as a quadrangle?

Lincoln.—The general condition of this glorious minster at present calls loudly for attention to other parts besides the west front. The nave and transept vaultings, so beautiful in design, need cleaning, and unless the eye deceives, they are covered with plaster, which would account for the many cracks discernible. May it not have been left for the builders of our own time to complete the cloister, after first sweeping away the utterly worthless Classic addition? The interior stonework of the chapter-house does not strike one as being in a good state of preservation.

Bangor.—This little cathedral, so ungainly in days gone by, presents now a really handsome appearance within. It is a pity that the exterior is not yet adorned with a completed central tower, even if it be without that pyramid of slate shown in the design. The canopies and stalls in the choir are very effective, and a credit to the present school of wood-carving. A reredos is still wanting.

York.—A visitor to the minster, strongly impressed with the conventional preference for this particular cathedral, will probably find that its splendid exterior comes up to all his expectations. Within, a glorious ideal is presented; but how faulty are many of the details. The vaulting over the nave, for instance; the absence of any vaulting beneath the western towers,—indications that the complete realisation of the original conception is still left to a future day.

Rochester.—Much has been done in the choir and transepts, with happy results. It is a pity for the hands of the restorer to be stayed just at this stage. Most of the eastern gables want correspondingly high-pitched roofs, and Mr. Cottingham's tower at the crossing may have to be improved away. So much the better. It is stated that a new central tower is seriously contemplated. One of worthy design would largely contribute to make this building what it certainly is not at present,—externally pleasing.

St. David's.—The many who have not made a pilgrimage to this rather inaccessible little city, but yet feel an interest in the ancient fabric, which is the finest and largest of the Welsh cathedrals, will be glad to hear of repairing works successfully carried through, not a bit too soon. Much, of course, still remains untouched. How far it may have been an advantage to take out the great west window, in the Debased Perpendicular style, to be replaced by modern Norman lights as a memorial to Bishop Thirlwall, is a question on which there will be two opinions. As to the fittings, it is lamentable to come across fragments of the old organ lying about which have been in the same position for years, and to learn that funds are not forthcoming to rebuild it or erect a new one. Fortunately no other cathedral in England and Wales is without an organ.

Salisbury.—Generally speaking, it will be matter for congratulation that the works of restoration have left this cathedral in, to say the least, a state of good repair. No one is

likely to regret the removal of very poor stall-work and canopies from the choir; but *apropos* of the present handsome stalls, are they not to have canopies? Salisbury, from the peculiar lightness of its architecture, and on account of its numerous windows, strikes one as being a particularly cold cathedral, and a row of delicately-carved canopies would give a warmer aspect to the choir. It is to be hoped the double organ will be supplied with cases before long, or treated after the same system of decoration as the instrument at Durham.

Chichester.—Part of the design of the reredos has still to be carried out. Here, again, the question must be asked, how long the very prominent skeleton of the organ is to remain unclothed? And what a pleasing feature this might be made in its pendent position from the north wall of the choir,—a counterpart to that at Ely.

Chester.—After such a transformation as has been carried out here, it may seem too much to expect further effort just now; but the condition of the south transept externally cannot fail to be a general eyesore, and the completion of the south-west tower would greatly improve the effect of the west front.

Gloucester. — The organ surmounting the screen, and which is so conspicuous looking down the nave, is an incongruous, if not ugly, object here, with its three uprights with flattened heads. Something of the lightness of design adopted for the case at Lincoln might be an improvement. Others have suggested dividing the organ; but, would this cathedral look well with an almost unbroken vista, considering the contrast between nave and choir?

Hereford.—Mr. Wyatt's feeble west front is surely doomed for some future day, and perhaps the present generation may live to see a western tower in its place, as in years gone by. It may be remembered that the subject was revived at the last triennial festival in this city.

The general impression left on the mind after a ramble among the cathedrals is that there are very many comparatively trifling works, finishing touches, which through long years have still remained unaccomplished. Is there not some want of energy now-a-days in persevering to the end of great undertakings? How disappointing it is to revisit some grand minster after a long absence, and find still the unchiselled blocks or the temporary fittings; and how lamentably common it now seems to be to leave off at the first stage of a tower, so that for half a century or more it becomes a by-word that "these men began to build, and were not able to finish." Of course the excuse is the pecuniary difficulty; but let it once be realised that this is a *public*, and not exclusively *church*, work, and English money will not be far behind English spirit in the common cause. Art is, in its many forms, more cultivated now than in the past; and whatever may be said in disparagement of "Victorian Gothic," still there is no doubt that this age has, to a large degree, been imbued with the genuine feeling of the old cathedral builders. Now is the time, then, for fresh effort, before the capricious fashions in art-taste dictate the special worship of some other style in architecture, and our children, perchance, turn out to be as bad "Gothic" distorters as were their grand-parents. But a little reverent care, a season of patient labour, and we shall be able to leave to posterity, in unimpaired splendour, those cathedrals which are such an ornament to our country, while we may with affection and with pardonable pride inscribe upon their walls the legend that I yesterday read over a porch in Wimborne Minster:—"Our holy and our beautiful house in which our fathers worshipped."

D. JOHN D. CONNER.

THE INTERNATIONAL EXHIBITION OF SMOKE-PREVENTING APPLIANCES.

THIS Exhibition has now been open for more than a week, and is in fairly complete order, although a blank space here and there shows that some would-be exhibitors are either very dilatory or very unfortunate in not being able to take up the positions allotted to them. We have authority for stating that the executive committee will be glad to entertain proposals for receiving and exhibiting (even if only during the last week of the Exhibition) any novelties in the way of inventions or processes which come strictly within the scope of the exhibition, the object of the committee being to elicit information on the subject of smoke-prevention and fuel-economising. We are glad to learn that the attendance of visitors has so far been very good, and in excess of anticipations. The fact may be usefully noted that the Exhibition will remain open every week-day until further notice from 10 a.m. to 10 p.m. We trust that it will be largely visited by our readers, especially by architects, builders, and manufacturers. We have no doubt whatever that in the attainment of the ends which the promoters of the Smoke Abatement Exhibition desiderate, not only will health be promoted, but fortunes will be made by those who succeed in perfecting, and saved by those who adopt, stoves and furnaces which shall not only consume their own smoke, but which shall be far more effective, in proportion to the heating power stored in the fuel, than are most of the appliances in common use at the present day.

We take this opportunity of mentioning one or two exhibits in addition to those already referred to. Messrs. Rosser & Russell (Block XVIII.) exhibit the "Leopold" reversible or revolving grate, which consists of a circular cage or fuel basket revolving on a pivot. It is fitted with two hinged gratings, so that whichever grating is uppermost can be opened for the admission of fresh fuel, which by a half-revolution of the basket will be brought under the lighted fuel so as to consume the smoke and gases evolved from the fresh fuel. This firm also show their warm-air ventilating grate, and a cooking-range, hot-closet, and heating apparatus. Mr. Thomas Goodchild, F.R.I.B.A., exhibits, at the north end of the eastern arcade, a full-size drawing of his "Economic" stove, patented by him, we understand, in 1857, but the patent of which he allowed to lapse. It is strikingly like another stove more recently patented, and shown in another part of the Exhibition. At the north end of the western arcade Messrs. Mintons exhibit a drawing showing plan and section of patent smokeless pottery ovens, which appear to be not only admirably adapted for preventing smoke, but for keeping the temperature easily under control. We mentioned last week that the conservatory is illuminated by the Siemens gas-burners. A description of this ingenious invention would not be intelligible in few words unless accompanied by a section, but we may say that it is based upon the principle of the regenerative gas furnaces almost universally used in the smelting districts, and known to all as the Siemens furnaces. It is claimed that from this burner can be obtained with equal facility and economy lights varying from 30 to 1,000 candle-power, but it is in contemplation to construct both larger and smaller sizes.

THE FALL OF A HOUSE AT MAIDA VALE.

IN regard to this casualty, reported by us three weeks ago (see p. 650, *ante*), the Building Act Committee of the Metropolitan Board of Works presented the following report at the meeting of the Board on the 2nd inst.:—

"The Board on Friday last referred to your committee a letter from Mr. G. Lushington, Home Office, dated 17th of November, 1881, with a letter from Mr. T. H. J. Shadwell, relative to the fall of a half-finished house and shop in Clifton-road, Maida-vale. Your committee have received from your Superintending Architect a report upon the subject, prepared in pursuance of the resolution of the Board, and also a report from Mr. Horace Gundry, the District Surveyor for Paddington. The house in question was the westernmost of a block of four in course of erection on the north side of Clifton-road, and it fell suddenly between five and six o'clock on the afternoon of Saturday, the 12th ult. The bricks were of fair quality, and the mortar, which was composed of lime and brick-rubbish mixed in a pug-mill, as required by the Board's By-law, was hard, but deficient in grit. It appears that a kind of dumb well was formed on the site to receive the surface-water, and that a drain was taken from this well to the sewer in Clifton-road. The mouth of this drain was about 3 ft. from the south-west angle of the fallen house, and was below the level of the concrete under the party-wall. Your Superintending Architect is of opinion that the fall of the house is not to be attributed to the use of improper materials or defective workmanship, but that the accident was occasioned by the excavation for the drain at the south-west angle of the house, the water collecting in which so saturated the soil as to cause it to subside under the weight of the south quoin of the party-wall, and the slipping or failure of this quoin brought down the house. Your committee, therefore, recommend that the Home Secretary be informed in accordance with the foregoing report, and that they be authorised to consider the advisability of inserting a clause in the proposed Bill for the amendment of the Building Act, requiring all drains to houses to be laid in before the walls are commenced, and the junctions made and the excavations filled in to the satisfaction of the District Surveyor; and a further clause requiring, in the case of quoins of party-walls and piers carrying heavy weights, that the depth and width of the concrete be increased beyond the dimensions set out in the Metropolis Management and Building Acts, 1878."

The report (which bears out the remarks we have already made) was adopted without discussion, on the formal motion of Mr. Ebenezer Saunders, chairman of the committee.

ALHAMBRA THEATRE, LEICESTER-SQUARE.

SPEAKING, last week, of the re-opening of this well-known building, we said the dome was to be illuminated by the electric light, and that we would report on the effect. Certainly the effect was very striking. In place of the dark and dingy void heretofore seen on looking up, the dome now presents the aspect of a bright blue sky, "fretted with golden fires." The light consists of four of Siemens's arc lights, the dynamo-machine of which is driven by one of Tangye's steam-engines. These lights are enclosed in a stained-glass lantern, which produces a jewelled effect, and sends a warm light down on the auditorium, whilst the pure white light which is thrown upwards on the glittering surface of the dome, is diffused by reflection throughout the building.

The coloured decorations throughout have been renewed with good taste. The principal structural works which have been undertaken consist of the widening of the proscenium, the improvement of the accesses and staircases to the stalls, and an examination and strengthening of the main timbers and supports of the building. The width of the old proscenium had been limited by two of the iron columns supporting the main roof, but these have now been removed, and new and more substantial columns, carrying a deep iron girder under the base of the dome, have been substituted. The operation was an extremely delicate one, and required a profusion of solid shoring over the stage, which, together with the forest of scaffolding raised for the painting of the dome, produced to those who knew the building a most peculiar appearance. We may hereafter be able to describe and illustrate this operation. The result of this alteration has been to widen the proscenium, structurally, some 10 ft., but, unfortunately, for want of time, the benefit of this is not yet apparent to the public, and the old proscenium screen has been left in position until a new one, more in accordance with the style of the house, can be prepared. The floor of the stalls has been raised slightly, and the next improvement should be the lowering of the floor of the orchestra so that the popular and portly conductor, Mr. Jacobi, and sundry bass viols, may no longer intervene between the spectators and the actors. The works to the stage have included the completion of a fire-proof concrete screen between the stage and the auditorium.

Advantage was taken of the closing of the house thoroughly to overhaul the whole of the construction, and the directors called in a civil engineer, Professor Kennedy, of University College, to consult with their architects on the subject. The result has been that considerable works for the strengthening of the dome have been done, and means taken to ensure the safety of the fabric.

All the works were done by the contractor, Mr. Brass, of Old-street, St. Luke's, with the assistance of his foreman, Mr. Jones, for the constructional work; and his sub-contractor, Mr. W. Homann, for the decoration. The upholstery and carpeting have been supplied by Messrs. Tyler & Son. The stained glass lantern for the electric light was manufactured by Messrs. Pitman & Son. The contract was completed within the time agreed upon, the men working day and night in alternate gangs, and the whole of the works were done from the designs and under the superintendence of

Messrs. Perry & Reed, of 9, John-street, Adelphi, the architects to the theatre.

The house was re-opened on Saturday last, the 3rd inst., with the spectacular opera "Black Crook," produced with great splendour and complete success.

UNDERGROUND DWELLINGS IN LONDON.

At the meeting of the Metropolitan Board of Works, on the 2nd inst., the Building Act Committee brought up the following report:—

"In pursuance of the Board's resolution of the 11th of November, your committee have considered the question of the duties of District Surveyors under section 103 of the 18 & 19 Vict., cap. 120, in reference to rooms in the basements of buildings used as dwellings. From a report presented to your committee by your Solicitor and Superintending Architect, it appears that each District Surveyor is bound to report to the Board, and also to the District Board or Vestry, in the months of June and December in every year, and at all other times when required so to do by the Board or Vestry, any room of a house in his district the surface of the floor of which is more than 3 ft. below the surface of the footway of the adjoining street, and any cellar, where such room or cellar is or has been occupied separately as a dwelling, which does not comply with the requirements contained in the 103rd section of the said Act. Your committee recommend that a letter be sent to each District Surveyor by the Clerk, informing him thereof, and asking why returns have not been made to the Board as required by the Act, and requiring returns to be made in the present month of December, and in future in June and December of each year."

Mr. J. Ebenezer Saunders, chairman of the committee, in moving the adoption of the report, said it was most important, in the interest of public health, that the District Surveyors should do their duty with regard to this matter.

Mr. Edwards, as representing Marylebone, coincided. In his parish recent revelations had shown that in streets where one would have little expected to find them, underground dwellings existed.

The report was adopted.

We think it right to observe that the District Surveyors are not the proper body to carry out this requirement; their duties are structural,—not matters of police. Moreover, the Act does not give them power to enter at such times as would be necessary to prove occupancy.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,055. J. A. Davie, Ebbw-vale. Preparation and combination of materials for bricks, tiles, slabs, &c. Nov. 18, 1881.

5,064. E. Homan, Turnham-green. Construction of fire-proof floors. Nov. 19, 1881.

5,067. W. S. Welton, London. Appliances for economising fuel and consuming smoke. Nov. 19, 1881.

5,077. H. H. Banyard, London. Water-meters. (Com. by W. Germutz, Vienna.) Nov. 21, 1881.

5,091. H. Defty, Middlesbrough. Generating heat by gas or oils for heating buildings. Nov. 22, 1881.

5,095. W. R. Lake, London. Manufacture of bricks. (Com. by W. W. Potts, Bridgeport, U.S.A.) Nov. 22, 1881.

5,111. J. R. Hargreaves, Haslingden. Hot-water fittings in houses. Nov. 23, 1881.

5,118. H. J. Haddan, Kensington. Construction of roads and pavements. (Com. by J. J. Salvat, Morceux, France.) Nov. 23, 1881.

5,142. L. A. Groth, London. Apparatus for warming or heating. (Com. by C. Östlund, Stockholm.) Nov. 24, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

Nov. 22, 1881.

3,116. G. Furness and J. Robertshaw, Manchester. Appliances for raising, holding, or lowering blinds. July 18, 1881.

3,156. T. E. Parker, Battersea. Open fireplaces, &c. July 20, 1881.

3,183. W. Cunnington and W. Cunnington, jun., Chelsea. Decoration of paper-hangings, &c. July 21, 1881.

3,223. T. Barnby, Birmingham. Folding or camp furniture. July 23, 1881.

3,303. J. H. Johnson, London. Manufacture of artificial stone and marble, &c. (Com. by La Société Anonyme de Certado, Paris.) July 28, 1881.

3,746. E. Kaulbach, London. Apparatus for consuming coal, &c., for heating purposes. Aug. 27, 1881.

Nov. 25, 1881.

3,170. R. R. Gibbs, Liverpool. Apparatus for cooling, cleansing, and purifying air. July 21, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending November 26, 1881.

1,671. G. H. Flood & D. Young, London. Apparatus for regulating and controlling the flow of liquids.

This is an improvement on Patent No. 2,468 of 1880, in applying the wedge to valve-cocks and ball-valves. (*Pro. Pro.*) April 16, 1881. Price 2d.

1,680. A. Tyson, Ulverston. Hot-bed frames or conservatories.

The roof is cover-glazed and formed in two parts, jointed in the middle. The gable ends are hinged frames, to fold down out of the way when the top cover is let down flat, and to stand up when the cover is to form a slanting roof. These are all secured by hooks, &c. April 16, 1881. Price 4d.

1,682. L. Wall, Islington. Apparatus for regulating supply of water to water-closets.

This is an oscillating receiver, which is placed in the tank and filled through a ball-valve. The receiver is hopper-shaped, and when full it tilts over and discharges its contents, at the same time closing the ball-valve. When empty it returns to its place and is again filled. April 16, 1881. Price 6d.

1,714. C. R. Stevens, Lewisham. Apparatus for heating, cooking, &c.

For supplying hot water to baths, &c., a boiler is used with two flues, through which the heated gases from the burner beneath pass up and down before they escape to the flue-pipe. The heated water, therefore, ascends a flow-pipe into the tank above, from which it again descends through the return-pipe until it is all duly heated. This invention also includes a boiler for creating steam for blast purposes for cooking, &c.; a gas-regulator for the heating apparatus, and tanks for circulating water-heaters, the bottom and sides whereof are held together by channel-iron. April 20, 1881. Price 8d.

1,747. W. R. Lake, London. Castors for chairs, tables, &c.

These castors are rendered elastic or yielding by a spiral spring placed round the stem so that the table, &c., is always in a level position, even if the floor is uneven. (Com. by A. F. Maachain, Geneva.) (*Pro. Pro.*) April 22, 1881. Price 2d.

1,756. G. Walker, Birmingham. Fastenings for windows.

A spring catch-piece is applied to the upper bar of the lower sash, so that when the fastening arm on the lower bar of the upper sash is turned, it slips past the free end of the catch-piece and is thereby firmly locked. (*Pro. Pro.*) April 23, 1881. Price 2d.

1,757. A. M. Taylor, Lenzie. Safety-valve plugs for water heaters or boilers.

These are specially applicable to kitchen boilers. The plug is made with a passage through it and is screwed into a hole in the boiler shell. The passage is closed by a valve with an internal spindle, on the inner end of which a sprig is placed. April 23, 1881. Price 6d.

1,817. W. E. Gedge, Westminster. Artificial stone.

The stone is made of sand and lime or cement, set with a solution of shellac, glue, or borax, &c., and it has a facing of porcelain to prevent porosity. Wires are imbedded in the body of the stone, whereby the blocks may be bound together or to the beams in the building. Plates of metal, rubber, or felt, &c., are interposed between the stones to prevent access of moisture. (Com. by G. Boden, Atlantic City, U.S.A.) April 27, 1881. Price 6d.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

BUILDING STONES OF SCOTLAND.

Sir,—I have read in the *Builder* a paper read by Mr. Gowans, under the above heading, with great interest; and as he lays considerable stress on the Carmyllie Railway and the Auld Wind Mill, it behoves me to take a little wind out of this old wind-mill, and blow it a little more to the north-east. No doubt Messrs. Gowans and Mitchell did a great deal of good to the Carmyllie district in connexion with the Earl of Dalhousie, to whom the quarries belonged, and no doubt a greater trade by all the difference he has mentioned is carried on there now than was forty-five years ago, being the extent of my own memory; but the question is, have the machines or the railway contributed most to the development of the quarries? There was a time, a little beyond my memory, say just fifty years ago, when there was not a stone-planing machine in Forfarshire, but there was a gentleman, Mr. Fullarton Lindsey Carnegie, who engaged the son of a loom and shuttle maker to come from Arbroath to his estate at Leysmill to fit up and work circular saws for cutting up timber, and in this capacity he invented the Forfarshire stone-planing machine, and opened the far-famed Leysmill Quarries, and by the support of the said Mr. Carnegie assisted to carry out the Arbroath and Forfar railway, and had wagons and horses ready when the last rail was laid to carry on traffic betwixt Leysmill and Arbroath for months before the first locomotive (Victoria) was ready. And I may here mention that the first machine was made about the year 1833; and about that time, or a little after, the late Sir Wm. Cubitt, and many others, came from London to see them at work, and their report was so favourable that shortly after machines were sent to Valencia to plane the slate flags there, and to Lord Morley's estate near Plymouth, to Sweden and Belgium, also to Yorkshire; but in no case, except the slate, has there been found beds of flags that can be planed by these machines so well as those of Forfarshire, and before the opening of the railway to Arbroath there were six machines in operation, planing 1,000 ft. super. per day. And after this railway was started slabs were carted from Carmyllie four miles, and from the Forfar quarries ten miles, either to supply the great demand upon the Leysmill quarry-owner, or they were planed at the rate of 3*l.* 8*s.* 6*d.* per 1,000 ft.

But these were still early days, when the country was not prepared all at once to receive those improvements, any more than it was for the great feat of naval architecture of Brunel: so, under the superintendence of the inventor,—my late father, James Hunter,—the Leysmill Quarries went on in prosperity, while surrounding quarries were slack, owing to the want of machinery; and the first planing-machines erected in Carmyllie district were two, which had been sent to London to a Mr. Braithwaite to work, under licence, in a given circle with St. Paul's as its centre, but the agreement not being properly carried out, they were recovered, and erected at Carmyllie some seven or eight years before Mr. Gowans made the railway, and to this date these particular planing-machines have not been improved upon. But the inventor introduced a method of throwing over the tools at the end of each stroke, so as to preserve a cutting-edge when working on such as Yorkshire flags; and the same arrangement has since been introduced by Messrs. Coulter & Harpers. Next come the sawing and moulding machines referred to. These were entirely my invention, and they have been used broadcast all over Forfarshire, and although I have learned that a late Arbroath firm actually charged a royalty on these machines in my name to the extent of 50*l.* and 100*l.* each, yet I never received one penny out of the Forfarshire quarries, although I had four patents, all of which are being worked upon amongst those quarries.

And now, having stated a few facts as to what has taken place, I should like to look forward as to what may take place in another fifty years. There is a large deposit of very fine pavement under Turin Hill, and there is a railway station at its base, and this rock could be reached by a short tunnel from behind this station, cutting through to the back of the rock, which lies at a dip; a strong conglomerate lies over it, so that a reasonably-sized roof or chamber can be opened. But mining has not been attempted to win the flag-rock of Forfarshire, with or without the aid of machinery. But considering it has given birth to such mechanical men as James Carmichael, Dundee, inventor of the fan-blast; Mr. Bell, parish minister of Carmyllie, the reaping-machine; Alexander Shanks, Arbroath, the lawn-mower; James Hunter, Leysmill, the stone planing and boring machines, it would not be too much to expect that one will yet turn up to convert Turin Hill into a machine mole's nest, and Clocksbriggs into another Carmyllie.

Geo. Hunter.

The Wood Trade.—Messrs. James Smith & Co., of Liverpool, say, in their wood circular and prices current:—"The arrivals since our last have been 61 vessels, 49,225 tons, against 140 vessels, 103,867 tons in corresponding period last year; and 37 vessels, 15,193 tons in 1879. The demand for the month has been somewhat checked by the advance in prices of most articles, and the continued firmness of holders, who are strengthened considerably by the moderate stocks, small import, and the large number of casualties caused by the late gales. Trade generally throughout the country is better, but the prevailing complaint is that prices do not improve as quickly as was expected. If shipments are kept moderate, a fair business may be realised during the winter. Money continues firm, and the bank-rate is unchanged, ruling at five per cent. Freights continue favourable to importers."

THE INSTITUTE OF PAINTERS IN WATER-COLOURS.

The two principal Water-Colour Exhibitions held the private views of their Winter Collections on the same day, as usual (Saturday last), but we have only space this week for a notice of one of them. We made no secret, in speaking of the last of the Institute's exhibitions, that we looked on their position as critical. The Winter Exhibition, considered that it is frankly what these winter exhibitions originally professed to be in both cases, one of sketches and studies, is more encouraging again, and contains some good things: some also of the peculiar trick-painting which certain members practised *ad nauseam*, is much less frequent or prominent. The Institute has lost by death, since its last exhibition, a member whose drawings were always pretty prominent there, Mr. Augustus Bouvier, whose very French-looking nymphs, dancing or posing always with the same mannered and coquettish grace, may have had their admirers, who must now look their last on these damsels. We say polite things to ladies at parting, even when they have been dull, and we will endeavour to make no exception in regard to these *demoiselles* of the late Mr. Bouvier's creation who now simper before us for the last time. *Valete, puellæ!*

The times are gone when Mr. J. D. Linton sent his most thoughtful work to this gallery, where his genius became known to those who can appreciate superb colouring and execution, and a dignified and thoughtful style. His strength has been expended elsewhere of late, and his one contribution, as has been the case since then, is rather a study of a costumed figure than a picture, in the sense of those he used to send. It is called "The Earl of Leicester" (217), a three-quarter length figure in a hawking costume of buff, but decorated with richly jewelled appendages, holding a hawk on his wrist. The drawing might have any other name, but the refined and delicate features are of sufficiently *recherché* type to suit the idea of the Earl of Leicester, and it is finished with exquisite softness and delicacy. Mr. C. H. Staniland, in "H.R.H." (25), suggests the idea that he has been influenced by the style of Mr. Linton in some respects, mostly in regard to colour and the general scope of the picture; it may also be called a costumed figure, that of a little child dressed in rich and long robes in which warm amber predominates, and with a ponderous wig of dark hair placed on her head, from beneath which her own blond hair shows. The face is pretty and infantile, and there is a playful effectiveness about the whole. Mr. C. Green's "Cup and Ball" (212) and "Yours Devotedly" (289) can claim to have little more interest than what belongs to lay figures well posed and clothed in effective dresses which are well painted. Miss Mary L. Gow's "An Invitation" (179) belongs to a different order of work; there is much character in the figure of the girl who writes the letter, to whom an old bookcase with its motley contents forms a carefully-studied background. Mr. G. Clausen's "An Interior" (225) is a very clever slightly-executed study, both in regard to the figure and the surroundings. Mr. Towneley Green's "Autumn" (185), a figure in mourning seated in a landscape, has a very pleasing feeling, and that careful and refined drawing of the figure which distinguishes his work; "The Young Housekeeper" (301) shows similar qualities in a portrayal of a very different scene and subject.

Among the landscapes there are many pleasant bits. Mr. E. J. Gregory's "A Calm on the Medway" (13) is a bit of soft sunlight and colour recalling to us some of Cotman's effects. Mr. Whymper's "Passing Storm" (29) is fine in the cloud effect, but wants force in the foreground. Mr. Wimperis's "Low Tide" (53) is a fine little study in the school of David Cox, and Mr. Collier's larger sketch, "Stacking Peat" (195), is as free and powerful a thing, in the same fine school, as one could wish to see. In another manner two or three studies of Mr. Mark Fisher's, especially "Meadow Land" (115), are equally redolent of the breath of nature and of the qualities of the best water-colour art. Mr. Fullylove sends three works in three different styles, all equally good. There is the picturesque of English village buildings in "Cottages in Leicestershire" (54), and the picturesque of palace gardens in "An Italian Garden" (221), and that of grandiose internal architecture in "Siena Cathedral" (286); and it is gratifying to see that this able artist, though he found a new source of effect in painting trim gardens and their lofty hedges, is not going to make this a mere receipt for constant repetition.

Among various small things, two fruit pieces by Mr. John Sherrin, "A Bough of Gooseberries" (267) and "A Bough of Plums" (310), show careful study and no little brilliancy of colour and execution. Some works there are which ought not to be on the walls of any exhibition, and one or two large works with good names which we may conclude are not painted recently or for this exhibition.

AS TO BUILDING OPERATIONS DURING THE NIGHT.

WEBB *v.* BARKER AND WHITEHEAD.

This was an action before Vice Chancellor Hall, in the Court of Chancery, for an injunction to restrain defendants from causing a nuisance to plaintiff by the noise of building operations during the night.

Mr. Eddis, Q.C., and Mr. A. C. Eddis, appeared for the plaintiff, and Mr. Graham Hastings, Q.C., and Mr. Warmington for the defendants.

The defendants are drapers, carrying on business at 75 to 93, High-street, Kensington, and the plaintiff is a provision merchant carrying on business on the property adjoining at 73, High-street, the upper part of his house being occupied for dwelling purposes.

The evidence was to the effect that the defendants were making certain alterations to their premises, and that the builder's workmen employed by them not only worked all day, but during the night, causing such an intolerable noise that persons residing in the house of the plaintiff were unable to sleep.

Defendants' counsel submitted that it was not the practice of the Court to grant an injunction to restrain a mere temporary nuisance. Plans prepared by Mr. Josiah Houle, the defendants' architect, were produced in Court showing the nature of the works, and numerous affidavits of a conflicting character on both sides were read, and after a lengthened inquiry the following decision was given by the Vice-Chancellor.

"The first question is as to the jurisdiction of the Court to grant such an Injunction as that granted in this case. I think that there is jurisdiction to do so under the circumstances existing. It has been said the Court must look at the matter in a reasonable point of view. I do look at it, I hope, in a reasonable point of view, and so looking at it I find that this alleged complaint which I consider to be a nuisance, is doing that which interferes with the comfortable, reasonable, and ordinary enjoyment of the plaintiff's property, and it is unreasonable for the defendants to so act. That interference, and that unreasonable interference being, doing the work during the night time, I do not consider that the plaintiff having this property, consisting in part of a dwelling-house, is bound to submit to the defendants carrying on the works in question during the time ordinarily devoted to sleeping, that is, during the night. It is for that reason the injunction was limited to the hours specified, that is, between eight o'clock p.m. and six o'clock a.m. It is said that this work is only temporary, and for a short time. As regards that I am not satisfied at all, and it does not appear how long this work is going to be continued. I hold that such an interference with the plaintiff's comfort at night times is that of which the plaintiff has a right to complain, and would have a right to complain if this case were now being heard upon the hearing of the action, and that the intermediate injury between the application and the hearing is shown to be of such a character that there ought to be the intermediate relief by an interlocutory injunction.

The next question is, whether, in point of fact, the case is made out? As to that, I think the evidence is plain that there was an interference with the plaintiff's comfortable enjoyment of his dwelling. I may say that I think the evidence of Mr. Goddard, the evidence of the governess, and the evidence of the servants, are amply sufficient to satisfy me that there has been an interference. That being so, I consider the interim order was right. It only remains to deal with the motion for committal. As to that, it is really attempted to get rid of the effect of that motion by saying "We have done nothing wrong." True it is there may have been a noise, as to which you may perhaps say "There is no evidence establishing the noise after the date of the injunction." I am satisfied upon the evidence that on the 18th there was a making of noise such as was intended to be enjoined in High-street, because I consider that the work at the place it was done being and among other things the putting up of an iron door between two portions of the entire building, after it was reconstructed, was, within the meaning of the injunction, making a noise, which was interdicted in the defendant's premises in Kensington, within the meaning of the order, and therefore the defendants must pay the costs of that motion to commit."

A New Exhibition.—The Sportsman's Exhibition is to be opened at the Agricultural Hall, London, on February 9th, and is to comprise every requisite in connexion with Coaching and Driving, Hunting and Riding, Shooting, Yachting, Fishing, Fencing, Athletics, Bicycling, Archery, and games and amusements of all kinds. The idea is a good one.

LONDON ARCHITECTS WITH PROVINCIAL WORK.

Sir,—London architects who have work in the provinces are very hard upon us poor local builders in either not giving quantities, or giving them prepared by a London, and (to us) a perfectly unknown, quantity surveyor, while it is notorious that quantities by a local surveyor are always understood better, and we have more confidence in them, which saves cost to the clients. I will give an example to illustrate what I mean.

The Government recently advertised for tenders for building a post-office in Yorkshire, but no quantities were supplied, and I employed a local quantity surveyor to measure up the work. I did not get the job, yet I had to pay him, although he admits that he has got the quantities out for four contractors (including myself), and that one of his clients is the successful contractor, and he has added 2 per cent. on the amount of the contract to pay the surveyor, who must have made 5 or 6 per cent. on the cost of the job. It would have been nearly as bad if a London surveyor had been engaged, as we should have to get a local surveyor to explain the architectural terms they employ into our local phraseology.

I particularly object to London quantities when the work is erected by subscription. I was recently solicited to subscribe towards building a chancel to our church, but I found that a London architect was employed, and that the quantities would be prepared by a London surveyor, and that if I tendered I should have to pay at least 1*l.* 1*s.* to a local surveyor to interpret the items in the quantities. I, therefore, refused to subscribe; and shall not tender for that or any other work unless quantities that we can understand are supplied, or unless an allowance is made for tenders.

I inclose my card, but wish to remain,

A Successful Builder.

CLERKS OF WORKS.

Sir,—The suggestion thrown out by one who signs himself a "Clerk of Works," for the formation of a society to be called "The Clerks of Works and Builders' Foremen's Association," will meet with approval and support by a large body of men; but if this age is one of progress, as your correspondent assures us, then we may hope the day will not be far off when architects will select their clerks of works from the rank of properly trained and qualified men, who are able to carry out their works in the spirit in which they are designed, and in every other respect fit to be their deputies and members of their profession, as they are in France, Germany, Austria, and other countries. Architects who have travelled abroad and visited buildings in progress, such as the cathedrals at Cologne, Mainz, St. Stephen's at Vienna, the law-courts there, the opera-houses at Dresden, Paris, &c., and met the clerks of works there, must be aware of the difference. It is only surprising that affairs have been allowed to remain unchallenged, all the more as architects have been only too anxious to raise the standard of their profession by proper training, examinations' diplomas, and other devices.

An Old Clerk of Works.

LEAD POISONING.

Sir,—In your notice of Mr. Belgrand's pamphlet, laid by Dr. Saunders before the London Commissioners of Sewers, you very properly call attention to the evidence in England of evil results caused by drinking water, of a certain composition, which had passed through leaden pipes. I believe that in Berlin lead is the only metal that will withstand the destructive force of the water, whilst iron is corroded and eaten through in the course of two or three years. But what I wished chiefly to call attention to is the fact, as I believe it to be, that whilst the greatest danger may arise from the decomposition of lead in stagnant service-pipes and stagnant cisterns, according to the nature of the water and the duration of its period of change and flow, there is not the slightest danger of any sort to be feared from the flow of water through any number of miles of leaden pipes so that it be always flowing.

William White, F.S.A.

THE CASTLE HILL, GAINSBOROUGH.

Sir,—I observe in the *Builder* (p. 662) a note upon "the Castle Hill, Gainsborough." The property belongs to Sir Hickman B. Bacon, premier baronet. He is wintering in Madeira, and will probably not see your number of the 26th ult.; but I can say, on his behalf, that nothing would give him greater satisfaction than that a careful survey and examination of the earthworks should be made. The earthworks, being partly within the park, cannot be open to every passer-by; but Sir Hickman would certainly be the first to come forward and meet any proposal that might be made for an examination and survey. Somers Clarke, Jun.

COMPETITION FOR BOARD-SCHOOLS FOR BARROW-IN-FURNESS AND ROOSE.

Sir,—The letter in your issue of the 19th of November, signed A.B., having reference to the above competition, is calculated to mislead.

The Board did decide in favour of Mr. Holtom for the Island-road Schools. They afterwards invited Mr. Holtom, of Dewsbury, Messrs. T. & W. Bennett, of Manchester, and Mr. Cox, of Kendal, to submit designs in limited competition for Roose.

In consequence of Mr. Cox's designs not complying with the instructions, the competition lay between Mr. Holtom and Messrs. Bennett, each obtaining an equal number of votes. The chairman would not give the casting-vote (having already done so on a former occasion against Mr. Bennett); eventually it was decided to refer the matter to Sir James Ramsden, whose award was in favour of Mr. Holtom. C. D.

DISCOLOURED WATER.

Sir,—Will any of your readers tell me why my supply of water should be discoloured by rust or some similar substance? The water is obtained from a pond about half a mile away, where it is quite limpid; it first runs through a rough filter, composed of gravel and charcoal, into a small reservoir, and is thence carried in iron pipes to my residence; it is usually unfit for washing or cooking purposes unless filtered. I believe that the water supply to towns is carried in iron pipes, and I have not heard of the same complaint.

Any explanation or cure that may be suggested will be thankfully received by

A Lover of Clean Water.

TESTING TRAPS.

Sir,—Whilst on the one hand I have not the least desire to be either severe upon, or offensive to, your correspondent, Mr. Eastgate, I am compelled to respond to his letter in somewhat positive terms, and I think that perhaps the most simple and decisive way that I can do it is to ask him a series of questions, tending to assist his memory and at the same time show him where he is in error. I will proceed in this wise:—

Did he ever go to Messrs. Pullen & Son's and, after examining the scaffold, fitting of the traps, &c., in reply to a question from Mr. Pullen, express himself to the effect that all was fair and just? If he has forgotten this circumstance, I have not, as I was present and heard the conversation.

Did he, after this, rush into print and assert quite the contrary, viz.,—that there was "a space of 18 in. between the plug in the basin and the water-line in the trap"?

Does he remember that, after this, on the 19th of November, I met him at Messrs. Pullen & Son's and distinctly showed him that it momentumed out at 6-in. drop, and that he measured the distance with his 2-foot rule, and acknowledged his error?

Does he remember that he wrote to a contemporary and acknowledged he had made a mistake; but even then (in spite of its having been proved before his eyes and in accordance with his own measurement to be only 6 in.) asserting it was 14 in., thereby virtually stealing 8 in.?

Does he know that Mr. Buchan has also measured this same, and attested to its being only 6 in. instead of 18 in., when it momentumed out?

Does he remember that he wrote, saying:—"Beneath a valve-closet was the safest place to fix a round U trap, and that it will there hold its seal secure"? Your practical readers will, of course, know that the shortest distance between a valve-closet valve and the water-line in a U or half O-trap, is 10 in., so that I am giving him an advantage of at least 4 in. in my tests. Does he know that Mr. Hellyer has written these words:—"The reason why Beard & Dent's U or half O-trap is unsuited for fixing under a valve-closet is, that the contents are easily knocked out; it is safe enough to use under the 'Artisan' and wash-out kind of water-closets. The 4-in. patent cast-trap is faulty in form, for its rise to its outlet is much too easy"? By this last it will be plain to everybody that the manufacturer of this trap agrees with me that it is faulty, and yet Mr. E. will persist in contradiction.

Again, your correspondent attacks me on the point of ventilation. I would ask him if he can ever remember my having depreciated its advantages, and does he not know that I have always advocated ventilation as something imperative in sanitation? *De facto*, I consider good ventilation and good trapping the only true key-notes to effectual sanitation.

Mr. E. boldly asserts that "the O trap proper has not been introduced at all into these experiments. I understood Mr Davies to say that he had not tested it." Now, I will beg his memory. I most distinctly told Mr. E., in the presence of three other persons, that I had tried the real O-trap, and that it was one of Doulton & Bois's patent make, when he replied he always made his pattern trap from one of the same.

In reply to his assertion as to the want of fairness, has not Mr. Buchan, writing to the press, used these words:—"In regard to the mode of conducting the experiments, I consider such fair enough for the purpose,—it is, in fact, more useful than trying them with the water running into the basin all the time the basin is being emptied, for although generally the case, in practice it does not always happen"? In this I must agree with Mr. Buchan.

This is not the first time that Mr. Eastgate has challenged the truth of my articles and reports, but as this challenge is put in definite form, I must tell that gentleman that when he is prepared to produce either certificates or indentures (as I am) that he is a civil engineer and plumber (or I will be liberal and let him off with one), I shall be prepared to respond to his challenge, and not till then, any more than would a physician meet a chemist in consultation as a physician.

P. J. Davies, Hon. Mem. A.S.P.

VARIORUM.

A third edition has been published of the "Description of the Chemical Laboratories at the Owens College, Manchester," by Mr. H. E. Roscoe, F.R.S., from the plans of Mr. Waterhouse, A.R.A. (Cornish, Manchester). It includes details of the fittings.——The "Lectures on Architecture," delivered at the Royal Academy by the late E. M. Barry, R.A., have been published by Mr. Murray, and will have attention at our hands in due course.——We may say the same as to a beautiful book, "Raphael, his Life, Works, and Times," just now issued by Chapman & Hall. This is from the French of Eugène Muntz, and is edited by Mr. Walter Armstrong.——Part 7 of "English Etchings" (Reeves, Fleet-street), includes an effective view in the old Cock Tavern, Fleet-street, and two landscapes. The subjects are well printed on good paper, and will hereafter make a nice book.——Speaking of the newly-built quarter of Ismaileeyah, Cairo, "Egypt, Descriptive and Picturesque," says,—"It has throughout a European aspect, and sprang into life with astonishing rapidity, for the Viceroy gave the building land for nothing to every one who pledged himself to build within a year and a half a house worth at least 1,200*l*. In order to plan wide thoroughfares, the example set by Baron Haussmann in Paris was only too closely followed. Whole quarters of the city were demolished to make way for new ones, handsomer, in the modern European style. The lamentation of the lovers of antiquity over this impious proceeding are only too well justified; but certainly the city has gained in healthiness and pleasantness as much as it lost in venerable and picturesque character, particularly by the construction of very good new aqueducts in the place of the old ones, which were insufficient, by the opening of new canals, and by the abundant planting of umbrageous trees. The most complete transformation was in the Ezbekeeyeh-square. Stately buildings,—some really magnificent,—and among them a theatre, the largest hotels, several Consulates, and the Cairo Bourse, handsome private houses and splendid shops, surround it on every side, and the public garden in the middle is one of the loveliest in the world. One that has more quickly sprung into life and perfection certainly nowhere exists. In the quiet early morning hours the visitor may enjoy a solitary walk under the broad shade of its spreading trees; charmed with the beauty of the shrubs that border the well-kept paths, the growth of every zone; in the afternoon he mixes here with the crowd, listening to the finest compositions of European musicians performed by the Egyptian band,—not forgetting to admire the vegetation that surrounds him, to look into the artificial grottos, and to walk round the large basin in the middle of the garden; and he will find it difficult to believe the fact, when he is assured that this park, now fully grown, was not planned till 1870, by Barilet, the chief gardener of the city of Paris, now lately dead. It is unnecessary to say that such a city as Cairo now is is lighted with gas, and no one who has seen the Ezbekeeyeh lighted up with its 2,500 jets in their coloured tulip-shaped glasses can ever forget that wonderful scene."——From the *Leisure Hour* we obtain the following interesting sketch of "Student Life at Athens":—"Modern Athens is strong in students. Not only do many youths pass through the lower schools and gymnasium up to the University, but the University, being the centre of learning, not for Athens only, but for all the Greek race whether still under Turkish rule or no, and offering an education nearly free to all, attracts to it ambitious young men from Thessaly, Epirus, the Ægean Islands, and Constantinople itself. Hither they come penniless, but athirst after knowledge, take menial situations,—every family has its man-servant, for it is not the custom of the poorest girl to go about alone,—and thus they earn board, lodging, and clothing while they pursue their studies and attend the university lectures. Education, indeed, is a drug in Modern Athens; there is a plethora of educated men. A story is told of a traveller who asked a member of the Government, to whom he had brought a letter of introduction, where he could find a trustworthy Greek attendant to wait upon him and act as guide and interpreter. To his astonishment the minister replied, 'Why not employ my brother? He is just what you need. He is a graduate of the university, speaks several languages, is a civil and obliging fellow, and is anxious for a situation.' There are hosts of graduates looking out for Government appointments, and ready meantime to turn a penny by any employment, however humble. The high esteem in which education is held, the large proportion of public funds devoted to it, and the eagerness with which it is sought and acquired, are among the most striking features of New Greece. The people manifest a natural and instinctive love of learning for its own sake, and apart from its commercial value. The learned professions are accessible to all, and they are overstocked. Literary men abound, and find employment as newspaper writers and *soi-disant* politicians. A practical Englishman would call many of these men 'spoiled artisans.' And, indeed, it is a matter of regret that practical science is not more generally encouraged. But the Greeks have few mechanical tendencies; they are thinkers rather than workers; the brain is their implement rather than the hand. It is to be hoped that the enlargement of their territory, demanding new roads, new bridges, new railways, new harbours, and public works, will stimulate the pursuit of engineering and other mechanical arts."——*The Bibliographer*, a journal devoted to book-lore, is the title of a new monthly serial (Elliot Stock) which promises to supply a want. It will include articles on the public and private libraries of the world, lives of celebrated collectors, a retrospective review of rare, curious, and important books, reminiscences of bibliographers, booksellers, and printers, papers on American bibliography, the history of catalogues and of libraries, marginalia of eminent men, keys to the characters in certain famous books, and many other subjects. The first number is well got up.——The ninth edition of "The Railway and Commercial Gazetteer of England, Scotland, and Wales," now before us, contains a complete list, arranged in alphabetical order, of every town, village, parish, and place in Great Britain,—over 36,000,—and indicates directly the distance from London to each, including the most obscure hamlet, showing also the post offices, money-order offices, telegraph offices, wherever they exist, in addition to the line of railway and nearest station.

Miscellanea.

Fulham Infirmary.—At last week's meeting the Board considered the question of selecting plans for the new infirmary. Mr. Storey proposed that the authors of five other plans other than those recommended by Mr. Carrey, the architect appointed for that purpose, be called before the Board to explain their plans. This was seconded. Mr. Froy moved as an amendment that no other envelopes containing designs for the new infirmary be opened, nor the names of the authors be made known until the Board had decided what plan they should select. This was also seconded, but on being put to the vote was negatived, and Mr. Storey's motion was put and lost. Mr. Froy proposed that the plan recommended by Mr. Carroy be adopted, which was seconded. Mr. Rogers proposed the acceptance of a plan the cost of construction from which would be 26,000*l*. After discussion, Mr. Froy's motion was carried. The cost of the building, according to a selected plan, would be about 40,000*l*.

The American Institute of Architects.—The fifteenth annual session of the American Institute of Architects began in Washington on the 16th of November, about fifty members in attendance. The session was mainly devoted to listening to an address entitled "Washington and the Capitol at the Beginning of the Present Century," delivered by Mr. John H. B. Latrobe, of Baltimore, whose father built the Capitol. The address was listened to with the deepest attention.

Ely Palace Chapel.—Another mural painting has just been added to the walls of this chapel in further illustration of English Church History. The subject (treated in oils) is the Martyrdom of St. Alban. The artists, as before, are Messrs. Powell Bros., Park-square, Leeds.

"An Eight Thousand Pound Blunder." In reference to the paragraph quoted by us last week from the *City Press*, it is right to say that at the last meeting of the Court of Common Council, the City Architect, Mr. Horace Jones, in reply to a member of the Court, said, with regard to professional intercourse between the Sewers Office and his own office he could only say that he had no trouble, and was always received by the Engineer with the greatest courtesy and politeness. He did not often go up the stairs himself, but his clerk was always answered with civility, and sometimes the Engineer paid him the honour of a personal visit, and gave him such information and assistance as he might require at his hands. Some twelve or eighteen months ago the Court directed a street to be made from Leadenhall-street to the market. It was necessary for the drainage of the market to put in a sewer, and he understood from inquiry at the Sewers Office that the sewer at that point was only some 14 ft. or 15 ft. deep, but that it was under consideration whether the sewer should be taken eastward up to St. Mary-axe. He had no hesitation whatever in putting himself in communication with the Engineer, who suggested that he should make an application to the Commission to adopt an 18 ft. sewer, and that was afterwards executed. During their conversation he asked if anything was likely to be done with regard to Leadenhall-street, between the new street and the corner of Gracechurch-street. Unofficially it was clearly imported into his mind that there was no likelihood of that, because it was the wrong side of the way. He had had a large plan made, and any one looking at it would see if he drew a straight line from the corner of Cornhill to the corner of the street eastward of the new street up to the market, that the land belonging to the Corporation was in a hollow south of that, whereas if the parallel line were to be carried out on the north side, it would show a very large lump on the north side, and he could never have thought they would suggest the south side instead of the north.

The Brighton Health Congress and Exhibition.—The Exhibition will be opened on Monday afternoon by the Earl of Chichester. The Congress, over which Dr. Richardson, F.R.S., presides, will be opened on Tuesday evening by the delivery of his inaugural address. The sittings of the Congress will be continued every day till Friday. The Congress will be composed of three sections. The first, presided over by Mr. Edwin Chadwick, C.B., relates to the Health of Towns; the second, presided over by Mr. J. R. Hollond, M.A., M.P., relates to Food; and the third, presided over by Dr. Alfred Carpenter, relates to Domestic Health. There will be introductory presidential addresses in each section.

Scaffold Accident: Caution.—An accident occurred at the Phœnix Foundry, Dunfermline, in this way. Six men were standing on a tempory scaffold, 18 ft. high, erected for the purpose of taking down a brick wall which was damaged by the late storm. The bricks were placed on the scaffold as they were removed, and the result was that owing to their weight a cross support broke and the entire structure came down with a terrific crash. All the men were dreadfully injured.

The O'Connell Memorial.—The national memorial statue to Daniel O'Connell, which has been in hand for many years, is now completed, and the colossal bronze casting will leave the foundry of Messrs. Drew & Co., Thames Ditton, shortly for erection in Sackville-street, Dublin. The cost of the memorial is 12,500*l*. The design was by the late J. H. Foley, R.A., and the work has been executed by Mr. Thomas Brock. The memorial will stand at a height of 45 ft. from the roadway.

A New Clock has just been erected in the town-hall at Bilston, Staffordshire. It shows the time upon three dials, each 5 ft. 6 in. across, which are of a new construction; all the figures are burnt upon white opal glass, and the gas by which they are illuminated is turned up and down automatically. All the wheels are of gun-metal, with their teeth machine-cut. The work has been executed by Messrs. Smith, Midland Clock Works, Derby.

Martin's White Lead Company.—This company, as noticed in our advertising columns, has been formed to carry on the manufacture of white-lead. It is claimed that the process, said to be perfected after many experiments, renders the material innocuous, both in its manufacture and use.

Sanitary Institute of Great Britain.—The opening meeting for session 1881-82 was held on Wednesday evening, when the inaugural address was delivered by Dr. Alfred Carpenter. Mr. E. White Wallis, the secretary, read the report of the adjudicators, Dr. B. W. Richardson and Dr. Farr, upon the essays sent in in competition for the Wyatt-Edgell Prize of 200*l*. The subject of the essays was "The range of hereditary tendencies of health and disease," and the successful competitor was declared to be Mr. George Gaskoin, of 7, Westbourne-park. In his address, Dr. Carpenter, in answer to opposition from other existing bodies, argued that there was no antagonism between the Institute and the bodies in question. It had been said that the Institute was antagonistic to the Social Science Association, but he contended that it was the legal offspring of that Association, being the natural result of the teachings of social science. He denied that there was any reason for the antagonism of some members of the Institute of British Architects, and also of some of the surveyors and engineers, pointing out that the Institute in no way proposed to educate and examine men so as to fit them for any of those professions. He urged that there was an important reason why the Institute should be recognised and even supported by the bodies referred to, as neither of them would trouble itself to provide an education, and a test of its appropriation, to the local surveyors in small districts and the sanitary inspectors of the whole of the kingdom.

A Reredos has recently been completed for Frisby Church, near Leicester, by Messrs. Jones & Willis, of Birmingham and London. The reredos proper is of alabaster, and has three panels, the centre one with the figure of our Lord in Glory; the outer panels have carved cusped trefoils, with red marble columns to support caps. The side-wings are of hand-painted tiles.

American Courtesy.—By the last mail it has been notified to Mr. Harry Hems, the sculptor, that he has been elected an Associate of the Society of the Sons of St. George at Philadelphia. This society was founded in A.D. 1771, and is therefore one of the oldest as well as one of the most honourable, in America. Mr. Hems, it may be remembered, was awarded a medal at the Centennial Exhibition of 1876.

The Royal Windsor Tapestry Works.—In connexion with the Royal Windsor Tapestry Works, a central hall and twelve cottages, intended as residences for the *employés*, are about to be erected at a cost of 6,000*l*. on the Crown lands opposite the factory at Old Windsor.

The Export of Deals from Montreal to the United Kingdom during the season of 1881 just closed stood at 38 cargoes, containing 21,838,287 ft. against 19,781,885 ft. in 1880, showing an increase of 2,056,402 ft. when the one year is compared with the other.

The Worshipful Company of Carpenters, at a recent meeting of the court, voted the sum of 1,000*l*. towards the building fund of the City and Guilds of London Institute for the Advancement of Technical Education.

A New Deaf and Dumb Institute, in connexion with the Smyllum Orphanage, Lanark, will shortly be commenced. It has been designed by Messrs. Pugin & Pugin, of Westminster.

Leadenhall Market.—The new Leadenhall-market is, it appears, to be opened on the 15th of December.

TENDERS

For the erection of new premises for the Birkbeck Scientific and Literary Institution, Chancery-lane. Messrs. Fowler & Hill, architects. Quantities supplied:—

	Portland.	Bath.
W. Bangs & Co.	£19,749	£18,709
Higgs & Hill	19,180	18,940
D. Rock	19,476	18,488
W. J. Beale	19,237	18,537
G. H. & A. Bywater	18,974	18,003
Kirk & Randal	18,571	17,620
J. Taylor	18,497	17,517
Pack Bros.	16,250	17,220
J. Bull & Sons	18,220	17,500
J. Mowlem & Co.	17,960	17,282
W. & D. McGregor	17,905	17,263
W. Crockett	17,778	17,400
E. Vaughan	17,739	16,878
Perry & Co.	17,607	16,817
M. Manley	17,603	17,226
J. T. Chappell	17,165	16,590
B. E. Nightingale*	17,045	16,161

* Accepted.

For infants' school, &c., in the rear of Mission Hall, St. Anne's-road, Stamford hill. Mr. Wm. Jesse F. Scott, architect:—

Shurmur (accepted).

For two new warehouses, Lilypot-lane, City. Mr. W. Wimble, architect:—

Hoare	£3,475	0	0
Hall, Bedall, & Co.	3,114	0	0
Ramsay	3,080	0	0
Brass	2,983	0	0
McLachlan & Sons	2,979	0	0
Faulkner	2,975	0	0
Ashby & Horner	2,945	0	0
Morter	2,873	0	0
Croaker	2,820	0	0

For repairs, &c., to No. 39, Welbeck-street. Messrs. Sandall & Corderoy, architects:—

Williams & Son	£577	0	0
McLachlan & Sons	522	0	0
Burningham	425	0	0
Higgs	392	0	0

For further alterations and additions at Lyndhurst-road Hotel, Hants, for Messrs. Hine Bros. Mr. W. H. Mitchell, architect:—

Stevens & Sons	£1,044	0	0
J. Dyer	958	0	0
Brinton & Born	885	0	0
J. W. Rowland	833	0	0
J. Crook (accepted)	797	0	0

For laying tennis-court and skating-rink with Limmer asphalte, Woolston, Southampton, for Mr. W. Garton:—Bradshaw & Co., Queen Victoria-street (accepted).

For the erection of a large newspaper kiosque in Broad-street, Leek, for Mr. Sam. Rider. Messrs. Sugden & Son, architects:—

For the whole.

Bromage	£135	0	0

Brickwork, &c.

Grave	99	0	0
Hall	75	0	0
Knowles (accepted)	66	0	0

Woodwork.

J. Hudson	95	10	0
Tomkinson	63	0	0
Bisley & Morris	61	15	0
Hall	60	0	0
Mackrell	59	10	0
James Hudson	55	0	0
Tatton	50	5	0
H. Carding (accepted)	38	10	0

Plumbing, &c.

W. Carding	23	0	0
Stevenson	20	11	0
T. Johnson (accepted)	19	5	6

For works in New-road, Stoke-next-Guildford, for Mr. John Cable. Messrs. Peak, Lunn, & Peak, architects. Quantities supplied:—

	Pair of Houses.	Stable.
Thos. Swayne, Guildford	£1,750 0	£335 10
Wm. Swayne, Guildford	1,664 10	200 10
Pearce & Clark, Guildford	1,535 0	195 0
Garnett & Mills, Guildford	1,530 0	190 18
Martin, Wells, & Co., Aldershot	1,471 6	193 10
Strudwick, Guildford	1,448 10	199 10
Mitchell Bros., Shalford	1,425 0	185 0
Pink, Milford	1,390 0	171 0
Smith & Sons,* Guildford	1,301 0	178 6

* Accepted.

For new class-room at the Board School, Alfold, Surrey. Messrs. Peak, Lunn, & Peak, architects:—

Foreman, Cranleigh	£270	0	0
Ayling, Wisborough Green	213	0	0
Stevens, Plaistow	164	0	0
Underwood, Dunsfold	154	0	0
Spooner, Alfold Bars (accepted)	148	0	0

For new conservatory, Great Eaton, Witley, for Mr. F. E. Eastwood. Messrs. Peak, Lunn, & Peak, architects:—

Martin, Wells, & Co.,* Aldershot	£312	4	6

* Accepted.

For hot-water service at house, stable, and greenhouses, Witley, for Mr. F. E. Eastwood. Messrs. Peak, Lunn, & Peak, architects:—

Rosser & Russell, Charing-cross, in conjunction with Martin, Wells, & Co., Aldershot (accepted)	£433	11	6

For new stabling, "Woodcote," Ashley Park, Walton-on-Thames. Messrs. Peak, Lunn, & Peak, architects. Quantities supplied:—

Martin, Wells, & Co., Aldershot	£396	0	0
Faulkner,* Walton-on-Thames	349	0	0

* Accepted.

For the erection of a villa residence at Robin Hood-lane, Sutton, for Mr. S. R. Nye. Mr. J. Keal, architect:—

J. B. Potter	£580	0	0
H. Keal	540	0	0
J. Arney (accepted)	523	0	0
H. Winter	510	0	0

For alterations to the Green Man, Leytonstone, for Mr. A. S. Anglise. Mr. J. G. Needham, architect:—

Jackson & Todd	£515	0	0
Walker	475	0	0
Skipper	475	0	0
Marr	449	0	0
Hawkings (accepted)	433	0	0

For building new baths in the rear of 574, Mile-end-road, for Mr. Bluemell. Mr. C. Legg, architect. Quantities by Mr. W. Hawker:—

Parish	£625	0	0
Hawkings	579	0	0
Judd	487	0	0

For the erection of a pair of villa residences, South Park, Wimbledon. Mr. Fred. C. Notley, architect:—E. & E. Smith, Balham (accepted)... £1,375 0 0

For new works for the Bedford Ironworks Company. Messrs. Usher & Anthony, architects. Quantities supplied :—

Higgs & Hill, London	£8,980	0	0
S. & W. Pattinson, Sleaford	6,978	0	0
Wood & Son, Leicester	6,624	0	0
Warton & Walker, Bedford	6,392	0	0
Harrison, Bedford	6,370	0	0
Adams, Bedford	6,261	0	0
Potter, Bedford	6,100	0	0
Claridge, Banbury	6,050	0	0
Edey & Wade, St. Neot's	6,000	0	0
S. Foster, Kempston (accepted)	5,987	0	0

For boundary-walls, fences, gates, and the laying out of a new cemetery, at Potton, Beds., for the Potton Burial Board. Messrs. Usher & Anthony, architects :—

Edey & Wade, St. Neot's	£462	17	0
S. Foster, Kempston	331	0	0
Bartle, Potton	289	10	0
Woodman, Potton	266	0	0
Burnage, Potton (accepted)	283	5	0

For vagrant wards, Market Rasen. Messrs. Bellamy & Hardy, architect :—

Chris. Wallis, Caistor	£1,552	4	3
Nightingale & Danby, Grimsby	1,480	17	7
Walter & Heusman, Horncastle	1,423	0	0
Jolland Chapman, Grimsby	1,421	4	0
G. Dent, Brigg	1,370	0	0
T. Wilson, E. Markham	1,369	0	0
C. Sanderson, Market Rasen	1,266	0	0
Malam & Freeman, Market Rasen	1,254	13	1
T. H. W. & H. Wallis, Spalding	1,239	0	0
C. Kendal, Market Rasen	1,236	15	0
J. Harrison, Market Rasen	1,210	0	0
Chas. Brownlow,* Market Rasen	1,209	11	0

* Accepted.

For new hall and offices in the Southwark Bridge-road, for the Bricklayers' Society. Messrs. A. & C. Harston, architects :—

Brass	£5,110	0	0
Wall Bros.	5,050	0	0
Goodman	4,480	0	0
Hall, Beddall, & Co.	4,445	0	0
Kilby	4,400	0	0
Shurmur	4,085	0	0
Crockett	3,840	0	0

For alterations and additions at the King's Head public-house, Buckingham Palace-road, for Messrs. Watney & Co. Mr. C. W. Bovis, architect. Quantities supplied :—

Clarke & Bracey	£1,225	0	0
Hockley	1,218	0	0
Wilks Bros.	1,183	0	0
Anley	1,180	0	0
Axford	1,175	0	0
Spencer & Co.	1,115	0	0
Finnegar	888	0	0

For alterations and additions to the Duke of Clarence public-house, Rotherfield-street, Essex-road. Mr. George W. Fisher, architect :—

S. Row	£306	0	0
J. Clinch	298	0	0
Dearing & Son	285	0	0
Styles	269	0	0

For draining and making up roads at Strode-street, Denham-road, and Hummer-lane, Egham. Mr. P. J. Byrne, surveyor :—

Squelch*	£303	10	0
Baigent	259	16	0
A. L. Oadest (drains only)	112	0	0

* Accepted for roads. † Accepted.

For four shops, Windsor, for Mr. G. H. Long, J.P. :—

J. Norris	£792	0	0
W. Willis	718	0	0
W. Woodbridge	680	0	0
H. Gray	630	0	0
McQuhae	627	0	0
F. Akery	605	0	0
W. P. Reavell (accepted)	592	0	0

For alteration and additions to the Jolly Farmers, Staines, for Mr. J. F. Harris. Messrs. Low & Birch, architects :—

J. Higgs, London (accepted).

For alterations and extension of premises, The Grange, Bermondsey, for Messrs. Samuel Barrow & Brother. Messrs. Elkington & Son, architects. Quantities by the Architects :—

Buller	£475	0	0
Wells	383	0	0
Eldridge & Gee (accepted)	348	0	0

For alteration and addition to No. 64, Aldermanbury, for Mr. G. L. Turney. Mr. A. Peebles, architect :—

Colls & Sons	£1,340	0	0
J. & J. Greenwood	1,275	0	0
Downs & Co.	1,175	0	0
C. Goad	1,153	0	0
Bird	1,011	5	5

For alterations and additions to No. 10, Lower Seymour-street, W., for Mr. Batt. Mr. Sancton Wood, architect :—

F. Sanden, New-street	£1,355	0	0
Stimpson & Co., Brompton	1,310	0	0
J. Higgs, Upper Park-place, N.W.	1,195	0	0

For alterations and additions to the Sarata Oil Works, Rotherhithe New-road, for Mr. Sterry. Mr. E. Saunders, architect :—

J. Higgs (accepted).

For further works in the erection of stores, cellars, &c., for Messrs. Wright Bros., at their new brewery, Leeds. Messrs. Davison, Inskipp, & Mackenzie, architects :—

Boothman & Son	£915	0	0
Irwin & Co. (accepted)	855	0	0

For alterations to entrance gates and raising boundary-wall at Homerton Hospital, for the Managers of the Metropolitan Asylums District Board. Mr. John Walker, architect :—

Shurmur (accepted).

TO CORRESPONDENTS.

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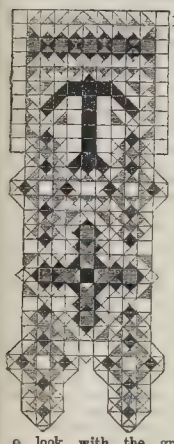
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Further Cogitations at the Smoke Abatement Exhibition.



THE primary distinction between apparatus for the use of smokeless fuel, and apparatus for the improved combustion of flaming coal, not having been adopted for the classification of the exhibits at South Kensington, or, indeed, for that matter, by the exhibitors themselves, the inquirer has to range over the whole length of the galleries twice, or with a double purpose. The distinction, however, is one of which the importance becomes more obvious at every turn. And while it is to the use of smokeless fuel that we have to look with the greatest confidence for the future, more especially as regards the dynamic production of heat, it is to any practical improvement in the means of burning ordinary bituminous coal that the attention of nine out of ten visitors to the exhibition will in the first place be chiefly turned. But inventors seem to be so generally aware of the probability that the use of anthracite is likely to follow an acquaintance with its advantages, that most of the grates and fireplaces that are constructed with the view of consuming smoke are described as being also adapted, or readily adaptable, for the consumption of non-bituminous coal.

As to this, there is a primary difficulty, the disregard of which has led, and must continue to lead, to failure and loss of time. The quantity of unburned fuel that escapes from the combustion of flaming coal in the form of smoke is, to a very great extent, dependent on the skill and care of the stoker, or lighter and watcher of the fire. Costly and ingenious as are some of the designs for "mechanical stokers," there is no possibility yet shown of superseding the human element. If house fires and furnaces were required to burn on day and night without intermission or alteration of intensity, something might be said, perhaps, in favour of a really automatic supply of fuel. But this condition rarely, if ever, exists. More heat is required at one time than at another. The skill of the fire-maker is always in request, whether he feed and regulate the flame directly, or whether he superintends more or less cumbrous arrangements for the purpose. Thus the prime element of the problem,—the presence of the perfect stoker,—which may be said, in most cases, to afford the practical solution of the difficulty,—is one which no inventor can supply. In very many cases it is little more than loss of time to attempt to do the work of care, skill, judgment, and watchfulness by the substitution of mechanical appliances.

Another difficulty underlies the practical application of the principle which, in one guise or another, makes its appearance in so many of the contrivances which, on the assurance of their inventors, we are invited to accept as preventive of the escape of smoke. This is the conduction of the smoke-laden current that arises from the fire through descending or ascending flues, in such a manner as to pass a second time through the incandescent fuel, or over the flame, in order to consume the carbon driven off as dust,—or, in plain terms,—the smoke. Our recollection of this fallacy extends for a long period of time,—back to the invention of the Arnott stove, and the lecture on the same by the inventor, Dr. Arnott, at the Royal Institution. In many of the stoves or flues that come under this category a very admirable effect might be produced if the current of air would take the exact course shown on the diagrams. But there is, unfortunately, some doubt on this point. When a short cut can be taken by the air, which is almost invariably the case, the elastic fluid may obstinately refuse to take the longer course which presents so many advantages to the consumer. In point of fact, a circulation is assumed, as invariable, which is very rarely found to exist. Different plans for mixing regulated doses of warm air with the fuel in course of combustion will, no doubt, receive due attention in the reports of the executive committee. But in each and all of these cases the services of the competent stoker are usually a *sine qud non*. And then the question arises,—will not the competent stoker produces a good and as thorough a combustion, with as little loss of unburned carbon in the form of smoke, by a simple, well-proportioned furnace and flue, as by the most complicated arrangement of smoke passages?

What may, however, be effected by a branch flue, or double chimney, is very admirably shown by the powerful and beautiful lamps with which, under the title of Regenerative Gasburner, Messrs. Siemens illuminate the conservatory on the Exhibition premises. Here are up-draught and down-draught, perfectly distinct, each performing its proper function, and that with the result of extracting a very considerable part of the theoretic luminous effect of the gas burned. But it must be remembered that the conditions under which this is effected are altogether different from those of the domestic fire. No gradation is required. The lamp may be lighted, or unlighted; but is not required to give varying light. In the stove more heat is required at one time than at another. And further, in the Siemens lamp, the action is at once visible. It is intended to be steady and unchecked, and if any fault should occur, attention would at once be called to it by the failure of light. And this steady, evident action of the apparatus is insured by the use of distilled fuel; that is to say, of gas. In the use of bituminous coal in the ordinary fire the two processes of distillation and combustion are to some extent combined. What the inventor seeks, is so to arrange the order, or the local position, of the two actions, as first to vapourise and then to burn. With every new addition of fuel the action is disturbed and complicated. We do not say that it is impracticable to overcome the difficulty. But we do say that the simplest manner in which it can be overcome is by separating the two processes; and that it would be very difficult to do this more effectually than it is done by the gasworks.

One ingenious method of meeting this difficulty deserves both notice and admiration, although we must wait for practical evidence before we can form a conclusive opinion how far the object has been attained. Previous endeavours have failed. The principle adopted is to feed the fire from below, instead of by putting fuel on the top, the object being to pass the roughly-distilled product of the heated and igniting coal through the clear body of the fire. In the reversible grates, the fire-basket is made into a complete cage, and swings on pivots. Thus there is a door to the cage both above and below. The upper door is opened to put in fresh coal, and then closed, and the position of the basket reversed. The fresh coal is thus put undermost, and the fire burns downwards. The idea is ingenious, and the public will await with interest the report of the committee on the action of the grate. But when we remember the way in which the introduction of what was probably the best lamp invented before the Moderator was absolutely blocked by the impossibility of making the servants who trimmed it reverse it for a few seconds during the operation, we cannot but point out that to expect the ordinary domestic to reverse a grate by the use of a poker as a lever each time that coals are put on, is to be sanguine rather than guided by experience. Another smoke-consuming kitchen-grate is fed at the bottom by a feeder, in the shape of a hoe. It struck us that there was a want of neatness in these underfed fires; and though we are desirous not to anticipate a well-considered verdict, we cannot too strongly point out that the difference between the ease with which an instructed person whose business it is to show an invention, can perform a simple though unusual operation, and the manner in which the same action would be performed by the legion of assistants who come under the orders of housemaid, cook, or groom of the chambers, is likely to be very wide.

Distinct from the endeavour to economise heat by the combustion of smoke and smoke-laden gases, are those inventions that attempt the same object by radiating the greater part of the caloric produced by combustion into a room, instead of sending it up through the chimney. In other words, the close stove in various shapes forms a separate class of exhibits. It is well known that in Austria, Belgium, and other parts

of the Continent great economy of heat is obtained by the use of the close stove. In some of these contrivances a small quantity of fuel is consumed freely for a short time, and the stove is then closed, sufficient heat being produced to radiate through the day, a more or less sluggish combustion being generally maintained. It should be remembered, however, that both the architecture of the houses and the habits of the people where these stoves are commonly used are in accordance with the requirements of the method. The rooms are generally much more lofty than with us, and the effect of a stove-warmed room on a person unaccustomed to its atmosphere is often very painful. We are slow to recommend a substitution of the stove even for the wasteful, but healthy, open fire. Among the stoves which are exhibited, however, it would be difficult to speak in too high terms of the artistic merits of Lönholdt's anthracite stove, from the foundries of Gebr. Buderus, at Hessen. We do not recommend the introduction into a sitting-room of the "Parlour Stove," however applicable it might perhaps be found in a hall, because of the dose of carbonic acid gas which must certainly be evolved by the combustion of the anthracite. But as a handsome piece of furniture especially as to the details of the castings, this stove may be thought to justify the Diploma of Honour awarded to it at the International Exhibition of Patented Articles at Frankfort-on-the-Main.

At the same time, we are far from recommending the use of iron stoves for the dwelling. If stoves are to be employed, there are very strong reasons in favour of the use of earthenware rather than metal for their material. And here, as in so many other appliances for the purposes of domestic health and comfort, Messrs. Doulton, of Lambeth, come to the fore. We are by no means implicit believers in testimonials; but it must be admitted that the testimonials printed in favour of Doulton's radiating tile-stoves are such as to make out a very good *primâ facie* case in their favour in places where a stove is admissible. The advantage claimed for the use of fireclay as the material for a stove is due to the extraordinary facility of this substance for rapidly absorbing heat, and of gradually radiating the same in such a manner as to produce and maintain for a great length of time an equal temperature. A stove burning for twelve hours will continue, Messrs. Doulton say, to warm a room for several hours after the fire is out. These results cannot be obtained with iron stoves, as the metal absorbs the heat so rapidly as to become over-heated, while it allows it to escape too rapidly to maintain an even temperature. The frequent ill-effect of the iron stove, in what is called "burning the air,"—as to the chemistry of which we do not at the moment propose to speak, but as to the ill-effects of which, even in the case of pipes heated by steam, we can speak from painful personal experience,—is absent, the inventors say, from the fireclay stove. We cannot speak from personal experience in England of rooms warmed by clay stoves; but we know quite enough of the difference of behaviour of iron and of fireclay to admit that there is much probability in the statement of Messrs. Doulton. The list of the exhibits of Messrs. Doulton on page 11 of the Descriptive Catalogue refers to an advertisement which we do not find in our copy of the work. The exhibits mentioned are: Portable radiating fire-stoves, with ventilating tile-shaft; down-draught radiating tile-stove, for centre of a room; large tile-stove for public buildings; and fittings and decorations of ornamental Doulton ware for the adornment of open fireplaces.

There are many other contrivances of more or less ingenuity on describing which we feel tempted to linger. But it is our wish to afford to our readers not merely the amusement of a spare half-hour, but advice which they will find it of value to follow. And, therefore, when, by the exertions of a few earnest and thankworthy men, a visible result of the exhortations which have been so frequent, and of such long standing, in our columns, to make a scientific study of the subject of domestic combustion is before us, we hold it better to wait for the outcome of the experiments now in progress, than to give any hasty, and necessarily imperfect, judgment. One thing struck us which should not be overlooked. As far as we can gather, there is no plan proposed for the combustion of bituminous coal, which claims absolutely to prevent smoke *while the fire is being lighted*. But it is precisely at this time that the great production of smoke takes place. Apart from those factory chimneys, the regulations affecting which are enumerated on page 2 of the Catalogue of the Exhibition, the chimneys of every great town are for the most part only intermittent producers of smoke. From a bright, well-made fire, burned under a chimney of adequate height,—for height is the main cause of draught in a chimney,—steady combustion usually allows but little unburnt fuel to escape in visible form. It is when the fire is just lighted, when it is made up, in the case of the kitchen fire, for dinner, or when half a bushel of slack coal is shot into the grate by a slatternly servant, that visible smoke escapes from the chimney. In such a case as the revolving grate, there is a direct effort to meet the difficulty of putting on coal. But the difficulty of lighting is here untouched. And although we are far from saying that there is not a constant hourly contribution to the smoky canopy of London,—as, indeed, out of a million fires, from 700 to 1,000 must be fed every minute of the day, for one time of feeding alone, yet the morning production of the smoke-cloud which first blackens the fog, is the chief cause of the pollution of the London atmosphere. And this morning pollution, as well as the intermitting contributions to it which occur whenever the fire is fed, we have the most serious doubts whether any contrivance will materially diminish, so long as bituminous coal is burned undistilled in our houses.

We trust that the attention of the committee will be distinctly directed to this point. We have no desire to speak dogmatically upon it. But it seems to us that, before endeavouring, at great pains and cost of time, to award the palm among various contrivances for the consumption, or the prevention of the formation of, smoke from bituminous coal, it would be well to allow science to utter a warning voice. If it is possible to say that, "by invention A, or by the better development of invention A, it is practicable so to burn ordinary coal that no smoke will be produced in lighting or in mending the fire by an ordinary servant, or by a person ignorant or careless of the principles of combustion," then a great boon will have been given to the metropolis, and no time or pains should be spared to make the truth universally known. But if it be, on the other hand, the case, that all that can be said is, "By the careful use of invention A, by an educated and skilful person, very little smoke will be produced except just when the fire is being lighted, or roughly mended," it will be well that this also should be distinctly told. For then, it may be added, it is idle to expect much abatement in London smoke except from the compulsory use of smokeless fuel.

Another point deserves careful attention on the part of those who have to present the public with the digested outcome of the examination of the various appliances exhibited at South Kensington. The prevention of smoke, important as that object becomes in the case of crowded cities, is really but a small part of the improvement possible in domestic combustion. The subject of the economic use of heat is one which the present century has seen pass from the dominion of rough practice to that of definite science. It is not so many years since we had any idea of what heat really is. The remarkable phenomenon of latent heat was known to the steam engineer for a long time before he discovered what was either the meaning or the cause of the loss of thermometric elevation, when the invisible energy was doing mechanical work. We think that we can state without fear of contradiction that it is to that Nestor of European engineers and inventors, John Ericssen, K.V., the father of the ironclad monitors, that the world owes the first serious, sustained, and successful attempt to catch,—or as he called it, to regenerate,—the heat which, having done its work, or, at all events, having done work, was on its escape into the free atmosphere. We can personally remember the efforts of Ericssen in this direction as far back as the year 1835. He had at that time constructed a caloric engine of considerable size; and on the principle then first introduced into mechanics, is based that small caloric engine which is at the present moment so great a boon to the man who requires small, manageable, and cheap motive power. We have before now mentioned the splendid work in which, under the modest title of "Contributions to the Centennial Exhibition," Capt. Ericssen has given a brief compendium of the labours and inventions of half a century. His locomotive, the Novelty, it should be remembered, far exceeded any competitor in the trials at Rainhill,—failing to obtain the prize only by accident. We think that the committee would at once render a graceful tribute to one of the pioneers of all, or nearly all, important improvements in combustion, and secure a valuable addition to the outcome of their labours, if they were to invite from this honoured veteran an expression of his opinion on the primary question which we have above indicated. "Is it practicable to burn bituminous coal for ordinary purposes without smoke?" The value of determining this preliminary question would be this, that the whole force of the great army of inventors would be thus guided in that direction in which success is really to be attained. But in the meantime it must be remembered that there are not a few inventions at South Kensington of which the main, and the successfully pursued, object, is the economy of heat. As to this, a special report, or branch of report, should be prepared. Supposing it to be the outcome of the best scientific consideration that the only reliable mode of avoiding smoke is to consume smokeless fuel, the exhibition, however it answers as to smoke, will be anything but a failure, if it affords to the architect full light on those appliances by which heat, however produced, is best to be utilised for domestic comfort.

We are assured that the doors of the exhibition are by no means as yet inexorably closed against fresh exhibits. A second edition of the catalogue is in course of preparation, containing more information than is furnished by the first. In this we shall expect to find some statement as to the prizes to be awarded, and as to the principles on which the awards are to be given. Dr. Siemens, we understand, has offered a prize of 100 guineas. A like amount, divided into two sums, is named as a lady's prize for the best domestic open grate, and the best kitchener. There is a medal offered by the Society of Arts, and 50*l.* is contributed for prizes by the Manchester Association for Controlling the Escape of Noxious Vapours. It is anticipated that one of the Royal family will consent to give the prizes to the successful competitors. In its actual condition the exhibition must be regarded rather as a comprehensive invitation for all persons who have any improvements to suggest as to consumption of fuel to show them, than as a special inquiry into the means of abating smoke. It is obvious that there will be much room for heart-burning if it is not made plain as soon as possible for what prizes are to be offered, and by what means they are to be earned.

THE MUNICIPAL GOVERNMENT OF PARIS.

At a moment when the voice of public opinion is claiming in many quarters what is understood by a reform in the municipal government of London, and when the subject promises shortly to engross the attention of our rulers, it may not, perhaps, be considered inopportune to lay before our readers a sketch of the administrative system by means of which the city of Paris is regulated in a manner which justly excites some admiration. Paris, as the capital of a great country, as a city containing over two millions of inhabitants, and possessing at the same time all that peculiar character which we are accustomed to expect,—and are justified in the present day in expecting,—from a great centre, offers, it will be readily admitted, a model in the simplicity and effectiveness of its organisation. Paris, again, being known to so many Englishmen and Londoners, affords that further advantage that the results obtained by the administrative system in vogue on the banks of the Seine are comparatively familiar to every one who has visited the French capital. A central and undoubtedly united administration, such as is urged as necessary for London, exists in full force in Paris. While, at the same time, each individual portion of the capital finds its interests amply attended to by the central administration, the whole capital is benefited by the united action of its self-elected rulers, who take into consideration the innumerable, varied, and necessary questions, the satisfactory arrangement of which constitutes what is understood by a well-organised community.

The contrast afforded between the Paris of to-day and the Paris of thirty or forty years ago, with its narrow, ill-kept, ill-smelling streets,—readers of "Pelham" will recall one of that hero's unhappy accidents in the streets of the Paris of pre-Haussmannic days,—singularly shows what, under a central system of municipal

government, is possible in a modern city. Only, indeed, by a thorough organisation could such results have been attained in Paris, and only, let it be remarked, by the united action of corporation and ratepayers. Paris stands to show us what a great city may be made under a few years of management of intelligent and earnest rulers. There have, it is true, been conditions under which the Paris municipal authorities have been peculiarly assisted in their task. We well remember a late editor of *Punch*, — Shirley Brooks,—on a return from Paris jokingly regretting that London could not be placed for a short time under the control of a despot; but what better or more potent despot should our great city find to work its improvements than its own inhabitants, who, as ratepayers, have it in their power to effect the utmost that a governmental despot has been able to carry out on the banks of the Seine? But can it be justly said that the thorough system by which the huge network of drains in Paris is kept, the water and gas supply ensured, the broad streets watered and swept each day, the houses daily cleared of their dust and refuse, the trees planted, the seats distributed, the "squares" and parks tended and beautified, the statues erected, the police, the fire-brigade, the omnibus and other services of locomotion controlled, &c., can it, we repeat, be justly said that the systematic organisation of all this is the work of despotic influence? To that influence Paris may be said really alone to owe its broad streets and boulevards ruthlessly cut through whole neighbourhoods; the rest is the work, practically, of the ratepayers in the persons of those whom they have elected to represent their interests. Should this be the case, it would go far to prove the truth of the accusation that Londoners do not, as ratepayers, sufficiently interest themselves in parochial affairs; but be this belief unfounded or not, there still remains the want with us of an organised system such as our neighbours have to thank for the comfortable and cleanly management of their model capital.

Foreigners, to use that somewhat vague term in its ordinary and generally-accepted sense, have been always credited by us with a genius for organisation, and, indeed, in comparison with ourselves the reputation is merited; but France, above all other countries, has always received the first place as the home of organisation. Inquiring English travellers are astonished to find the comparative simplicity of the administration by means of which a large country is managed, in a manner so different from our own system. The broad divisions into *départements, arrondissements, cantons*, and, *communes*, and the various officials, mayors, &c., who regulate the whole, are soon mastered, and for one part of the country it is the same as for every other. Paris, however, let it be remembered, though regarded administratively as a large *commune* or parish, is, from its huge population, submitted to a government slightly differing from that of other towns throughout France. Its administration is practically confided to two magistrates, the Prefect of the Seine and the Prefect of Police, both important political posts nominated by the Government in power. Municipally the Prefect of the Seine is a prefect like the other prefects of the departments of France; but, at the same time, he is Mayor of Paris, not, it is true, like the other mayors, elected to that post, but by the nomination of the *parent* Government. With this difference, important as it is, the prefect-mayor possesses the same powers as an ordinary mayor, it being, however, remembered that the special police measures remain in the hands of the Prefect of Police, who thus takes upon himself, in the limits determined by the law, a certain share of the functions of the mayor of Paris. Paris is, in fact, administered by two mayors, independent of each other in their duties, and their admin tration is supervised and controlled by a Municipal Council, composed of eighty members elected from each of the eighty "quarters" of the city. The mayors of the twenty "arrondissements" of Paris,—there are four "quartiers" in each,—are in reality only auxiliaries of the central mayoralty, which sits, with the Municipal Council (at present) at the Tuileries, the Hôtel de Ville,—the Mansion House of Paris,—not yet being ready to receive them* The mayors of the "arrondissements" are local delegates of the mayor of Paris, and were it not for the gratuitous nature of their functions they might be called *employés* of the City Government. Their mayoralties are only branch establishments of the central service, for the convenience of the public; the Municipal Council only having to do with the twenty "arrondissements" of the capital in the voting of their share of the budget, or in the regulation and control of their expenses.*

Since 1871 the Municipal Council of Paris has been elected every three years. Its members, it must be borne in mind, can in no way be considered as administrators; their sole action, indeed, is confined to the power of tightening at need the purse-strings, and in this manner controlling the administration. The relations between the Municipal Council and the central mayoralty entrusted with the government of the city may be said to consist in the following:—The central mayoralty prepares the items of the annual budget, and submits each article to the examination and vote of the Council. In this budget, in addition to the relation of the expense and receipts, there are invariably a certain number of proposals; these are each and all subject to the approval of the Council. All loans, improvements, public works, and such like, can only be proceeded with on an entire agreement between the administration and the Council. On its side, the Council can take the initiative, suggesting to the administration any schemes it may be desirous to see carried out; but in case of non-compliance, the Council have no appeal; the administration and the Council, in fact, reserve each to the other the right of veto, a position which, it is true, occasionally, where mutual concessions are not made, leads to troublesome delay.

For the examination of the budget, the Municipal Council divides its eighty members, as far as possible in accordance with the capacities of each, into seven ordinary commissions, in addition to which there exist seven other special commissions.

The first commission, that appointed to inquire into the *finances*, deals, as may be imagined, entirely with figures; the loans, taxes, rates, *octroi*, or town dues, &c. The second commission is entrusted with the affairs of the central mayoralty (*la mairie centrale*); the *mairies d'arrondissement*; what is understood in France by the *état civil*, comprising the duties assigned in England to the Registrar-General of births, deaths, and marriages; the conduct of what, again, in English we have no adequate expression to explain, the *pompes funèbres* (the duties of the undertaker being entirely monopolised in Paris by this branch of the municipality); the cemeteries, the recruiting of the army, the general management of the church in its varied relations to the corporation. This commission takes upon itself, in addition to these duties, the examination of the municipal libraries, the archives, and the municipal museum now installed at the Hôtel Carnavalet, answering, to a certain extent, to our Guildhall Library.

The third commission,—the *Commission de la voirie de Paris*,† as it is termed,—studies by the reports made to it by the administration, the plans of all proposed new thoroughfares, and the public roads generally, the naming of the streets,—managed in Paris with a consideration, alas! unknown to Londoners,—the paving, sweeping, lighting, and maintenance of the roads. All questions of indemnity for damages are submitted to this commission which likewise has to deal with the omnibus, tramway, and cab traffic of the capital, in its relations with the Corporation.

The fourth commission is entrusted with the "public instruction" and the organisation of charity (*assistance publique*), the communal or parish schools, with instruction in drawing and singing, apprentices' certificates, bursaries in the "lycées" and colleges. Here, again, it may be remarked that the whole scholastic system throughout France is based on an organisation such as we may well envy our neighbours. In the matter of charity organisation this commission has, it may be imagined, a wide field for its labours; among its numerous duties may be mentioned that of an inspection and control,—in its relations with the charity budget,—of the Mont de Piété, the Government in France, as in Italy and Belgium, being the public pawnbroker, the Mont de Piété being one more of those admirable and charitable institutions, the want of which with us and in America has often been regretted. It may be mentioned that this fourth commission has recently named two special commissioners, one entrusted with the preparation and establishment of new scholastic institutions, the other to study the important question of technical instruction.

The fifth commission is called upon to consider the architectural and other artistic adornments of the capital. The squares, parks, walks, plantations, the Bois de Boulogne and Vincennes, the renting of those numerous little establishments, kiosks for the sale of journals, &c., that form so characteri-tic a feature in Parisian street life, the *urinoirs*,—a point admirably considered on the banks of the Seine, where lately have been erected an even greater convenience to the public, and known as *châlets de nécessité*, a hundred of which, architectural features with their polished marble exteriors, have been scattered over the capital. To these duties we must add the commission's consideration of all public notices, and play-bills, these latter not allowed, as with us, to cover every vacant boarding, but neatly posted every morning by a body of special *employés*, on to a number of "columns" as they are called, placed in every thoroughfare for the purpose. Under the consideration of this commission come also the several municipal theatres, and the very important annual item of "encouragement" (by commissions and purchase) "of the fine arts." The management of all public fêtes and ceremonies rests also with this commission, but since the last Great Exhibition a special *commission des fêtes* has been appointed.

The sixth commission, of "drains and water," examines all the various and complicated details of these two most important factors in modern existence; the commission has constantly under examination the water supply from its various sources, as also the navigation, maintenance, and improvement of the canals belonging to the City.

The seventh commission is entrusted with all questions relative to what is understood by the "Domaine de la Ville," the bonded warehouses, the markets, the *abattoirs*, or slaughter-houses, weights and measures, legal difficulties, &c. In addition, the commission has to examine the budget of the Prefect of Police, the pensions to retired *employés*, policemen, and firemen. There remain to mention three special commissions, one entrusted with the organisation of the labours of the Municipal Council; the second examines the important question of unhealthy dwellings; the third has been nominated to examine and report on the annual budget. These special commissions are all temporary, while the ordinary commissions may be said to be permanent.*

Such, roughly stated, is the system of organisation by means of which Paris is ruled, and, let it be remarked, without complaint on the part of the public; ratepayers exercise, indeed, their right to grumble at the expenses laid upon them, but the system enables a strict watch to be placed on the employment of all sums, and every Parisian knows that without expenditure little can be expected, as the American proverb, recently quoted in these pages, has it, "Nothing for nothing, and very little for a dollar." It is not in Paris as it is in New York, governed also by a central municipality; the accounts of the wholesale peculation on the part of the rulers of the "Empire City," which from time to time have reached Europe, must not be dwelt upon ill-naturedly; New York must still be regarded as an experiment,—an experiment, however, the success of which who can deny? The circumstances of the extraordinary growth of the city in a new country must be taken into account. In this matter of misappropriation or misuse of municipal funds it will not be found, we suspect, that a central form of government affords more, rather less, facilities than any other system of city rule. In the case of the municipality of Paris it can, we believe, be shown that enormous as is the annual budget of the French capital,

* When the Hôtel de Ville was burnt by the Communists, the Prefect and his staff moved into the Palace of the Luxembourg; but when the Government was transferred from Versailles to Paris, the Senate requiring the Luxembourg, the Prefect again crossed the Seine to his present quarters in the Tuileries.

* In the preparation of this paper we owe much of our information to the excellent little rate-payers' manual, "Paris Municipal," by M. Lemereux, (Paris, 1879).

† The word *voirie* in French administrative language has two acceptations. In the first it comprises everything relating to the public way (*voie*) and the buildings erected on it. The second is applied alone to those establishments to which is carried, and where is manipulated, the sewage of the capital.

* The Municipal Council also, excepting certain vacations, corresponding to those of the law courts, is permanent; the second Municipal Council (after the existing Government was formed in 1871), elected at the end of 1874, renewed in 1878, held in the three years 250 meetings, its commissions no less than 926. During this time it deliberated on no less than 8,143 affairs.

far exceeding eight millions sterling to two millions of inhabitants, in no modern city are the contributions of the ratepayers so skilfully laid out with a view to that important commercial consideration of a proper return for the outlay.

Having thus sketched the outline of the Paris municipal system, we may find occasion at some future time to deal more specially with the items and management of the expenditure of the annual budget.

LAND TENURE AND TOWN BUILDINGS.

There can be no question at all that the subject of the tenure of the land in England is rapidly becoming the burning question of the day. Much as we hear about the matter of compensation to agricultural tenants for improvements and other things very closely connected with the agricultural interest, yet no person who discusses the subject of agricultural distress in all its bearings fails to touch upon the question of the tenure of English land. More works than one of considerable merit which have recently appeared in the publishers' lists, have dealt wholly with the subject of the reform of tenure of English land, notably Mr. Brodrick's "English Land and English Landlords," a work which is of the utmost value at the present day. But the question is one which has as much interest for dwellers in towns as for those in the country, and architects and builders may fairly claim to be very interested parties. We can scarcely suppose that any one who will regard the subject of land tenure in England candidly and calmly, and without letting political feelings get the better of him, can hesitate in desiring to see the tenure of land made as free as possible. By free land we mean property which the owner can dispose of how and when he likes. At the present time, very large portions,—indeed, the larger proportion,—of our houses belong to a few families, and are in strict settlement. It is quite true that building leases have been granted to builders and others, who again have leased the houses which they have erected, but the freehold houses in our towns are few compared to the great mass of leasehold houses. Now, we may say at once that assuming settlements and the tieing up of land put an end to, it would be Quixotic to suppose that all the leasehold tenants of towns would suddenly become freeholders. There can be no question, on the other hand, that freedom of land would gradually tend to cause the spread of our houses among many owners, and would prevent the great mass of leasehold premises from springing up, which are a consequence of the present system. Into the moral, social, and political merits of the existing system of life tenancies and changes which characterises our land system we do not propose now to enter. Those who desire to see the *pros* and *cons*, will find them discussed in the work of the Warden of Merton College, to which we have referred in Mr. Kay's "Free Trade in Land," Mr. Kinnear's "Principles of Property in Land," an article in the current number of the *British Quarterly Review* on the "Tenure and Transfer of Land," and in various other books and journals.

Let us consider, however, how our towns are affected by the absence of freedom in our land tenure, and would be likely to be by a reform of the existing system. Every Englishman's house is said to be his castle, and that saying means more than most people think. A man who owns a thing absolutely will spend more money on it than he will if he is only a temporary possessor. In these days he has not to fortify it against outward human enemies, but against the invisible foes whom sanitary reformers have long been fighting. We do not for a moment doubt that if the occupiers of town houses were also the absolute owners, the cause of sanitary science would advance at double its present rate. If a person knows that he can be sure of being in the same house forty years hence, or that his representatives will be, or that he or his representatives will be receiving rent in respect of it, he will not hesitate to improve it. Mere seven, fourteen, or twenty years' leases are not enough, for town tenants do not, like agricultural tenants, reap the fruit of their improvements in hard cash; they do so in increased comforts, in greater security against disease, in mental satisfaction at perceiving more graceful shapes or colours. The agricultural tenant who at the end of a twenty-one years' lease, in consequence of having drained fifty acres, has received largely increased crops, has paid back the capital, and received a handsome interest on it, is fully recompensed. But the man who has had his house well ventilated, and raised it an extra story, at the end of twenty-one years has by no means reaped the full fruits of his outlay. Therefore, it is pretty evident that if freehold tenures were more common in our towns, the sanitary and the ornamental character of our houses would increase with much greater rapidity than at present. We will give an example of the way in which the system of leases acts to the detriment of the beauty of our houses. The whole of the east side of Cadogan-place belongs to Lord Cadogan as ground landlord. Fresh leases are, we believe, granted on condition that the tenants spend a certain sum on their houses, and, among other things, raise them one story, and hide the honest red brick by a ghastly winding-sheet of stucco, and place on the top a heavy balustrade. Now harmony is one thing, but monotony is another, and by the time the whole of the east side of Cadogan-place becomes of the same character, it will show to the stranger a long line of dreadful and monotonous ugliness. But, if many of these houses belonged absolutely to their owners, can any one doubt that we should see houses worthy the situation? In that long line of habitations there is not one in which, externally at any rate, the skill of the architect is expended; but, given an absolute owner, he would undoubtedly call in the services of an architect to improve and enlarge his dwelling. We give an instance such as this because it is what may be called practical in its character, and nothing is so telling to an English mind as a hard fact. And the matter may be put in another form, by asking the question, can freedom of ownership deteriorate the aspect of our towns? Any one of observation and experience will answer at once that it cannot, and therefore it must, whatever effect it may produce, work for good. Consequently we think there can be no doubt that, were freedom of ownership to become more common, houses would be much more largely occupied and owned by the same person, and would consequently be more substantially built, would be the subject of many more improvements, and would be more pleasing to a cultivated eye and taste, and consequently that the reform of our land system will tend to make our houses more healthy and more beautiful.

It is sometimes said that if land becomes so easily saleable, rich people will buy it. But even if a rich man does buy a number of houses, he cannot live for ever, and it is quite certain that in time the property will, partially or wholly, come into the market again. But we do not believe that the millionaire will amass property in the towns to any large extent when, as we hope, freedom of ownership shall be the characteristic of our land tenure. A man will only be too glad to invest his money in his habitation if he can sell it when he wishes or leave it to his children, and experience shows that the probabilities are in favour of occupiers purchasing their habitations, and so by degrees we should find our towns owned by a number of persons absolutely, and not occupied by tenants whose great aim and object is to spend as little on their houses as is consistent with comfort and average healthfulness. Consequently, also, freedom of ownership in our towns appears likely to be an incentive to thrift since many a man will try to save money in order that his house may become really his castle. We observed before that the mind of the architect is not visible in the present "monotonizing," if we may coin a word, of Cadogan-place; and this leads us to point out that freedom of ownership by enabling and inducing owners to improve their houses or to build them for themselves would improve the architectural profession throughout England. It would improve business and give greater scope for individuality and taste because at the present day in our towns the architect, considering the number of houses, has comparatively little work. If a nobleman, or a rich merchant, wishes to build a palatial mansion he calls in an architect, but, given an ordinary row of medium-sized houses, the builder takes care to dispense if possible with the services of an architect. Moreover, freedom of ownership would give more employment to builders and scope to a good class of work, the order would not be for "something that will last out my lease," or "just do for my time," but something that will last long and well. Regarding, therefore, all the interests which are connected with our towns, their healthiness and their beauty, the thriftiness and comfort of their inhabitants, a reform of our land system promises beneficially to effect all and each of these. There is nothing to be said in favour of the great London estates of the Grosvenors, Bedfords, and others. All those, therefore, who dwell in our large towns, who earn their livelihood in them, whether as architects or builders, should do what they can to bring about greater freedom of ownership in this country, irrespective of political opinions.

ROYAL SOCIETY OF PAINTERS IN WATER-COLOURS.

The Winter Exhibition of this Society, which opened last week, may be fairly called a remarkable one, when we consider that the exhibition held at this season does not profess to be the principal one of the year. Although some of the greatest names in English water-colour art, which now belong to the past, remain still unsurpassed, and perhaps in some qualities unequalled, there has probably been no period in which such an amount of really fine work, so varied in character and interest, could be got together in a single winter exhibition of "sketches and studies," and the favourable impression which a first view of the present exhibition suggested to us, is only increased by more detailed examination.

Looking first at some of the figure subjects, which are, as usual, the least numerous class, we may direct attention to Mr. Walter Duncan's fine work, rather a finished drawing than a study, representing "Imogen before the Cave of Belarius" (136). We recognised in this painter's earlier exhibits, some seasons back, the evidence of unusual power and expression in dealing with ideal figure subjects. In some more recent exhibitions we have been disappointed in not finding in his works all that he had led us to expect; but the "Imogen," which is his principal contribution this year, is more equal to what we have previously seen from his hand. Combined with very fine drawing and colour there is the higher power of intellectually realising the subject; and after all the pretty and characterless Imogens one has found in exhibitions, it is a relief to see a figure which really seems to embody the poet's idea of the person and the situation. Doubt and hesitation are expressed in the whole attitude of the figure, in the expression of the somewhat care-worn, though beautiful face, and the nerveless grasp of the hand on the unaccustomed weapon. The painter has not forgotten that Imogen, though a lovely and delicately-nurtured princess, is here in the position of one who has undergone much mental agony and bodily fatigue and exposure, and he tells this story plainly in her countenance. We may contrast the work in some senses with Mr. Tadema's "Pandora" (334), a half-length of a red-haired Roman girl, of the type which he has often repeated, who holds a bronze casket. Here the interest is in the rich and delicate colouring of the figure and the accessories, and the completely antique feeling of the whole. The drawing appears to us curiously defective for so masterly a painter. The line of the back is stiff and straight, and the forearm seems out of proportion with the upper part of the limb. The intellectual interest of the figure is *nil*. To call it "Pandora" is an absurd reduction of a great poetic legend to the plainest prose.

Among other figure subjects Mr. H. Wallis sends a very interesting series in which he has turned his studies of the topography and architecture of Venice, and of ancient Venetian costume, to account in a variety of scenes illustrative of the "Merchant of Venice." We have "Portia and Nerissa at Belmont" (69), seated in a richly-marbled interior hearing the message of the "fore-spurrer" who comes before his lord; Portia is one of the Venetian blonde women so well known to us on the canvases of Titian and Bordone, Nerissa a dark girl of evidently inferior social standing; but in this case the character of the figures is not much made out, it is rather a sketch of interior effect. "Shylock, Jessica, and Launcelot" (111) is more distinctly characteristic; the idea of Jessica is very good, she is a pretty little doll of a girl with plenty of mischief in her; she appears again, perhaps to better advantage, in "Jessica and Launcelot" (156), where she has just received the letter from Master Launcelot

The latter is in both scenes a little too respectable-looking and deficient in the comic element. A monochrome study, "Antonio, Bassanio, Gratiano, and Lorenzo" (125), where the two latter are taking their leave (in the first scene), is an admirable realisation of the scene, and of the contrast between the volatile young gentlemen who are making their bow, and the staid and dignified Antonio. "Bassanio unfolding his Plans to Antonio" (235), also a monochrome, is very good. In "Portia and Nerissa on the Morning of the Trial" (11), the interest is again rather in the scene, the representation of the gondola and the gondoliers of the period, than in the character of the figures; the artist seems to have been rather afraid of Portia and Nerissa, and has evaded any very precise delineation of their characters. But there is matter enough in these studies for two or three capital pictures from that perennially interesting and charming drama, some of which we hope will be forthcoming before long. Mr. Wallis seems to be making the subject his own.

Mrs. Allingham continues to exhibit in her various cottage children the power she has of giving interest and beauty to simple figures from English rural life, without imparting to them any character inconsistent with simple and unpretentious every-day life. The "noble peasant" who has been thrust upon us rather pertinaciously by one or two contemporary painters (following the lead of Frederick Walker) has no place in Mrs. Allingham's scenes. We have that sweetness of expression which is really to be found in good specimens of English cottage girls and cottage children, but nothing is exaggerated. The face of the child at "Granny's Gate" (325), and that of the girl "Knitting" (345), are charming specimens of natural unconscious sweetness of expression. "Washing" (370) represents a more matured figure, equally natural. One of the most charming of this lady's works this year is one in which the figures are subordinate, "Cottage at Grayswood" (314), a country lane scene before the gate of a cottage which is nearly buried in a mass of summer foliage, from amid which tall sunflowers glitter; the finish of every detail on so small a scale, down to the cat playing before the gate, is as complete as the total effect. Mrs. Angell, another lady member who reflects the highest credit on the Society, is as perfect as ever in her studies of flowers and birds: in the drawing of two "Foreign Birds" (320) we can fancy that we could lift the feathers with our fingers. Among the lady's several flower-paintings it would be difficult to say that any one is better than the others.

Among the landscapes there are a large number of beautiful drawings and sketches. Mr. Alfred Hunt contributes only one, unfortunately, a rich misty evening view of Durham, remarkable even among Mr. Hunt's works for the manner in which the uncertainty of form and outline produced by mist is given, combined with real certainty and careful indication of all the points of the landscape. Mr. Hunt's misty pictures are almost like nature in this way; as you look into them forms come out through the mist which are not noticeable at first glance. Whether the prevalent tone of warm brown is not a little more like a painter's effect than an effect of nature may be open to question, but this, like so many others of Mr. Hunt's works, has the effect of making us forget that we are looking only at pigments on a flat surface to an extent which few other landscape-painters achieve. In this respect another work in the room is rather remarkable, Mr. J. W. North's "Season of Mist and Mellow Fruitfulness" (31), an autumn landscape with an intertangled foreground of foliage. We have before expressed a doubt whether this gifted artist was not in danger of over-working a receipt for effect which he has invented for himself, and the present work is open to the charge of mannerism, when compared with what has preceded it; but a drawing more full of the real glitter of light, and in which we are more able to forget paint, it would perhaps be difficult to find; it is certainly a brilliant effort. An increased power in the realisation of brilliant and glowing effects of light on foliage seems to have been attained by an old and valued member, Mr. Naftel, whose previously rather quiet and even prosaic drawings are replaced this winter by some studies in which very brilliant and beautiful effects are realised, and a peculiarly delicate harmonious tone pervades the whole. Among these "Bettws-y-Coed Village" (205) and "Golden Leaves" (250) are particularly excellent. The new member, Mr. Wilmot Pilsbury, gives indications that his line of work is less restricted than his first set of exhibits led one to suppose. In his "Worcestershire Hop-pickers" (177) the interest is chiefly in the figures, which, though a little deficient in variety of character and expression, are thoroughly well executed, and lead us to suppose that we may look for good work in subjects of this class from their author. In his landscape, "Wheatfield" (91) Mr. Pilsbury's work still strikes us as deficient in breadth and atmospheric effect; in a smaller drawing, "Corner of a Farmyard" (210) there is some fine work, though this would hardly have been done unless Mr. Boyce had shown the way first. Mr. Albert Goodwin contributes, among other things, two works of rather peculiar *motif*; one of these, "The Invincible Armada" (123), represents the decaying timbers and skeletons of sundry ships left bare on a shoal, and showing dark against a stormy, dull red twilight; it is a work of considerable poetic feeling. "Waiting for the Express to pass" (55) is a powerful sketch of a night effect at a roadside railway station, a waiting train filling the air with smoke and steam, the scene being only fitfully illuminated by the porter's lamp and the lights in the carriages.

Among larger works, Mr. Basil Bradley's "Getting in the Barley—a Coming Storm" (96) conveys finely the idea of the moment when the first premonitory gusts in advance of a thunderstorm are felt, and the figures of men, women, and horses are effectively grouped. The same artist, in "A Study in Rotten Row" (240) has attempted to repeat his splendid success of last exhibition in drawing a lady on horseback, not quite so successfully, though the figure is a very spirited one: the horse seems a little long in the loins. Mr. Clarence Whaite's large work, "The Harvest Moon" (68) is unquestionably powerful, but it is not nature; and perhaps the latter criticism might apply equally to Miss Montalba's large drawing, "Coming into Port, a Sirocco Day, Venice" (227), in which, in the endeavour after the silvery effect which this artist is so fond of, the colour is so faint and so capriciously concentrated on certain parts of the craft only, that it is almost difficult to say at first sight whether it is meant for a coloured picture or a monochrome study. Among the landscapes which are pure and unaffected transcripts of nature, two by Mr. Cuthbert Rigby should be noticed, "The Old Furnace" (294), and "Evening" (208); both represent the character of some special locality where low, heavy, stone-built cottages are planted among somewhat barren hills; in feeling and in realising a special character in landscape they seem perfect. Mr. J. Parker's various little studies of bits of French coast towns are excellent specimens of street architecture sketches, especially "La Lieutenance, Honfleur" (36); and architectural interest of another kind is shown in Mr. G. Andrews's drawing of the Girgenti Temples (17), and in Mr. Carl Haag's general view of "Baalbeck" (164). Mr. Herbert Marshall has made a fine study of "Rotherbithe" (26), and Mr. Otto Weber one of "Greenhithe" (207), with his favourite cattle reposing on the marshy ground adjoining the river; Mr. Marshall's "Durham" (251) should also be looked at,—an interesting contrast to Mr. Hunt's before named.

Among miscellaneous subjects may be mentioned a study, apparently for fresco decoration, by Mr. Marks, entitled "Welcome! the Arrival of the Guests" (200), a good specimen of this artist's peculiar humour in the adaptation of old-world figures to modern subjects: the same artist contributes some characteristic studies of heads (266, 274) representing various types in modern life. Mr. J. D. Watson exhibits two figures under the title of "A Warm Reception" (281), which are very clever, and analogous in humour to Mr. Marks's productions; and there is a fine figure quite in Mr. Watson's own style under the title of "The Student" (315). Mr. E. Buckman's "Cobwebs" (326), an interior of a hayloft with a figure reading by the light of a much-cobwebbed window, should be looked at; it is a very original thing. Mr. A. H. Marsh sends two figure-studies, one of which, "Driftwood" (128), is very pathetic, and has the materials of a fine work in it. Mr. Brittan Willis's "Slight Study from Nature" (115) and "Highland Cattle" (395) are very good specimens of cattle studies; nor must we forget Mr. F. Tayler's "Waiting for the Hounds" (27), which contains as good a study of a horse as one could wish to see. Our list by no means exhausts the good points of this admirable exhibition.

SIR F. LEIGHTON ON ART.

THE President of the Royal Academy, in his address last Saturday, on the occasion of delivering the prizes to the successful students of the year, took opportunity to deal with one of the most important considerations which can be entered into in reference to the objects of art and the conditions under which artistic work is to be carried out. What, he proposed as his theme, is the relation of art to morals and religion? It is only in a period when art is not exercising her highest activity, when she is somewhat fettered in her powers and doubtful in her aims, that such a question would be raised at all, and the fact that the President of the leading body of artists brought it prominently forward and devoted so much time to its consideration on such an occasion, must, we fear, be regarded as in one sense a proof that art is hardly in so healthy a condition at present as Sir F. Leighton evidently wished his hearers to infer that it was. In great periods of artistic production, whether in sculpture or painting or music, the great question is how best to master the difficulties of the art and evolve the most complete productions possible. It is not then the question, to what end do we do this or that in art, but how can we do it best? and the mere achievement is an end in itself. It is, however, of no use to ignore the fact that we are at present in the midst of many "obstinate questionings" about art; no one who takes the wide view of the subject in relation to contemporary thought and manners which Sir F Leighton might be expected to take, can ignore their existence; and he may have done good service to some hesitating minds by his review of the position, and the tolerably decisive answers which he gave to some of the heresies, as we may call them, of the day in reference to the *raison d'être* of art.

In regard to what may be termed the religious view of art, every one must be aware that this has been very strongly urged of late years, though we should divide the art-religionists into two types, which Sir. F. Leighton did not distinguish, but which we think are strongly marked. The one is the church party, represented mainly by some enthusiastic amateurs, who proclaim art to be *ancilla Domini*, the "handmaid of the Lord," and regard the furnishing of ecclesiastical decoration and ecclesiastical paintings as the chief and most noble end of art. The other is the much larger class, of whom Mr. Ruskin and some of the once so-called pre-Raffaellite brethren are the most prominent leaders, who are not specially ecclesiastical in their leanings, but who very decidedly proclaim that the end of art is to inculcate moral truths, and that without that end it is but elaborate trifling. Sir F. Leighton, in alluding to the lengths to which this moral and religious, or we might even say ascetic, view of art, had been carried, mentioned that he had met with the idea, among some of the German painters, that even a love of rich colour was a sensuous and to some extent immoral indulgence of the lower part of the artist nature, arguing a depraved taste. It is a curious contrast that in England, so far from our having adopted any such extreme view as this, the love of rich colour has usually been very predominant in the theory and practice of the "moral" school of artists in this country. But the idea that art must have a moral end is nevertheless very strongly urged by certain of our artists, and with the more effect that it falls in precisely with some of the predominating traits of English character, especially English middle-class character. The sensitiveness to beauty for its own sake is not prominent in the English national character. The idea of moral duty and responsibility is, on the other hand, very strong in our national character, with which therefore the moral theory of art precisely falls in. A large proportion of English people would entirely sympathise with an artist who should proclaim that his works were all produced with a distinctly moral aim, although such a proclamation would in reality be no more reasonable or valuable than Artemus Ward's advertisement of his "highly moral waxworks."

The arguments brought forward in favour of this view of art as a moral agent are of two different kinds. The one involves the assertion that, as a matter of historical fact, art has been

greatest when pervaded mainly by a religious motive. The answer to this is simply, we do not see or feel this alleged superiority, and the world at large has decided in the same sense. Sir F. Leighton brought forward, as a kind of *reductio ad absurdum* of this part of the moral argument, the example of the Spanish school of painting which flourished under the most direct influence of the ecclesiastical idea, the school of which Morales and Luis de Vargas are examples, and asked who would claim for these men, valuable as in some sense they were, a place alongside Velasquez, "the most mundane of painters, and Shaksperian almost in the width of his mental objectivity"? The argument drawn from the growth of painting in Italy he admitted to be "more specious," and in reference to it the President drew attention again to the precise nature of the position taken up by the moral and religious school, the promulgators of the "didactic theory": "it is, that the moral edification of man being the highest duty of art, those productions of art will take the highest rank which teach, with sincerity and of a definite purpose, the greatest number of moral truths, and that the painter who (the artistic gift being, of course, postulated) aims most constantly at the promulgation of these truths will produce the greatest works. You will at once feel that these assumptions, if accepted without reservation, sap at the roots of all free criticism, practically substituting for it a foregone conclusion. A critic who approaches a work of art under their influence will instinctively gauge it in accordance with them. . . . . Now if, on a review of Italian art from its rise to its zenith, we ask ourselves which works have by the consent of the vast majority of the intelligent been pronounced the most mature and perfect, we shall not find that verdict harmonising with one which should be built up on the axioms of the didactic theory; we shall, on the contrary, find that the evolution of art in Italy, an evolution singularly organic and continuous, bears no ratio, unless it be an inverse ratio, to the religious life and development amid which it ran its course." It is useless for moral enthusiasts in favour of the religious view of art to protest the contrary, to say that they find more true greatness in the art of Cimabúé than in that of Titian, for the verdict of the vast majority of educated minds has fully decided to the contrary, and in such controversies, which admit not of mathematical argument, *Vox populi vox Dei*, though in a rather different sense to that in which the proverb is generally used, is the ultimate test. The progress from the phase when Italian painting was under the dominion of the ecclesiastical idea to that of its fuller and freer life, is very well indicated in Browning's famous poem, "Fra Filippo Lippi," where the clever but scapegrace painter tells his audience how the monks were scandalised at his painting men and women just as he saw them, instead of painting things to edification. The whole poem makes a very good commentary on some portions of Sir F. Leighton's address.

But apart from the historical aspect of the matter, it is perfectly true, as Sir F. Leighton observed, that this idea of a high moral and didactic end in art appeals with great force to many serious and earnest minds. He made a very good reply to that view of the subject in reminding his hearers that one effect of the adoption of such a view of art must be to remove from among the category of the arts one of the most beautiful, that of music. Scarcely any one has ever pretended that music can in any manner represent moral ideas, and it would certainly be difficult to see how an argument which would shut the mouth of one art altogether can be logically applied to another. The answer is, not that ethical truths and ethical teaching are of inferior importance to art, but simply that art is not the medium for the advocacy of ethical truths. The President pointed out (and in these pre-eminently scientific days the illustration is especially effective) that precisely the same limitation applied to science; that science is not concerned with reading moral and religious lessons, but simply with investigating nature. That moral deduction may be drawn from or suggested by great scientific discoveries may be true, but it is not the business of the man of science to draw them; it is his business only to find out and promulgate scientific truth. In like manner, the artist who makes it his end to promulgate ethical truth is employing a very roundabout means to that end,—speech or writing would answer the purpose much more directly; and he is at the same time liable to fall short in what is the legitimate province of art, the promotion of intellectual enjoyment.

There is, however, we may be allowed to add, one sense in which an artist may be said to exercise indirectly a moral influence through his art, and that in a sense quite in keeping with the application of his mind to the legitimate objects of art. What we mean to imply is this, that in proportion as the artist gives his best and most strenuous endeavours to the perfecting of his art, and gives evidence in all his work of serious thought and study, in so far will his works, in addition to the pleasure which they afford, exercise a healthy and bracing influence on the minds of those who contemplate them,—an influence which at least predisposes the mind to moral energy and effort: while a slackly and carelessly studied art, however "religious" the subjects may be with which it deals, has an enervating effect on other minds. It would not be difficult to call to mind instances of this not far from home: examples of great "religious" paintings which the public are exhorted to go and see for the quickening of their religious sympathies, and which represent false, hasty, flashy, and therefore, in a sense, immoral art, produced hastily to win a cheap applause. All such art has its bad effect in the long run, just as all art which bears the stamp of serious artistic purpose and endeavour after the best that can be done, carries a moral with it, though not in the same sense that the didactic school of critics mean by moral teaching. This point might have been a little more brought out in the President's address, which, nevertheless, was an excellent contribution to the consideration of the important subject with which it dealt.

"BARNACLES."

This was the title of a paper read before the Architectural Association on the 9th inst. by Mr. Cole A. Adams. After some introductory remarks, in which the various meanings of the words "barnacle" and "barnacles" were quoted, the author proceeded to speak of the "barnacle" as a shell-fish, observing that no matter what subject the "barnacle" attacked, he invariably "went to the bottom of it," with a persistency and method which were very highly to be commended to, among other people, architectural students, whom he advised to cultivate the habit of mastering one subject of their studies at a time, as the pursuit of such a course would give a breadth and power to the mind. The difficulties which beset the modern architect who aspired to hold a high position in his profession were Herculean. In those ages when the art was a living one, and when it was natural to build in one style, with all the life and surroundings in harmony with it, the task of designing must have been an easier one, comparatively speaking. No question of "style" would arise; doubtless there were schools of thought, and variety of design, but it ran in the same direction, and was, so to speak, academical, governed by fixed laws and principles. At the present time what chaos reigned, what confusion of styles! The student looking abroad in these days was bewildered, and needed, in fact, to put on "barnacles" to assist his mental vision. Sorrowfully, perhaps, he looked back nearly half a century to the time when men saw that Gothic was fair to look upon, and enthusiastically took up its study. He might smile at much that was done, but he could not but love those who had gone for the faith they had. Now the great Gothic wave had spent itself,—had done its appointed work,—and a restless nineteenth century craves for other food. It was to be regretted that a certain amount of indifferentism had sprung up in the profession, and that men were pandering to a taste and working in a style,—or no style,—in which belief was wanting. Architecture, chiefly in civil and domestic buildings, had caught a kind of scarlet fever, and entered upon a phase of its history which might be called "the red and rubbed brick era." For ecclesiastical work Gothic still claimed the largest share, and we possessed buildings which showed an extraordinary advance upon what was done only a few years back. The works alluded to (those of acknowledged masters of the art of architecture) were distinguished by greater breadth and less fussiness. The details of a cathedral were not stuck upon a parish church; large wall surfaces were left to tell their own tale,—to suggest repose and to heighten features and detail,—the latter more sparingly applied. Adverting to the "Queen Anne" style, Mr. Adams observed that there was much that was lovable about it, and when its features and characteristics were duly kept within bounds, great piquancy of effect might be gained, and dignity also. Unfortunately, in the rage for novelty, men had overlooked or forgotten the lesson which the modern Gothic masters had learnt. Sketch-book detail again made its appearance,—frequently without rhyme or reason,—and buildings were stuck about with the most extraordinary-looking "barnacles,"—memorial-tablet detail, porches stopped off at the bed-mould of the cornice, and pilasters like Sir Frederick Leighton's description of Cleopatra's Needle in its new home: "emphasing nothing, by nothing emphasised." Wide openings covered with flat arches, so thin that they could not hold themselves up alone, and which had, for their own support, as well as for the weight they should carry, concealed iron girders; ironwork painted and made to look like woodwork, so as to escape the Building Act; these and other eccentricities too numerous to mention were "barnacles" so persistent and parasitical in their growth that they eat into the very life of architecture, and bring its practitioners into ridicule. These things were done by men who knew better, and it was to such work that many students looked up, finding it to be fashionable. Was this the kind of work that would make the student honest and truthful in what he did? Could it be reconciled with the motto of the Association, "Design with Beauty, Build in Truth"? One great lesson to be learnt from "barnacles" was that "Unity is strength." Architects had too long failed to recognise and act upon that lesson, although a notable instance of the power for good resulting from its recognition was seen in the Architectural Association itself. After some further remarks under this head, Mr. Adams proceeded as follows:—

It would seem to be the tendency of modern times to subdivide labour, and more and more we see that specialism is spreading. In all other professions we note this sub-division of labour, and there are signs, not to be disregarded, in our own. Church restoration and church building are for the most part in the hands of comparatively few men; this is more notably the case when the church to be restored or built is in the hands of a committee, and many a man, probably every bit as competent, is set on one side because Mr. Somebodyelse has been fortunate enough to be better known as a church restorer or builder. Again, in school, workhouse, and hospital building, in sanitary engineering,—alas! here as a profession we have ourselves to blame,—much that would come to us we have as a body turned from as beneath our serious notice. This work and much else has drifted into other channels, and is no longer thought by the public to belong to the profession of architects. Does it not, therefore, behove us to be looking well into this matter, and if specialism is to be the modern order of things, for a young man to consider carefully where his particular bent may lie, and then to turn his special attention in that direction, after carefully weighing his future prospects, if he has any, of getting work? To do this, there can be no doubt that a general study of his profession will be the wisest course to pursue; but, with a definite aim before him, he will cultivate more assiduously that particular study which will fit him for the place he desires to succeed in, and, taking a leaf out of the book of the young barnacle, will devote all his energies to getting a firm grip of it, going beneath the surface and making himself master of the situation. Doubtless, perhaps without knowing it, most men follow their particular hobby in work. I only speak of those who are really in earnest about it, and who mean to succeed; but if in the future this sub-division of work is to be a recognised feature, then it will not be wise to neglect the signs of the times. Specialism, I suppose, of all kinds, has a tendency to become cramping to the intellect, and somewhat tyrannical in its effects; on the other hand, in the liberal and mechanical arts, we do find and must recognise that men whose whole time and energies are devoted to special branches, in painting and sculpture, or the making of particular machines or articles of manufacture, attain a precision and accuracy which are very remarkable, and seemingly only attainable by such a system. In Medicine and Surgery, we see essentially this system of specialism; and in our sister profession of engineering, we

have its members devoting themselves to separate and distinct subjects, and obtaining in each the most marvellous results, for

"These are the works of the age, the marvels of men and of mind."

But architecture, which is as old as the hills, is more conservative. Most of us hitherto, in practice, lay ourselves open for each and every thing that may come in the way. But our masters, the public, are becoming more critical; art education is telling its tale, and clients look about for themselves, look with discriminating eye before they decide upon whom they will employ, and often choose the man who has given special evidence of his capacity to meet the requirements which they need. Do we not ourselves use this discretion? Formerly we went to the general medical practitioner for every ailment, but now if it is within our means we go to the man whose reputation lies in healing the eye, the liver, the lungs, the brain, rheumatism, gout, and the many other ailments flesh is heir to; and then in surgery how many are the divisions? Certainly here the system seems to work well; certain it is that the public think so too, and it would be useless for the medical profession to disregard the facts or fight against it. So far from doing that, we find that general practitioners rather encourage it, and when in difficulty consult the specialists, and send their patients to them for advice, and act with them in consultation. No jealousy exists, and science is undobtedly advanced by the powers of the mind being devoted to the mastering of one subject.

Engineering, too, as we have noticed, includes branches too numerous to mention. It would seem, then, only natural in the order of things, that in our own profession we shall see the same barnacle action taking place, for your barnacle is a specialist too. If with the spread of knowledge, of science, and of art we are to hold our place before the world, it must be as men proficient in what we undertake. So numerous now are the various works that the architect is thought to include, and be master of, that it is simply impossible in the time at his disposal that he can be a proficient in all of them. Work of every kind and description connected with architecture is daily, one may almost say, being filched from us, and men and companies are started for doing that which would be better done by architects who, trained in youth to the profession, elected a particular branch or branches to practise in. Our work is frequently done by men who have only a slight acquaintance with the art and science of architecture, and professional architects too often get the blame. If, instead of this, special branches were taken up by men educated as architects on a broader basis, I think we should see much the same result as exists in the medical and other professions, and we should have a class of specialists who could be called in in consultation by their professional brethren as necessity arose. In alluding to this subject, it must be borne in mind that such remarks apply more particularly to the city we live in, and other large cities, but we cannot look abroad without seeing how this tendency to head centres is a feature of the age.

The advantages to be gained by this system would seem to be this. The profession of architecture would stand better in the eyes of the public by the proficiency of men in i's various branches; work connected with building, &c., instead of drifting into other quarters, and being done by men who have little or no knowledge of architecture, would be kept in the profession and be looked upon as belonging to it. A slight acquaintance with the work of outside specialists is enough to show how hideous they can make the work they touch, and how in their desire, and a worthy one it is, to make their own work successful, they utterly disregard all considerations of the claims of art. They are, it is to be feared, too often glad to show that architects know nothing about the particular branch they take up. But already the public is alarmed at the cost of sanitary reform initiated more particularly by these specialists, and the accounts we hear of the cost involved are sometimes startling. Now we have this matter a good deal in our own hands, and much else, such as warming, ventilation, &c. A general knowledge, at all events, of principles and practice, is essential to every practitioner, but if we had more men like those who read papers and spoke upon the subject of sanitation, &c., last session, we should be able in any difficulty, with the consent of our clients, or on our own behalf, as the case might be, to call in one of these gentlemen to advise. Now, there would be nothing *infra dig.* in such a course, for, as we have seen, it is so in other professions. A feeling of *esprit de corps* would animate the consulting and consulted architect, and the advice would be given with a knowledge of the whole case and all its difficulties, both working in the same interests for the benefit of the client. Again, in special matters of construction, design, decoration, and what not, the same system could be adopted more than it is now, to the great gain of the public and the profession. And the esteem of the former would be increased, if our employers found that we contained in our ranks all the elements for meeting whatever question arose without going to outsiders for information, and involving them in large extra expenses thereby.

There are barnacles and barnacles. Some spend their lives at home, others are great travellers,—visit many countries, cross many waters,—but beyond sustaining the life that is in them, apparently gain little advantages from this mode of spending their lives. The moral that we may draw from this is that there are students and students. Some, from necessity or inclination, stay at home, and some are fortunate enough to be able to travel and visit many countries. The pursuit of the beautiful is a necessary study for all who aspire to the highest qualifications of an architect, to be, before and above all else, an *artist*; but, to make use of his studies, he should not only be a sketcher of what will look pretty in his sketch-book, but should observe the object upon which his attention is turned, and try and discover in it what was the motive of the man who executed the work, the materials of which it is composed, the colour which charms, and how this pleasurable effect of colour is produced, whether solely from the kindly hand of time, or intentionally. Then the plan,—generally one of the most important factors,—the mode of construction, the height from the ground and from where viewed and intended to be viewed. Now, all this necessarily takes a long time, and nineteenth-century rush so pervades our modern system that few will take this trouble. To pursue such a course of study will not fill the sketch-book, and is too irksome. I think we often place too much importance upon the sketch-book as a show-book. I remember, some years ago, when seeking employment, showing my sketches to a very distinguished architect. He was kind enough to compliment me upon them, but added, "I should better like to see them loaded with figures." There is no doubt, I think, of the wisdom of such a course. Your drawings will not look pretty, but you will have facts to correct fancies, and I think no one who adopts this course regrets it. You see some pretty little piece of architecture, sketch it, gloat over it, and show it to your friends as something very choice. Years after you wish to refer to it; then, may be, your recollection of its plan, situation and construction, the materials of which it was composed, are gone from you. Now, had all this been noted down and measured, the system, though laborious and sometimes a drudgery, would have been the means of impressing it upon your mind, and your drawing would have been of greater use. Of course, many do this, and so great is the importance of such a course of study known to be by those qualified to judge, that the prizes for sketching old work are mainly based upon the principles I have enumerated. I believe a favourite maxim of the late Mr. William Burges was "Sketch and measure, measure and sketch," short and to the point, like most of the clever things he said. Some may think it unnecessary to call attention to what every student knows, but my own observation is that though students may know it, the system is not so universally practised; and that the neglect of this thorough way of sketching is the cause of a great deal of weak and senseless detail in modern building. Rushing through towns and cities making pretty sketches is a very charming amusement, but if it is to be of real architectural value to yourself and others, beyond the ephemeral pleasure of looking at pretty drawings, no other way is of use than the one touched upon. The rambling method will leave the student a travelled barnacle, with little real professional gain. The habit of thoughtfully working out one subject, and mastering it, is worth a bookful of "bits": it conduces to an increase of reasoning power by going to the root of the matter, which, when we are at work upon designs for our own buildings, gives method and reason for what is produced. It seems to me an absolute necessity in early years to pursue this system, as experience is gained, the student learns to discriminate and to jot down all the salient points of his study, and to economise labour upon it, but only after many years of toil and a peculiar faculty which some possess above others for grasping the essential, and showing only what is absolutely necessary to express this to yourself and others. Mr. E. W. Godwin's method of sketching old work may be quoted and pointed to as illustrating my meaning. Another useful way of making foreign travel of real use is the habit of keeping a concise and careful diary. It is, of course, rather irksome, but of the great advantage of so doing there can be little doubt; and when daylight gives over, and the student returns to his quarters of an evening, he would find plenty of occupation, and a pleasant way of passing what is often a very weary time. This occupation must greatly advance a student's general education; it teaches him to express his thoughts and ideas intelligibly, practising him in composition, and gives a habit of observation and a facility of expression which in after years will be of enormous advantage in writing reports for committees, papers to be read before such bodies as ours, and, may be, books to be published. Work to be done on the spot, whether sketching or writing, is conducive to habits of accuracy, and is of a value hardly possible to exaggerate.

Let us now consider "barnacles" in their nature of parasites, of which they are a species. The practice of architecture is not free from parasitical growth, and its progress is often impeded by it. In our day one great danger has arisen from the excessive prominence given to draughtsmanship and perspective drawing. The art of photo-lithography, whereby the actual handwork of the artist can be reproduced in fac-simile, has been an immense gain; its cheapness offers great advantages, and men have not been slow to seize them. The development of pen-and-ink drawings has largely fostered the production, and we have in our profession some exceedingly clever masters of the art. The professional journals have almost universally adopted photo-lithography for their illustrations. Most men like to see their works in print, and the facilities now offered for achieving this are so numerous, the demand so great, that it is not surprising that a large supply has followed. Now, valuable and useful as all this is, it is to be feared,—and you will remember that Professor Kerr warned us against the danger,—that young men, seeing the ease with which they can get their works thus copied, devote the greater part of their time to making pretty drawings, and obtaining excellence in the mechanical and artistic use of the pen, and this, it is to be feared, to the exclusion of more useful studies in the art and science of their profession. To be a good draughtsman is to possess a power which will stand the student in good stead, but if it tempts him to make pretty sketches and design elevations and details, which will not work, are not constructive, or are not the outcome of that primary necessity of all good architecture,—a well and carefully considered plan,—then such work is not true architecture, but a parasite. The study of such drawing is, of course, fascinating, and it is no wonder that the artist may in the pursuit of it, lose sight of the drier part of his work, which demands that he must give an intelligible reason for his design, and that it shall above all else be truthful. We are too apt, so critical have we become now-a-days in this matter of draughtsmanship, to lay too much stress upon the drawing and too little upon the design as a whole; and so important is this felt to be, that there has sprung up a class of specialists who undertake this class of work, and who can design elevations by the yard and make impossible perspectives, and if by chance we see works so represented carried into execution, we hardly recognise them. Useful, too, as perspective drawing is, the same tendency to exaggerate its use and to deceive is very noticeable.

One of the greatest encouragements to showy drawings has been the competition system, of which we have heard and do hear so much. The man who goes in to win a competition knows perfectly well that his chances of success generally lie in producing a fine set of drawings. It is not, therefore, much wonder that this should beget a race of draughtsmen-architects who know how to tickle the fancies of the Dog-

berries and their companions by designs for buildings which cannot possibly be executed for the money as designed, and which, if chosen, have to go through the mill and be ground down and thinned. The competition system, as too generally practised, has favoured the barnacle growth to an alarming extent, and the good ship Architecture has been much hindered in her course in consequence. Happily, much of this evil has been remedied, and it is, fortunately, becoming the custom to call in a professional assessor to advise committees. So much has been said on this subject, that I will not weary you now with any remarks upon it. Many of us are looking forward with some interest to see what the Council of the Royal Institute of British Architects are going to do in the matter of the memorial presented to them last year, followed by the report of the committee specially formed for the purpose of formulating a scheme for the better conduct of competitions. The matter is one of serious importance to the profession, and the barnacle cohesion given to the memorial was a proof of the interest taken in the matter, and how keenly men felt the injustice of the system as generally carried out. If the appointment of a professional assessor is the *sine quâ non* of all respectable architects consenting to join in a public competition, the death-blow will be given to the profession and calling of paper architects; these barnacles may be knocked off, and architecture, once relieved from this incubus, speed more easily on her way. No one in his senses is sanguine enough to suppose that the appointment of a professional assessor is the panacea for all the evils of the system, but fair play is a jewel, and every man who knows his work and loves uprightness will feel that in the hands of a man of honour and skill, his design will be judged, as far as fallible human nature can judge, on its fair merits.

Barnacles, you have observed, attach themselves to an object on the underside of it: are, in fact, out of sight, so that one does not notice them. If you will take the trouble to look you find them, or you may "nose them" if their habitation has become stranded high and dry. This habit of the barnacles brings me to another part of my subject to which they must render me their services as an illustration. Foundations, timbering, drainage, sanitary appliances, gas and water pipes, bell-wires, &c., are out of sight, often below the surface, and veritably it may be said of many an unsavoury smell, "You shall nose him as you go up the stairs into the lobby." Now we have heard so much about sanitation in all its branches, that I have not the slightest intention of entering into its mysteries; my only object in alluding to it now is to impress upon students the positive necessity of making themselves acquainted with the subject of sanitation. Immense progress has been made in this science of late years, but it is too much the fashion among enthusiastic young architects to ignore this branch of their work. Well, at first sight it is unsavoury, dull, and dry, and perhaps much of it is nasty. It is not a high art, but you must come down from the sky and lower the tilt of your æsthetic nose; the neglect of the study, and mastering of its rudiments at least, will beget a growth of barnacles, which will assuredly impede your progress to the shores of success. A few years back, and most men left all this seemingly unpleasant work to the builder or clerk of the works. Science, with her powerful "barnacles" on, has peeped into the hidden mysteries of health and impediments to health, has found out causes against which Medicine is powerless, and, looking deeper into causes, has discovered that they arise, almost invariably, from neglect of nature's laws, and that the seeds of disease and death are frequently to be found sown in the houses we live in. The note of alarm has been raised, daylight has flooded in upon the hidden horrors, and they have been revealed in all their bare hideousness. We know now that death is often taken into the home, and sewer gas,—that deadly upas-tree,—is responsible for more misery and disease than most of us have any idea of at all. I say we know this *now*, and it is simply criminal in any of us who are called upon to design buildings if we neglect the warning. Make yourselves masters of your art; but, neglect this, leave it to others to do in a kind of haphazard way, and you will most assuredly find that the opportunities of displaying your designing powers will be limited to paper and to your own offices. Nowadays most men are alive to this important subject. "Be sure you see to the drains," is over and over again the remark that you are met with by your clients. You will come across men thoroughly up in the principles of modern sanitation. You will, at the outset of a job, be asked what you advise; how you propose dealing with this problem, this or that soil, this or that system. If you answer, "My dear sir, you surely don't expect *me* to go into such matters; that matter is for the clerk of the works or the builder," then all I can say is, you will fall a great many degrees in the opinion of your clients; you will harm the profession to which you should be proud to belong; you will give cause for the remarks one so often has thrown in one's face, that architects are impracticable people, and do not know their work. This and much else has drifted from the profession, because we have hitherto too much neglected it, and a race of sanitary engineers has sprung up to do it instead. To ignore this class of work is so very foolish. Suppose a young architect, just established in practice. He must not expect to be building mansions all at once; he is called in for some small alterations, some revision of the drainage system is needed. If he can undertake this, and achieve success in it with careful thought and still more careful superintendence, he will win the confidence of his employer, and add to his chances of procuring more work. Now, supposing he adheres to the idea of the fine arts being the exclusive *rôle* of the architect, and that his soul is not to be worried by such "unconsidered trifles" as drains; the probabilities are he will disgust his employer, who will politely but firmly get rid of him on the first opportunity, and thus a chance of success, a step upon the ladder, has been lost, and with the ever-increasing number of aspirants for fame, you cannot afford to lose one single opportunity of winning your way. Clients are right in making us careful; the lives of those nearest and dearest to them may lie in our hands, and they will not be clean if, through carelessness and wilful neglect of what is now patent to any inquirer, we neglect the warning and go on blindly disregarding all the lessons of the past.

A paper treating of impediments to the progress of architecture would hardly be complete without some allusion to that great feature of modern times, speculative building. Here, barnacles of every kind and degree congregate, and, unchecked, hinder and impede all true progress. Naturalists tell us that the young barnacle is cyclopean, and makes use of his one eye to find a resting-place, and, pouncing down upon the first favourable one, there establishes himself. And then, quickly and with wondrous growth and fertility, shell houses gather all around him, until he has covered every available space with his progeny. Is not the speculative builder similar somewhat in his habits? His one idea is gain; he fixes his eye steadily upon some favourable spot, attaches himself to it with a firm grip, and then quickly covers the land with his creations, gathers to himself a whole host of other barnacles, until we no longer recognise the land he has covered. A parasite of the parasites is speculative building as too generally practised. It would be most unfair to gibbet thus all speculative builders. Some are men of high honour, to whom we owe a debt of gratitude. They are the pioneers of civilisation, who give fair money's worth; I only allude to the disreputable class of speculative builders who prey upon an ignorant public. They are not all to blame. Feeding upon them in their turn are the owners of the land they settle upon, who exact terms which are a premium upon dishonesty. Then, again, there are lawyers, and, it is to be feared, surveyors too, of a certain class, who fasten upon the unfortunate builders and suck them nearly dry; and, lastly, a greedy public, who grind them down to the lowest farthing. The blame is all round, I fear, and architects in their professional capacity can do little to remedy the evil. They are seldom consulted, beyond occasionally supplying plans, and except in the better class of speculative building, never in superintending the carrying out of them.

I must not try your patience any longer; doubtless other and better applications of the parable could be found. We might consider the barnacle as a species of goose or duck, and apply the *simile* without difficulty to much that is passing around us in the architectural world; for, verily, we see a great deal of goosedom, quacks, quackery, and quackdom, no end, to touch in detail upon which would carry us far into the night; but, like *Caliban* in the "Tempest," I must exclaim, "I will have none on't; we shall lose our time, and all be turn'd to barnacles." I am afraid that much that I have put down here is "bald, disjointed chat," but the paper has been written at odd times. In venturing to offer advice, and to point out what I consider the right road to success, I feel very much like a sign-post, but you will be generous enough to accord to me right motives, and to believe that under the fanciful title of "Barnacles" I have endeavoured to be of some service to you in raising the warning voice, and in inculcating truths which may stand you in good stead in the profession you have chosen. I know I have taken great liberties with my *simile*, employing it alike for men and things, but I trust you have been able to see my meaning, and that it will not be necessary to assist your mental vision with the use of "barnacles," which, Nuttall informs us, is an old name for a pair of spectacles.

We reserve our report of the discussion until next week.

FULHAM UNION INFIRMARY COMPETITION.

We have already mentioned that the Fulham Board of Guardians had had under their consideration the selection of a plan from among several which were submitted in competition for the proposed new infirmary, and had finally agreed to a motion to adopt the plan recommended by Mr. Currey, who has been assisting the Board with his professional advice on the subject. The drawings which have been submitted have been on view during part of the present week in a room in the Fulham Union Workhouse. Anything like a detailed examination and comparison of the plans, has, however, hardly been possible, owing to the small scale of the drawings, the height at which many of them are placed, and the very bad light in the recent state of the London atmosphere. We have only been able to give a glance at two or three of the sets which have been most prominently put forward in the discussion. Most of the competitors appear to have adopted the pavilion plan, with connecting corridors, which, in one shape or another, is now pretty well regarded as a *sine quâ non* in such cases. The distinctions between the various plans run therefore principally into matters of detail in the arrangement of the smaller accessory departments, such as entrances and business rooms, and the situation of the day-rooms in reference to the wards. The plan marked "Experience" in a circle (there is another also signed "Experience") is the one recommended for adoption, and which, from the report of the last meeting of the Board, we presume must be considered as adopted. The sick wards run nearly north and south out of the main corridor, with windows on the east and west sides, two beds between each window on each side, making thirty-two beds per ward, the number which it is understood was stipulated for. The bath-rooms and w.c.'s in connexion with each ward are reached by a passage across the end of the ward opening out of it, the bath-room opening from one end of this passage, and the w.c.'s from the other end. So far the plan is satisfactory, but some other parts of the arrangement are not so good. The day-rooms for each ward open from the other side of the passage opposite to the ward doors. We approve of isolating the day-room from the sick ward, but we consider it rather a clumsy arrangement to drive the main passage of the interior traffic of the building between them; it would have been better to have given the sick ward and the day-room a lobby common to both, which would have sufficiently broken the communication without crossing the main corridor. The day-rooms, which seem rather small, are planned in a good shape for getting the advantage of varied directions of sunlight, but the placing of the room for stores on one side of the small lobby entering on the day-room, and the water-closet immediately opposite, can hardly be called a good one; a small lobby does intervene between the water-closet and the entrance-lobby, but it is an unlighted and unventilated one as far as the plans show, and the author seems to have overlooked the fact that a lobby of discommunication in such a position is not of much value unless it can have a window opening to the external air. The reception-rooms for new patients would certainly have been more satisfactory if the necessary bath had been arranged in a small second room or recess,

instead of standing in the middle of the floor of the reception-room. In the main entrance arrangements the author seems to have been led away by the desire for symmetry of arrangement on paper which is often a stumbling-block in planning. Thus we find the matron's office on one side of the wide central entrance, and her sitting-room on the other side; the two should certainly have been *en suite*, for comfort and convenience. The porter's department is divided on each side of the outer entrance in a similar manner. Some of these details would be susceptible of rearrangement, which ought to be insisted on if this plan is actually carried out. Otherwise we do not find fault with the selection in the main. The elevations are neat and suitable for the purpose, and the effort seems to have been made to render them agreeable in appearance so far as a rigid attention to economy would admit of, and in this respect these drawings are about the most successful of the sets. Those marked "Simplicity," which have also received a premium, deal pretty fairly with the problem, but present nothing for special comment. The other set of plans marked "Experience" provide for the planning of the day-rooms partially *en suite* with the wards, in the way we have suggested above, but the light at one end of these rooms only is insufficient to make a cheerful room. The set marked "Hôtel Dieu" is better planned in regard to the accessories and entrances than any other we were able to examine, but the wards do not present the required accommodation as to number of beds, and the system of making the day-room practically a passage to the ward, which opens directly out of it, cannot be commended. There is, however, a good deal of ability shown in this set of plans, and the author has made a praiseworthy endeavour to give some little variety and character to the exterior of the building.

We understand that one or two sets of plans were thrown out in consequence of the employment of distinctive colouring in the floors and walls of the plans, contrary to the stipulation that no colour should be employed. We should be the last to suggest that the conditions of a competition should be treated with laxity, which always gives rise to unfairness towards those who have scrupulously observed them; but at the same time, we may point out, with a view to the regulation of future competitions, that it is a very unnecessary and illogical proceeding to word the conditions so as to disqualify a competitor on account of what is really a means of rendering plans more clear and intelligible. The idea, which is now frequently acted upon, of excluding coloured drawings from competitions, arose in the first instance from a desire to prevent competitors from attempting to impose on the committees or the judges by making effective and *ad captandum* views of the supposed effect of the building when completed, which might have the effect of drawing off the attention from the practical qualities of the plan by mere feats of picturesque draughtsmanship. But the distinction of different parts of a plan by different colours is quite another thing; it is only a simple practical way of making the grouping of a plan more immediately intelligible; it represents no picturesque effect, but is only a mechanical means of clearer delineation. The condition insisted on should be that no colour should be used on elevations and perspectives. It is absurd to disqualify a plan, if good in itself, merely because the author has shaded his walls in red or brown instead of in black. If the conditions have been so worded, no doubt they should be adhered to: that is the only safe rule of right in the case, but they ought not to be so worded, as it may result in disqualifying a competitor merely for having taken more than ordinary pains to render his plans clear to the eye, which is in itself a merit.

The Guardians deserve our applause for the manner in which they have conducted the competition. They called in a professional referee, and they accepted his decision.

Liverpool Engineering Society. — The usual fortnightly meeting, being the last of the session, was held on Wednesday evening last week, at the Royal Institution, Mr. A. Holt, M. Inst. C.E., president, in the chair. After the election of officers for the ensuing session and some other business, the retiring president in his address gave a paper on "The Proposed Elevated Railway along the Liverpool Docks."

JOTTINGS FROM GERMANY.

The Exchange in Berlin. — The *National Zeitung* calls attention to the building erected for the Exchange in Berlin, as being likely to perpetuate during many generations the fame of the late Herr Hitzig, the architect. The marble pillars of the interior, which serve as supports to the galleries, are described as being well in keeping with the magnificent columns and pilasters of the façade. The floor of the exchange-room was constructed, it appears, according to the plans of a subordinate; and it is noticed that in this particular the skill and taste shown in the other features of the central hall has been absent. The flooring being of wood, clouds of dust arise shortly after the business of the day has begun. The ventilation is said to be insufficient, and not of a nature to prevent the dust from being inhaled by those in the hall. The noxious effects of this arrangement are said to be well known. As some additions are now about to be made to the building, the journal we have quoted urges the laying down of tiles instead of the wooden flooring referred to.

Workmen's Schools.—The establishment of a technical school for workmen engaged in the iron trade, at Bochum, is approved by the German Press as being a step towards meeting a general want. The *Kölnische Zeitung* remarks that technical schools of a high class are abundant, while workmen have had but little opportunity (as far as the iron trade is concerned) of acquiring that description of knowledge required by foremen, &c., and which cannot be gained with any amount of practice in such a definite way as to enable a man to direct the carrying out with exactness of various metallurgical processes incident to the daily work of the craft. It is also remarked with justice that this class of instruction resembles the training which a well-tutored non-commissioned officer has received, and the fact that the German Government has of late years devoted particular attention to that branch of military organisation is adduced in proof of the necessity for the establishment in other iron districts of schools on the same plan as that of Bochum.

The institution in question has in a measure grown out of the local commercial school, and in its general plan is similar to the School of Mining in that town, the president of which, Dr. Schulz, has drawn up the programme of the new establishment, for which a director has apparently not yet been appointed. The mining industry allows of an arrangement by means of which students at the school can work in the pits for a part of the day, and thus support themselves during their period of study. This system does not prevail in the iron trade, and, consequently, provision has to be made for the maintenance of scholars attending the new establishment. To meet this charge the Government will, for twelve years, give a grant of 700*l.* per annum, the remainder of the cost being defrayed by the municipality.

There is to be a preparatory course lasting six months, after which the student takes up one of the sections of the advanced course, which lasts a year. The latter is divided into metallurgical and constructive branches. The former deals with the manufacture of iron, and the latter with machinery of all kinds, mechanical drawing, &c.

Monumental Architecture. — The monument lately erected at Munich by Professor Halbig for the Wagner family, is favourably noticed in the German press. From a foundation of syenite there rises on a simply-formed stand a bust of the deceased, in Carrara marble. A mourning female form (also in Carrara marble) leans towards the bust, around the base of which a garland of roses is thrown, the left hand of the figure being so arranged as to hold flowing drapery. A veil is thrown over the head, and droops over the neck. Opposite this figure, and completing the group, is a richly-adorned candelabra, standing on a light and gracefully-designed column, and with a burning flame symbolic of life. An imposing semicircular arch of syenite, with richly-gilt Byzantine ornamentation, forms the background. The whole is crowned by a beautifully-executed crucifix, in gilded bronze, in which the expression of the Saviour's countenance is described as being strikingly affecting.

A monumental fountain has been erected at Hanover, from the plans of Professor Hase, the figures having been designed by Professor Engelhard. The lower basin is 9 ft. 3 in. in diameter, from the middle of which rises an octagonal column, with projecting leaf capital, supporting a second basin of 4 ft. 6 in. diameter. A frieze surrounds the upper border of the latter, in which eight lions' heads serve as outlets for the water. The octagonal column here becomes quadrangular. The work is surmounted by two allegorical figures representing horticulture and fishing, above which rises a column, at the summit of which is a tabernacle, from which springs a flag-staff, with the arms of Hanover. The basement is of sandstone, and the rest of the work of bronze. The casting is by Gladenbeck, of Berlin, and the effect produced by the colour is as if the fountain had been standing for centuries in the position it now occupies, between the Marktkirche and the Rathhaus.

ART-STUDENTS' HOME.

On Wednesday, the 7th, the Baroness and Mr. Burdett Coutts entertained, at their house in Stratton-street, the young ladies who occupy the Art Students' Home in Brunswick-square, and invited many friends who are interested in art matters to meet them. The art-treasures of the house and some excellent conjuring after supper made the evening too short for the very happy guests. The Home in question, formed in two very good houses in Brunswick-square, was established by the Baroness Burdett Coutts for the purpose of providing students attending art-classes, &c., in London, the comforts and advantages of home and family life, under specified regulations, and the advice and presence of an experienced lady resident, and seems to answer its purpose admirably.

The Home contains, in addition to drawing and dining rooms, good rooms for study. The charge for board and residence inclusive, per term, is at the rate of 21*s.* a week, or for students occupying separate bed-rooms 30*s.* a week. In a few special cases selected by the committee, a reduction from these charges is made. Mrs. Malone is the Lady Resident, and Mr. Thos. Henry Wyatt, a name that will commend itself to many of our readers, is the hon. treasurer. The advantages of this Home have been so well appreciated by the students of Queen-square that it seems desirable that the advantages such homes afford should be extended to localities where other art or training schools exist,—notably in South Kensington. Only, in such a quarter, unless Government or the Commissioners assisted, it would probably be found impracticable to start them satisfactorily. It is to be hoped, however, an endeavour will be made.

STREET ARCHITECTURE IN SUNDERLAND.

The erection, by Mr. John Coates, cabinet-maker and upholsterer, Sunderland, of a handsome new warehouse at the corner of Fawcett-street and Borough-road, and immediately opposite the new Museum and Library, affords another illustration of the enterprise of local tradesmen. The new edifice, which is all but completed, is in the Classical style, modified to suit the character of other important buildings in the immediate vicinity. The material used is ashlar, from Alnwick quarries. The frontage measures 31 ft. in Fawcett-street and 86 ft. in Borough-road. The more prominent exterior features are that the ground-floor windows, of which in all there are nine, are separated by columns, each alternate one having carved or moulded caps. From these latter spring the heads of the windows, having panelled key-stones. Over the windows on the ground-floor runs a cornice separating them from the windows above, and from this cornice spring pilasters dividing the upper surfaces into bays. Both on the first and second floor each bay contains two round-headed windows, with keystones of the same character as those below. From the top of the pilasters and over the windows rises an elliptical arch. The exterior surface of the building is relieved from plainness by four bow-windows, two on either side of the building, supported on ornamental bases, and encircled with carved balusters. Above the elliptical arches of the higher windows runs the moulded cornice. A prominent feature in the structure is the square tower crowning the south-west corner. This tower has two circular windows on either side, and is surmounted by an ornamental finial. There are two entrances to the building, one being in Fawcett-street and the

other in Borough-road. In the interior the arrangements and facilities for carrying on an extensive business have been carefully studied. The dimensions of the shop on the ground-floor are 57 ft. 6 in. by 34 ft. A sliding wrought-iron partition, which is fireproof, separates the front shop from the finishing department in the rear.

The structure, which was commenced in May last, has been built under the supervision of and from plans drawn by Messrs. J. & T. Tillman, the contractors for the whole of the work being Messrs. Hirst.

Another new warehouse, which is all but completed, is that of Mr. Robert Farrow, oil and paint merchant. The site is in William-street, immediately off High-street, and the structure, which is three stories high, and built of brick, is of a plain but substantial character. The offices are entered from the front street, on the ground-floor, while the main warehouse extends to the back of William-street. The cellars, which are well lighted and ventilated, run beneath the whole area of the building. Above the offices, which extend the full width of the site in William-street, are three warerooms approached from the main warehouse. The latter is entered from the backs of William-street and High-street, where facilities will be afforded for taking wagons in a tramway, and thus loading from the ground-floor, which is so constructed as to be on a level with an ordinary wagon. A hoist for the purpose of loading and receiving goods will also be fitted at the end of the tramway, and this will be of sufficient size and weight-carrying capacity to convey goods of the greatest bulk or weight necessary in the several departments of the trade. The ground and first floors are constructed with rolled iron girders and concrete arched floors, supported on metal columns, every precaution having been taken to provide for the support of the heavy weights which will be placed upon the floors. The second-floor will be appropriated to the storage of the lighter class of goods. The several floors are approached by step-ladders leading from one story to another. All the doors from each floor of the warehouse, and also the main entrance, are protected by iron rolling shutters, the latter together with the hoist having been supplied by Messrs. Bunnett & Co., of Leeds. The building will be filled with all necessary oil-tanks, gantries, &c., to ensure the speedy and efficient despatch of business. The architect is Mr. W. Milburn, jun., of Fawcett-street, and the contractor Mr. T. P. Shaftoe, of Holmside.

THE FIRE AT THE RING THEATRE IN VIENNA.

This ill-fated theatre was quite a modern structure. It was only opened on the 17th of January, 1874, the first piece represented being Rossini's "Barber of Seville." It was built by a joint-stock company, and was intended for the performance of a class of operatic plays which, for various reasons, were unsuitable to the boards of the Grand Imperial Opera. The theatre accordingly bore the name of the Comic Opera. It was erected in the year 1873. The architect was Emil von Förster, a member of the Vienna Architectural Society. The cost was nearly 90,000*l*. It was built to accommodate 1,760 spectators. The parterre contained twenty-three boxes and 330 chairs. The first tier contained twenty-five boxes, the second twenty, while the third and fourth tiers consisted of galleries.

The edifice on the exterior exercised on the spectator a most charming effect. This was due to the rich decoration of the façade with pieces of sculpture, paintings, and gildings. The arrangement of the interior, however, by no means satisfied the requirements of such a house in regard to free access and free egress. The area upon which it was built was comparatively limited, being only 1,760 square mètres. Moreover, of this limited space the best use was not made, inasmuch as extensive refreshment-rooms and *foyers* were built on the first floor. Hence it was not possible to allot more than a limited amount of space to the passages and staircases. From the opening of the theatre complaints had been made by the public that the approaches to the pit and to the *parterre* boxes were through the first floor, and that it was only possible to reach those parts of the house by passing through a number of doors, through the wardrobe-room, and down a winding staircase. Owing to this complicated arrangement it was of constant occurrence that the spectators, on leaving the house after the performance, could not find their way out. It is not surprising, therefore, that many occupants of these portions of the theatre should have fallen victims to the late disastrous fire. But it was amongst the spectators in the third and fourth galleries that the principal sacrifice of life took place. No doubt if, when the gas went out, the oil-lamps which, according to the regulations issued since the catastrophe in the Nice Opera-house in March last, ought to have been burning on the staircases and passages had been lighted, many of the victims would have been saved, but the construction of the approaches to the uppermost parts of the house was radically defective, and it appears doubtful whether under such circumstances the loss of life could have been very materially diminished.

The architect contends that if the fire-blind had been lowered at the right time the loss of life would have been avoided. Unfortunately, however, the required steps never are taken on such occasions.

Mr. Alexander Aird, writing to us from Berlin, says,—"Mr. Fölsch, who is preparing a supplement to his work on 'Fires in Theatres' (reviewed by you April, 1878), tells me that the theatres totally destroyed by fire numbered,—

Between	1850	and 1860	 60
,,	1860	,, 1870	 100
,,	1870	,, 1880	 190

And that the terrible case of the Ring Theatre in Vienna is the *twenty-eighth* theatre totally destroyed by fire in the year 1881."

PLASTER.

The third of the series of Cantor lectures, at the Society of Arts, by Mr. Thomas Bolas, F.C.S. (which are on the "Industrial Uses of the Calcium Compounds"), was delivered on Monday, December 5th. After treating with sulphate of lime and its occurrence in Nature, the lecturer mentioned the various qualities and species of gypsum and alabaster, and proceeded to describe plaster of Paris, its preparation and uses. The fireproof concrete of Messrs. Dennett & Ingle, prepared from highly-calcined gypsum, was shown, and favourably commented upon.

The lecturer also passed round a sample of "Super-super" plaster, manufactured by Messrs. Bellman & Ivey, of Wigmore-street, and called attention to its extremely fine character. The application of plaster in the form of Scagliola marble, as manufactured by the same firm, was explained, and the specimens shown (in which the material was applied to columns, pilasters, wall-linings, and pedestals for statuary) were much admired on account of their high polish and admirable representation of the marbles.

After referring to some of the physical and chemical aspects of the setting of plaster, the lecturer mentioned the use of the material in moulding, stereotyping, and other processes.

REDDITCH AND HEADLESS CROSS DRAINAGE.

The drainage works of this district, for which tenders were invited in the *Builder* some time since, have just been completed under the Local Board.

The sewage from Redditch is conveyed by a system of brick and pipe sewers to precipitating-tanks outside the lower portion of the district, where the solid matter is precipitated and the effluent water passes over 4 acres of fitting ground. This ground is laid in terraces and drained, 25 ft. apart and 5 ft. deep; the filtered sewage-water passes off through these drains into the stream bounding the property. The tanks are placed at such a level that a large area of land in the valley below is commanded for broad irrigation purposes.

The sewage of Headless Cross is taken by a separate system to tanks at the extreme end of this part of the district and will be utilised by irrigation also. Flushing tanks are constructed at the ends of the sewers, fitted with Messrs. Bowes, Scott, & Read's Automatic Flushing Syphon for passing periodical flushes of water through the sewers.

The works have been carried out by Mr. G. Law, contractor, of Kidderminster, at a cost of 8,500*l*., which is within the engineers' estimate, and the works have been completed within the nine months allowed under the contract. Messrs. Gotto & Beesley, of Westminster, are the engineers, and the works have been superintended by Mr. Baylis, the Town Surveyor.

HOUSES AT WALMER, KENT, FOR MR. ALEXANDER TOD.

Walmer is a favourite select seaside place, possessing an unequalled sea view, overlooking the Downs, with their ever-varying panorama of shipping. Though its situation is unique and pleasing, its architecture has been devoid of interest. The houses which were not of wood could boast of but 9-in. walls, covered with cement. Private and lodging houses are much in demand, and Mr. Alexander Tod is now erecting several blocks of houses. Our illustration shows one of the blocks, which is an attempt to improve the existing state of things, and erect houses for the accommodation of visitors which, while picturesque, are well drained and ventilated.

In the house illustrated the lower story is of red bricks. The half-timber work is painted a cream-white, and produces a cheerful contrast with the panels, which are pebble-dashed. The pebbles for dashing have been collected from the sea-shore. The roofs are covered with red tiles. The sills and general dressings are of concrete, which has been cast on the spot.

Mr. Tod has not had any contract. Mr. Robert Redman, the clerk of the works, employed labour. Mr. William Webb acted as foreman of carpenters; Mr. G. Harvey, as foreman of plasterers; and Mr. Pulling, of painting, glazing, and decorative work. The facing bricks are of a dark red colour, made by Mr. C. Richardson, at Teynham.

Messrs. Frost Bros., of Deal, are doing the gas, water, and bell fittings. The baths and stoves are by Messrs. Steven Bros. and Messrs. T. Potter, of London. Mr. Finnis, of Dover, supplied the timber; and Messrs. White Bros., of London, the cement. The tiles are from the works of Messrs. S. & G. Collier, of Reading. The hip-and-valley tiles are purposely made, and work with the tile courses. The angle hanging-tiles are also purposely made to overlap the front angles of the dormers and gables, and thus prevent the wet driving in between the tile-hanging and the woodwork of the windows.

The houses are being erected from the designs and under the personal superintendence of Mr. James Neale, F.S.A., of London.

The eastern block is just completed, and the western block is roofed in and glazed. The central house was existing. It has been thoroughly recast.

BRIGHTON STREET ARCHITECTURE.

PREMISES CORNER OF WEST STREET AND THE KING'S ROAD.

This building is being erected for Mr. Alderman Nottage, of the City of London, and is situated at the south-east corner of West-street and the King's-road. It provides the following accommodation:—A sub-basement, 26 ft. below the footway, arranged for wine-stores; a basement, forming offices to the shops over; seven shops, with offices, and fifty-one rooms over for the purposes of a private hotel, the entrance to which is from the King's-road. There is also a good back entrance from South-street. There will be three hydraulic lifts,—one for passengers, one for luggage, and one for dinners, &c.

The kitchen and offices are on the topmost floor, fronting to South-street. There will be two wide stone staircases from the basement to the top floor.

The whole of the interior fittings, including windows, doors and their dressings, skirtings, and so forth, will be of oak, wax polished.

The rooms and staircases will be ventilated, and the staircases and passages warmed from the basement.

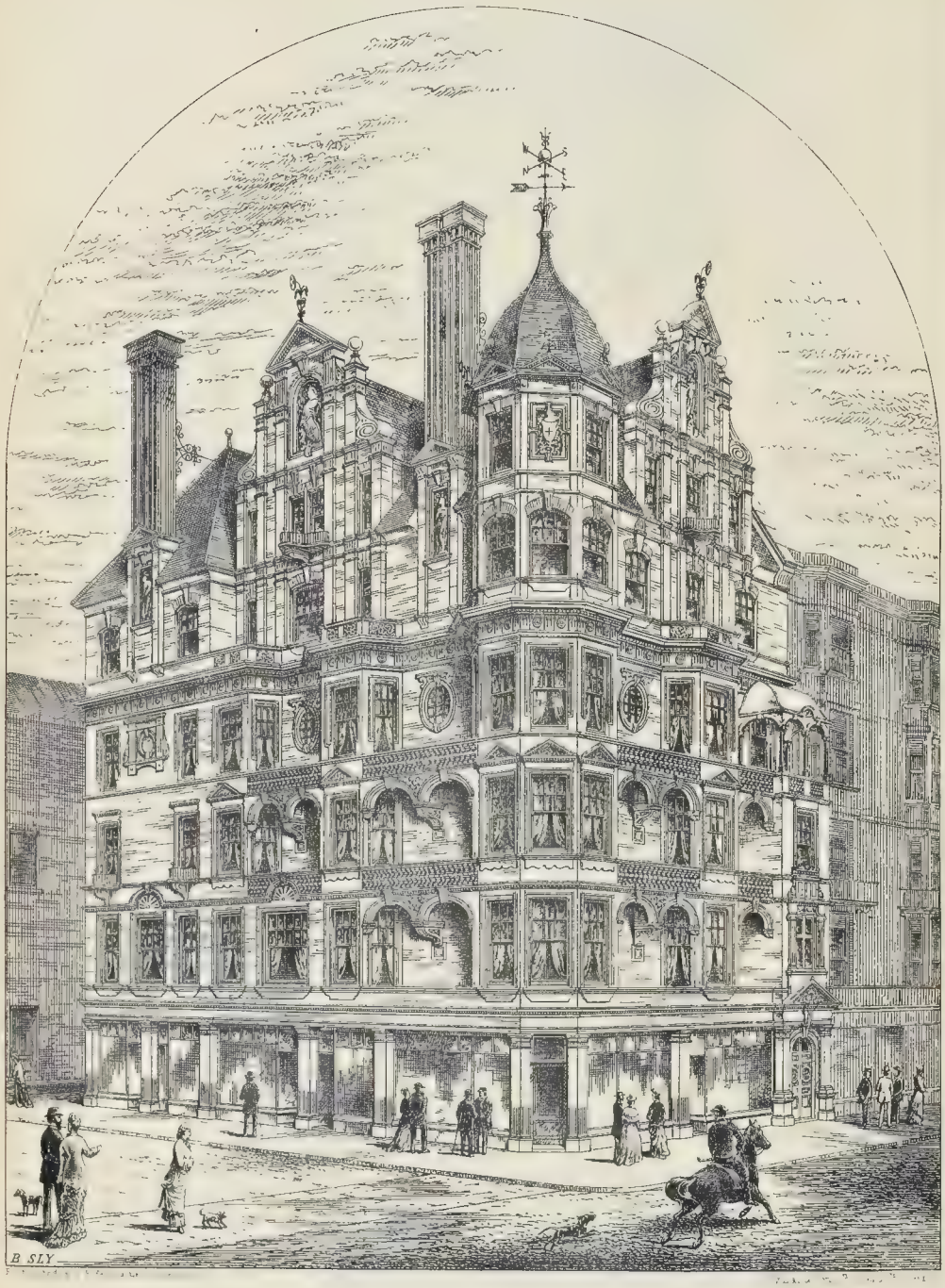
The exterior is in the Queen Anne style, the dressings and facings being of terra cotta, in two shades of red, manufactured by the Tamar Terra Cotta Company.

The total cost, inclusive of site, but exclusive of furniture and fittings, will be about 42,000*l*. Messrs. Lainson & Son are the architects.

The Council of the Royal School of Art Needle-work has, with the special approval of Her Royal Highness the Princess Louise, forwarded to the Art Furnishers' Alliance, 157, New Bond-street, a magnificent assortment of art needle-work for exhibition during the Christmas vacation.



CANNING COLLEGE, LUCKNOW.—Designed by Tika Ram, in the Office of the Engineer-in-Chief, Rajputana State Railway.



BRIGHTON STREET ARCHITECTURE: PREMISES AT THE CORNER OF WEST STREET AND THE KING'S ROAD.

Messrs. Lainson & Son, Architects.



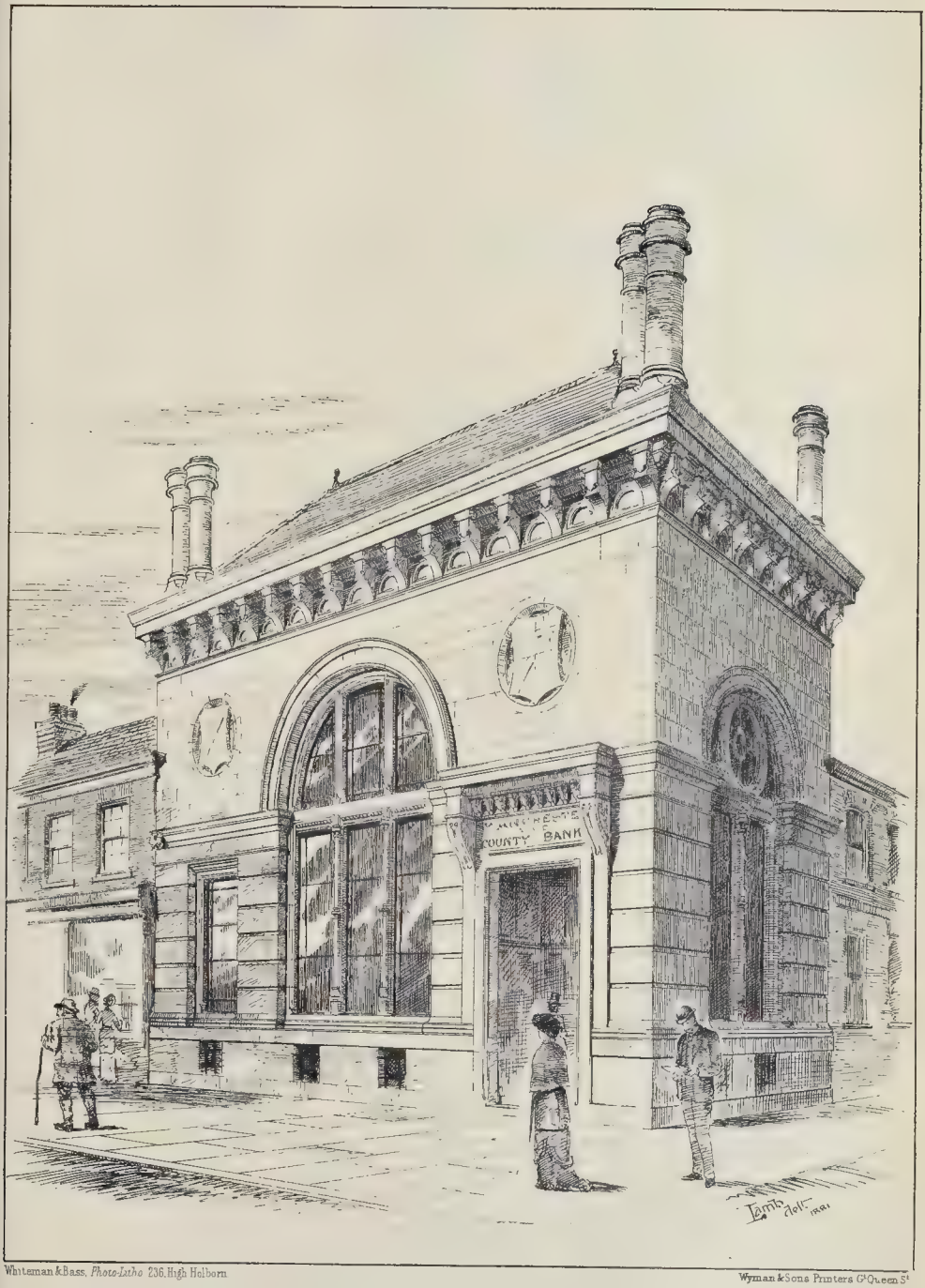




C.F. Kell Photo-Lith Castle St Holborn E.C.

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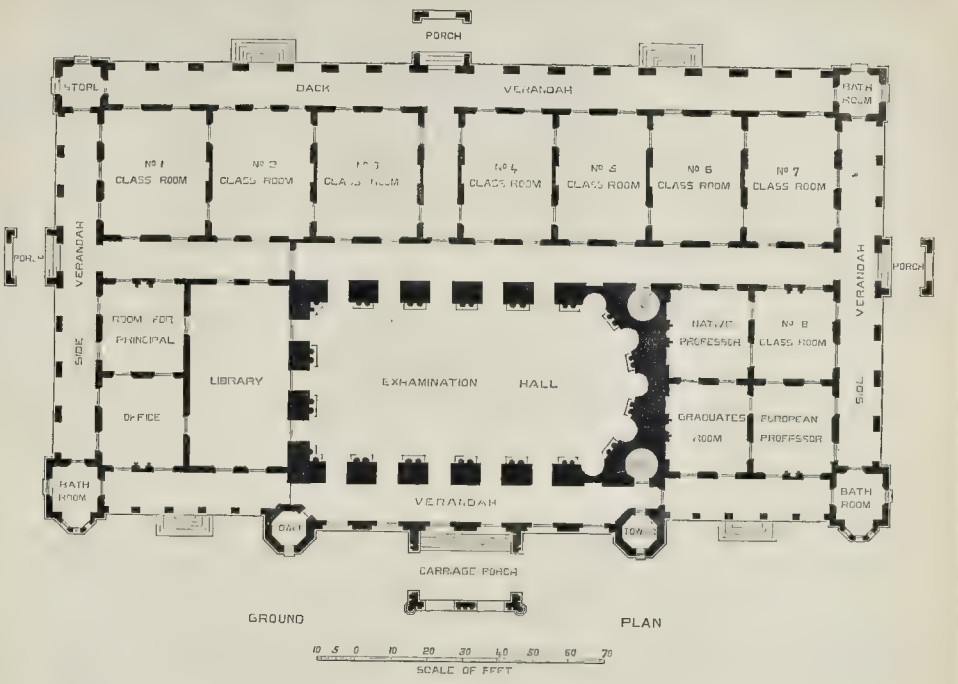
HOUSES AT WALMER, KENT.—Mr. James Neale, Architect.



Whiteman & Bass, *Photo-Litho* 236, High Holborn

Wyman & Sons Printers 6 Queen St

BANK AT BLACKPOOL, LANCASHIRE.—Messrs. Mills & Murgatroyd, Architects.



CANNING COLLEGE, LUCKNOW.—*Plan of Ground Floor.*

BANK AT BLACKPOOL, LANCASHIRE.

THESE premises are being erected for the purposes of a branch bank at the great Lancashire watering-place, for the Manchester and County Bank (Limited). As there is no residence attached, the architects, Messrs. Mills & Murgatroyd, of Manchester, have sought to gain effect by height and by breadth of treatment. The exterior is faced with Longridge stone; the plinth, window-string, and door-casing being of polished Bessbrook granite. The windows are of exceptional size, and will be glazed with polished plate-glass in ornamental metal frames set in the stonework. The interior will be finished, so far as the joinery is concerned, with pitch pine. A panelled wall lining of that material, with cornice will be carried round the walls for a height of 7 ft. 6 in., concealing the entrances to the strong room, cellar stairs, private office, &c.; the walls above that will be panelled in plaster, and the ceiling will also be in pitch pine worked up with a hexagonal shape, so as to conceal the want of rectangularity in the site. The basement will be occupied by clerks' lavatories, spare book-rooms, &c. The main frontage is 45 ft. long, and the height to the top of the main cornice, 36 ft. Messrs. Cooper & Tullis, of Preston, are the contractors for the whole of the work; the Albion Sawmill Company, of Fleetwood, executing the joiner's work for them.

CANNING COLLEGE, LUCKNOW.

THE paper read at the Royal Institute of British Architects last Monday, and the important discussion which followed, have made the buildings lately erected in India the subject of conversation during the week in many quarters. We take the opportunity to give a view and plan of one of them, completed not very long ago,—the Canning College, in Lucknow. This building, named in honour of the late Lord Canning, was built at the expense of the Talukdars of Oudh as a place of education for their sons and for the sons of other high-class natives.

The foundation-stone was laid on the 13th of November, 1867, by Sir John Lawrence, the then Governor-General; the usual coins, &c., were placed in the stone, which is situated under the floor of the tower on the west side of the front portico. The design first accepted in 1866 was subsequently rejected, and fresh designs were invited. The design ultimately accepted and carried out was prepared by Tika Ram, head draughtsman in the office of the Engineer-in-Chief, Rajputana State Railway. The main features of the design have been adhered to, but owing to the designer not having supplied detailed working drawings, and from other causes, many alterations have been made in the construction.

The accommodation provided consists of an examination-hall, 95 ft. by 45 ft. (the original length having been reduced by 5 ft. to allow of the east end wall being thickened to act as an efficient abutment to the elliptical portion of the arched roof), a library, 51 ft. 6 in. by 29 ft., and two rooms, 24 ft. 9 in. by 23 ft. 6 in., for the principal and office; on the east of the examination-hall there are two rooms, 22 ft. 6 in. by 24 ft. 9 in., for native professors and graduates, and two rooms, 23 ft. by 24 ft. 9 in., one for European professors, the other for a class-room; on the north side of the central corridor, there are seven class-rooms, two 29 ft. 4 in. by 35 ft. 6 in., one 29 ft. 1 in. by 35 ft. 6 in., and four 25 ft. 5½ in. by 35 ft. 6 in.; there are also two corner rooms, 11 ft. by 11 ft., and two 13 ft. by 13 ft., and two small octagonal rooms in the front towers. The work was completed in 1879.

The soil on which the building stands was found to consist of some 2 ft. of rubbish, the remains of the former old buildings, and below that of sand; the foundations throughout the building are carried down to a depth of 8 ft.; the lower 7 ft., consist of concrete composed of sixty-five parts of brick ballast, twenty-one parts of surkhi, and fourteen parts of kankar lime, the lime for this and the whole of the work being burned on the spot. The concrete, after being thoroughly mixed on the platform, was spread in 6-inch layers, and rammed with ordinary iron rammers till quite hard. The brickwork is set in English bond, in mortar composed of equal parts of fresh kanker lime and surkhi.

The plinth is 4 ft. 6 in. high, and inverts are given under the arches of the examination-hall to equalise the pressure on the foundations. On the top of the plinth a damp-course of asphalte, $\frac{3}{8}$ in. thick, was laid.

The superstructure, which, with the exceptions hereafter mentioned, is entirely of brickwork, was carried up evenly throughout the whole building, and kept thoroughly wet until completed.

The roofs of the upper and lower verandahs and corridors consist of segmental arches of 9 ft. span and 2 ft. 6 in. versine; the span of the arch is made less than the width of the verandah by bringing the arch forward on to the cornice; the arches are 9 in. thick, and the spandrels, up to the level of the extrados, are filled in with concrete composed as for foundations; the thrust of the arch is taken by wrought-iron bars, each 3 in. by $\frac{3}{8}$ in., tied together at 8 ft. intervals by bolts 1 in. in diameter.

The roofs of the library and all rooms except the examination-hall and turrets, are of brick arches, turned between girders; the arches are 4½ in. thick at the crown, and 9 in. at the haunches; the spandrels up to the level of the top of the girders are filled in with concrete composed as for foundations, and the whole of the outer roofs are covered with a layer of "terrace," having a good slope outwards; the finished thickness of terrace averages 4½ in., and is composed of four parts brick-ballast and coarse surkhi, and one of fresh lime; these materials were thoroughly mixed and spread on the roof to the required thickness, then beaten till quite hard; a layer of fine mortar mixed with gur was then given, and the whole surface finished off by being well rubbed over with castor-oil.

The girders for these roofs are entirely of wrought-iron, and were made on the spot. For the library and three largest class-rooms they are 2 ft. deep, with webs ¼ in. thick and flanges of double 4 in. by 4 in. by ¾ in. ⌊-irons; for other rooms they are 2 ft. deep, with webs ¼ in. thick, and flanges of double 3 in. by 3 in. by ¼ in. ⌊-irons; for small porches they are 15 in. deep, with ¼ in. webs, and flanges of double 2 in. by 2 in. by ¼ in. ⌊-irons; the girders are designed so that the load on them induces a strain on the flanges of

less than five tons per square inch of effective section: where necessary to withstand the thrust of end arches, as in porches, &c., bars were built into the walls and secured to the nearest girder by iron bolts. The girders, bolts, and all ironwork, received two coats of paint before being fixed in position.

The library roof in the original design was arched, and caused a very unsightly projection in the line of the front parapet. The alteration from a single arch to arches between girders, while improving the appearance of the front elevation, necessitated some provision for lighting in place of the end circular lights; this is given by a skylight, 21 ft. 9 in. by 6 ft., placed in the centre of the library roof. To take the thrust of the roof arches at the ends of the space left for skylight, strut girders are given between the four centre main girders, with webs ½ in. thick and flanges on one side only of 4 in. by 4 in. by ⅜ in. L-iron; these are riveted to main girders by L-irons 3½ in. by 3½ in. by ⅜ in. Round the top of the rectangular space thus formed and bolted to the top flanges of girders is a sill of sal-wood, 8 in. by 4 in., into which the uprights of skylight are fixed; the sides and ends of skylight have glazed sashes working on pivots. The roof, which is curved, is covered with 1 in. planks tongued and grooved, and painted with three coats of oil-paint, and over this corrugated iron carried well out over ends and sides. The inside of skylight and wells formed by main and strut girders are painted a dead white, and a very good light has been secured.

The roof of the examination-hall has been made elliptical throughout, the span of plain portion being 45 ft. and of ribs 43 ft. 6 in.; these latter are disposed in pairs immediately over Corinthian pilasters. The east end of the roof, which is elliptical in plan, is domed to meet the straight portion. The whole of the arching springs at a height of 31 ft. 6 in. above floor-level, and has a versine of 15 ft. The thickness of plain portions of roof is 1 ft. 2½ in. at crown, increased to 1 ft. 10½ in. at haunches; where the ribs occur these dimensions are increased by 9 in.

The arch was built on a Hindustani centre, supported by pillars of brick-in-mud, placed about 8 ft. apart; the exterior of centre was worked roughly to shape and finished with lime-mortar, the true shape being obtained by use of templets made for the purpose; the arch was built in lengths of 15 ft., so that each joint comes between a pair of ribs. The whole roof was built and keyed in fifteen days. There was some little delay in getting the backing up to the required height, and the centreing was not wholly struck until some time after. Levels taken at 10 ft. intervals along the top of arch just after keying up and after centres were wholly struck, showed the maximum settlement to be 0·1 ft. and minimum 0·05 ft., the mean being $\frac{1}{16}$ in. In the straight portion of the roof the thrust is taken by 4 in. by 4 in. by ⅜ in. L-irons, placed 6 ft. above springing and connected by tie-rods 1¼ in. diameter, placed 7 ft. 6 in. apart. The spandrels are filled with concrete as for foundations, and a 3 in. layer of terrace is given over the whole.

The floors throughout the building are of Mirzapore stone slabs, set in 2 in. of lime-mortar over brick rubbish carefully rammed.

The central rectangular and corner turrets have Mirzapore stone pillars and lintels; the arches between the pillars are cut in 4 in. stones, which are let 2 in. into both pillars and lintels; the joints are set in fine lime-mortar, and the lintel stones are held firmly together by iron cramps run in with sulphur; the pillar-bases and caps are secured by vertical iron dowels, also run in with sulphur. The roofs and work above lintels is entirely of first-class brickwork; in rectangular turret the roof is a semicircular arch, 1 ft. 2 in. thick, and the corner turrets are domed thrust-bands of 4 in. by ⅜ in. iron, being built in at a height of 2 ft. 6 in. above springing; round these corner turrets there are projecting balconies supported on stone brackets 2 in. thick; these brackets project 4 ft., and are built 2 ft. into the wall. There is no weight on the portion built in except the stone flagging, so, to prevent any chance of tilting, an iron rod, ¾ in. diameter, was passed through them all at the centre of their depth, and at a distance of 1 ft. 6 in. in from the face of the wall: this rod is embedded in brickwork, which comes up flush with the tops of the brackets.

The two small turrets in front and the four minarets are entirely in brickwork.

The projecting windows in the front corner towers are carried by brick corbels, and a capping sill of stone, 6 in. thick cut, to the shape of the window on the outside and carried through, so as to be flush with inside face of wall.

The whole building inside and out, except the interior of the examination-hall, is plastered with a thin coat of sand plaster, composed of one part stone lime, one part kankar lime, and two parts clean Goomtee sand, ground together in a mortar-mill and laid on in the usual manner. All mouldings and ornamental work were executed in brickwork as closely as possible to the finished shape, so as to reduce the thickness of plaster to a minimum.

The exterior of the building and interior of end and back verandahs and porches are left of natural colour of the plaster, the ornamental work having a ground of pale neutral tint; the class and other rooms except examination-hall, are coloured light blue, the roofs and cornices being white; the central corridor, lower front verandah, and both upper verandahs are entirely white, so as to throw as much light as possible into the examination-hall, which receives its light through them.

The examination-hall is plastered throughout with white plaster polished to imitate marble; the rough coat is composed of equal parts of surkhi and fresh kankar lime, this is covered with a thin coat composed of white lime and powdered Jubbulpore soap-stone worked in and rubbed up to a fine polish.

The upper verandahs are reached by two spiral staircases formed in the east end wall of examination-hall; they are 9 ft. in diameter, with a newel 1 ft. 6 in. in diameter, giving a clear width of step of 3 ft. 9 in. The centre width of tread is 1 ft. 2½ in., and rise 8 in. The steps and risers are of Mirzapore stone, the former 4 in. thick with a moulded nosing, the latter 2 in.; the south staircase is continued up to the roof of the examination-hall, its outlet being covered by an arched roof, which is carried up spirally from a point 1 ft. 6 in. below roof level, the staircase door opens on to the roof behind the turret on the east side of front portico, which hides it from the front, while it is hidden from the east by the parapet which at this point is 4 ft. 6 in. high.

The doors and windows throughout the building are of teak, fixed in teak chowkuts; these latter are not built into the walls, but fitted accurately to the openings in the brickwork and secured by screws to dovetailed bricks of sal wood, which were, after being soaked in tar, built into the walls. In addition to the glazed or panel doors, all outer doorways are fitted with teak Venetians.

The arches in room over front porch, and also the front doors of upper front verandah, are fitted with ornamental cast-iron railings with teak top and bottom rails.

Ventilation is provided in examination-hall by holes left at the soffit of the arch between each pair of ribs; it is provided in a similar manner for the long verandahs and corridors, and in rooms by openings in the ends of roof arches, which are carried up the end walls. All openings are covered by suitable caps to prevent the entrance of rain.

Polished brass finials are given to turrets, minarets, and the projecting windows of corner towers.

There is no woodwork in the whole building except the doors, chowkuts, and library skylight.

The general effect of the exterior must be regarded as very poor. The style, as the designer stated, is in harmony with the surrounding buildings of the Kaiser Bagh, — a bad standard.

The total cost of the building was Rs. 1,73,299, or Rs. 5 per square foot of plinth area. It was almost exactly two years in construction.

THE ST. GOTHARD TUNNEL.

It is stated in the foreign press that the service of trains through the Gothard Tunnel, commencing on the 1st of January, will include three daily communications from the Swiss to the Italian side. Two of these will be in connexion with through-trains from Lucerne to Milan. The saving of time will, according to present arrangements, be about four or five hours, as compared with the mountain route hitherto traversed, the journey from Lucerne to Milan being arranged to take about twenty-two hours.

SANITARY AND DOMESTIC EXHIBITION AT BRIGHTON.

On Monday afternoon last the "Domestic and Scientific Exhibition," in connexion with the Health Congress which has been held at Brighton during the present week, was formally opened by the Right Hon. the Earl of Chichester, Lord-Lieutenant of the county of Sussex, who presided over a large and influential meeting held under the dome of the Royal Pavilion.

The Earl of Chichester said that while he was very glad to see the great interest which was being most deservedly taken in all matters that concerned the health of towns and cities, he was afraid that some persons who lived in towns thought that a country gentleman's house smelt of nothing but violets and wallflowers. He was sorry to say that, in his experience, he had found many country mansions and parsonage-houses pervaded by as foul odours as any that existed in the courts and alleys of some towns, and supplied very often with worse water than was procurable in towns. It was satisfactory to note that great progress had been made during recent years in all that concerned the adoption of securities for health. Since the time when all England was on its knees praying for the recovery of the Prince of Wales, the sanitary condition of dwellings had been more closely looked into, and a great many discoveries of latent sources of disease had been made, and very much had been done in providing for the better sewerage and water-supply of towns. He did not think that the inhabitants of Brighton had anything to complain of with regard to their water-supply, and the authorities had made a very magnificent main sewer, which he trusted would be so managed as to be no nuisance to the inhabitants. In ancient Rome there was a goddess who presided over drains, and if the mayor could only persuade some fair lady to preside over the *cloaca maxima* of Brighton, so as to secure the inhabitants against any unpleasant exhalations from it, he would immortalise his name. He trusted that the exhibition which they had met to open, exemplifying as it did the application of scientific principles to the preservation of health, would be of great benefit not only to the town, but to the nation at large.

The Mayor of Brighton (Mr. W. H. Hallett), having explained in detail the circumstances which had led to the proposal for holding a health congress in the town, supplemented by an exhibition of sanitary and domestic appliances, said that he thought the health congress would be one of the most successful gatherings of the kind ever held, for up to that time,— which was some thirty hours before the congress would commence, — 773 persons had taken tickets. The merit of originating the exhibition, which he thought would be pronounced by everybody who saw it to be a very good one, was due to Councillor Hamilton, who had been indefatigable in its organisation.

The Right Hon. the Speaker said that perhaps he might be allowed to tender himself as a witness to the fact that one of the best prescriptions for health was hard work. The age in which we lived had been very properly called the age of great cities. London was a gigantic city, having a population which was increasing in a most prodigious manner, as, indeed, might be said of the population of the country at large, the increase being at the rate of about a thousand souls per day. That increase was mainly in the great cities and towns, and it therefore behoved the authorities of the great cities and towns to see that the health of the population was maintained, because if it were not maintained the people would degenerate in stamina and become dwarfed both in body and mind. He was very glad to think that Brighton was setting a good example to other towns, but although much had been done to maintain the health of Brighton, much more remained to be done. He was old enough to remember Brighton when it was very little more than a large village; now it was an immense town. As it grew in numbers and extent evils came upon it which should be promptly dealt with. He observed very frequently hanging over the town a smoke-cloud. That was likely to become a very serious matter for the people of Brighton to deal with, and he should be glad to think that one result of the conference and exhibition would be that it should lead them to grapple with the smoke nuisance. The larger the town became, the worse would be the nuisance, which in London was becoming intolerable. There was another

matter which he might be permitted to advert to. In all large towns and cities open spaces for the circulation of air and for the enjoyment of the citizens were very essential. He had heard a whisper about a park for Brighton. He did not know what the authorities of the town proposed to do with regard to the proposal, but he trusted that the congress would give the subject a lift.

Mr. Hollond, M.P., having made a few remarks, the Earl of Chichester, accompanied by the Bishop of Chichester, the Mayor of Brighton, Dr. Richardson, Mr. Hollond, Sir Henry Cole, Mr. Edwin Chadwick, Mr. Hamilton, and other gentlemen who occupied the platform, followed by the remainder of the large audience, adjourned to the Exhibition, which is a very large and good one, occupying, not only the Corn Exchange, but an extensive range of corrugated iron buildings in the Pavilion grounds. These temporary buildings have been erected by Mr. J. Charlton Humphreys, of the Ludgate Station Roofing Works, New Bridge-street, in rather less than three weeks. This, from the extent and position of the buildings, is certainly a feat in construction. In order not to interfere with the Pavilion grounds, which have a very undulating surface, the buildings are carried on wooden sleeper walls extending to a height of from 6 in. to between 5 ft. and 6 ft. above the surface of the ground. The two main buildings (which are connected together and with the Corn Exchange by two or three smaller structures) measure, the one 200 ft. in length by 40 ft. in width by 25 ft. in height to apex of roof trusses (which are of timber), and the other 280 ft. in length by 32 ft. in width, by 14 ft. to the apex. Longitudinal sleepers 9 in. by 4 in. carry the joists, 7 in. by 2½ in., the flooring being of 8 in. by 2 in. planks.* The buildings are illuminated by the electric light, two systems being employed, viz., the "Brush" and the British Electric Light Company's system, the engines and dynamo-electric machines being located in one of the temporary iron buildings, which also include a small hospital room, in which beds and other appliances used in hospital wards are shown by some five or six London hospitals.

The Exhibition is divided into eight classes, including Food Products, Labour-saving and Educational Appliances, House Sanitation, Electricity as applied to lighting and other purposes, Decorative Art, Horological and Meteorological Instruments, and a loan collection of works of art from South Kensington. In Classes III. and IV., House Sanitation (including ventilating and heating, drainage, baths, water and other closets and fittings, filters, and plans and models of cottages and industrial dwellings), there is a very good display of useful appliances, including a few novelties; while in Class VI., Decorative Art, are several exhibits well worthy of attention. The catalogue is very imperfect in some respects, and as the classification adopted is not strictly adhered to, we propose to notice such of the exhibits as are of more especial interest to our readers in the order in which the stands are numbered, beginning in the Corn Exchange with Stand 34, where Messrs. Hannington & Sons, of Brighton, exhibit a well-made suite of drawing-room furniture, including chimney-piece, made of rosewood, and in the style of Louis Seize. At Stand 35, Mr. Russell R. Perry, of Brighton, has a very good display of muralis, raised flock, and imitation stamped leather, velvet, and silk wall-papers, most of the latter very rich in effect, and of French design and manufacture. They are also exhibitors of parquetry for floors and dados. Messrs. Sendall & Son, of Brighton (Stand 36), exhibit a number of specimens of painted imitations of woods and marbles. These include some of the best work of the kind we have ever seen. Messrs. W. Woollams & Co., of London, are exhibitors at Stand 37 of artistic wall-papers and dado decorations in great variety, all characterised by excellence of design and free from arsenical compounds. At Stand 68, Mr. H. J. Lanchester, architect, exhibits drawings showing the application of his patent waterproof facing bricks for use in exposed situations. They are stated to have been largely used in buildings on the South Coast, and to be made of the same material (terra-cotta) as used at the new Natural History Museum, South Kensington. Stands 69, 72, 74, 75, 76, 77, and 81 are devoted to architectural drawings, exhibited respectively by Messrs. Scott & Hyde, Mr. J. G. Gibbins, Messrs. Holford, Clayton, & Black, Mr. J. Pitt Bayly, Mr. Thomas W. Cutler, Mr. Somers Clarke, jun., and Mr. Rowland Plumbe. The domestic interiors shown by Mr. Cutler and Mr. Plumbe are very pleasing. Mr. Cutler also shows a set of drawings of the Princess Alice Memorial Cottage Hospital proposed to be erected at Eastbourne. Messrs. Lainson & Son exhibit drawings of the Royal Alexandra Hospital for Sick Children, Brighton. Stand 105 is that of Mr. George Alfred Rogers, of Maddox-street, Oxford-street, who displays some excellent specimens of wood carving. At Stand 107, Messrs. J. Rooke & Sons, of Brighton, exhibit a sculptured memorial cross in Sicilian marble, and some terra-cotta panels and capitals. Stand 108 is occupied by Messrs. Doulton & Co., who make a good display of Lambeth art pottery, in its varieties known as Doulton Ware, Lambeth Faïence, Impasto, Silicon, &c. They also exhibit some specimens of tile decorations. Stand 116 is that of the Albissima Paint Company, of whose sanitary paint we have on a former occasion spoken in terms of commendation. At Stand 117, Messrs. C. Feldwicke & Sons, of Brighton, are exhibitors of Chippendale and other furniture. Stand 124 is occupied by Messrs. Howard & Son, of Berners-street, with their parquet flooring. At Stand 133a the Mayor of Brighton (Mr. W. H. Hallett) is stated by the catalogue to exhibit "an effective and inexpensive apparatus for the softening of water from chalk, for domestic use," but we did not see it in the exhibition. At Stand 134, Mr. W. Botting is an exhibitor of a wash-out closet, and Dr. Churchill's "self-ventilating 'Disjuncta' closet." The North of England School Furnishing Company, Darlington, show Dr. Roth's adjustable seats and desks for school purposes, and, among other useful and convenient appliances, the "Kensington Art Table," very handy for drawing. Mr. Christopher Hill, Brighton (Stand 164), shows his patent arch fire-bars as applied to steam boiler-furnaces, and a kitchener with a set of patent inclined fire-bars. Messrs. Thomas Bradford & Co. (Stand 167) are exhibitors of washing-machines and other laundry appliances and fittings, and they also exhibit plans of large laundries fitted up by them. At Stand 171, Messrs. Barford & Perkins, of Peterborough, exhibit their steam-cooking apparatus, as used at workhouses and other large institutions. Messrs. Frederick Edwards & Son, of Great Marlborough-street, London, show, at Stand 172, their smoke-consuming slow-combustion grates, and a kitchener. Gas stoves and fittings are shown in great abundance by, among other firms, Messrs. W. Sugg & Co. (Stand 175), who exhibit some well-designed brass chandeliers and brackets in the "Queen Anne" and other modes. At Stand 177, Messrs. Doulton & Co. show their radiating tile slow-combustion warm-air stoves, and they have on view a good assortment of architectural and sanitary pottery. Among the latter class of goods we may direct attention to their new patent joint for stoneware drain-pipes. This joint is not on the spigot and socket principle. Each length of pipe is alike at both ends, which are ground quite smooth and true by machinery, and butt against each other when laid. About 1 in. from each end of each pipe a collar or fillet is moulded on the exterior of the pipe, so that when the ground edges of the ends of the pipes are brought together a space or hollow of about 2 in. in width by 1 in. in depth is left between the collar of one pipe and that of the pipe next to it, the ground butt-joint being in the middle of this space. The pipes are laid with the ground surfaces well together in stoneware chairs made for the purpose, in which they are keyed or wedged up, and the hollows of the chairs filled up with liquid Portland cement, the space on the upper half of the pipes between the collars or fillets being also filled in with cement. It is claimed that this method of laying stoneware drain-pipes secures an absolutely watertight and immovable joint. This firm also exhibit their automatic flushing-tank, their patent tank filter, and Mr. Bailey-Denton's aërating water-filter, besides lavatories, water-closets, and sanitary fittings of all kinds. Visitors to Messrs. Doulton's stand should look at Cutler & Chapman's patent syphon-action water-waste-preventing cistern, in which the syphon is set in action by the pneumatic action of bellows placed beneath the seat of the closet, and connected with the handle or pull. Messrs. C. G. Reed & Son, of Brighton (Stand 183), show stoves and grates of all kinds, including the "Wharncliffe" and slow-combustion stoves of Messrs. Steel & Garland, for whom Messrs. Reed are agents. At Stand 184, Mr. J. H. Gardner, of West Brighton, has a large display of chimney-pieces, stoves, grates, kitcheners, sanitary pottery, brick and tile goods, and other materials constituting the stock-in-trade of a builders' general merchant. Mr. Uriah Clark, of Hellingly, Sussex, shows at Stand 185, a variety of fancy ridge tiles and finials, besides terra-cotta and stoneware goods. Messrs. Henry Sharp, Jones & Co., of Poole, Dorset, exhibit (Stand 186), their rock-concrete tubes of large size for the construction of main sewers, and they show that these pipes are capable of being cut into for the purpose of connecting house-drains with them. Among the stoneware goods shown by this firm we may name their double-trapped and other gullies, and their soil-pipe disconnector. At Stand 187, Messrs. R. & N. Norman, of Burgess Hill, Sussex, are exhibitors of red facing and moulded bricks, paving bricks, tiles, cresting, and other goods of the kind. Messrs. Hayward Bros. & Eckstein, of Union-street, Borough (Stand 188), exhibit their patent semi-prismatic pavement and floor-lights and safety coal-hole plates. At the next Stand, 189, Messrs. Charles Drake & Co. (Limited), of Battersea, exhibit some very good things in their marble-concrete, including a bath, some steps and pavement, and a chimney-piece. Messrs. Sherwood & Streeter, of Brighton (Stand 190), exhibit the Antiseptic Company's simple appliance for deodorising pan and other closets. At Stand 192 Mr. T. H. Tuxford, of Brighton, exhibits ⊐-traps of improved form, and a wash-out closet-basin and trap combined, in one piece of earthenware, with outlet at the front. Messrs. Hodges, Butler, & Dale, of East Greenwich (Stand 194) show their "Imperial" silicated stone in some of its varied applications; for instance, they show sinks, baths, egg-shaped and cylindrical pipes of large dimensions for sewers, and paving, all made of this useful material. At Stand 196 Mr. Alfred Bedborough, architect, London, shows the patent "Imperial" sash-window. By lowering the top sash of the window a free vertical current of air is introduced into the apartment between the glass of the top and bottom sashes. This is effected by the frame and sashes being made so much higher than the window opening. Thus, the head of the frame will be 12 in. (more or less as desired) above the soffit of the window opening. The top sash is, therefore, constructed in height (say) 12 in. longer than the bottom sash. The sashes, though constructed as ordinary sliding-sashes, are capable of being opened on centres and inclined to any required angle so as to be cleaned from the inside. Messrs. John Bazley White & Bros., of London, exhibit (Stand 197) samples of Portland cement. The Eureka Concrete Company, of Leeds (Stand 198), show culverts, lintels, steps, sinks, and fireproof flooring made of their material. Dr. P. Hinckes Bird, of London (Stand 200), shows three models of his unpatented costless method of ventilation, the details of which we published in the *Builder* some years ago. Dr. Hinckes Bird's method of securing draughtless ventilation with the use of common window-sashes is worthy of the attention of visitors to the exhibition, as it is exceedingly simple and can be adopted by anybody. At Stand 204, Messrs. S. & E. Ransome & Co., of London, exhibit their patent solutions for the prevention of damp walls, and for preventing the decay of stone. The Water Reform Company (Limited), of London, show (Stand 205) Atkins's patent rotary filter (described by us some time ago), together with drawings illustrating their process for the softening and purification of water. The Ladies' Sanitary Association, of 22, Berners-street, Oxford-street, display at Stand 206 a number of their useful little sanitary tracts and publications. At Stand 214, Messrs. C. Kite & Co. exhibit their patent "Albert" chimney-caps and their exhaust ventilators for cow-houses, stables, &c., which have been extensively used in London. At Stand 217 Messrs. Banner Bros. & Co., of London, exhibit drawings and models fully illustrating their system of sanitation, the merits of which are so well known to our readers that we need only mention it. Messrs. Robert Boyle & Son, of London and Glasgow (Stand 219), show their well-known air-pump ventilators in various forms and sizes, from those of the small cowl to those of the large *flèche* or turret of architectural character. At Stand 225, Messrs. Hay-

* As announced in our advertising columns, these buildings are to be sold by Messrs. Horne & Eversfield at the close of the exhibition.

ward Tyler & Co., of London, show their new patent "full-flush valveless closet," of which we have spoken well on a previous occasion. Stand 226 is occupied by Messrs. Thos. Waller & Co., of Fish-street-hill and Southwark, who show hydraulic and other dinner-lifts; grilling and other cooking apparatus; a 9 ft. 6 in. cooking-range, with three boilers and two ovens, all heated by one small fire; a very useful steam-chest, and other appliances needed in the kitchens of large hotels, club-houses, &c. A welded iron boiler shown at this stand is a *tour de force* in its way. Messrs. Waller's patent ventilated water-closet should be looked at. At Stand 230 Mr. F. G. Underhay exhibits valve-closets and water-fittings in variety, and of excellent manufacture. His registered lavatory basin-valve is simple and good, and discharges very quickly. Another good thing shown at this stand is Law & Underhay's patent double-cylinder water-meter. It consists of two pistons working in two cylinders, which pistons give motion to two cranks fixed at right angles to each other at opposite extremities of the same shaft. The fluid to be measured is admitted successively to the upper and lower extremities of the cylinders by a rotary valve upon the crank shaft. The pressure of the fluid gives motion to the piston, causing the crank shaft to revolve continuously in one direction, and the quantity of fluid which passes is registered by a counting apparatus, which exhibits the number of revolutions made by the crank shaft, each revolution discharging a quantity of water equal to four times the contents of the cylinder. The meter is, in fact, constructed on the principle of a double-acting steam-engine, and is capable of being used as a motor. At Stand 232, Mr. George Jennings, of Stangate, has some interesting exhibits, including a new system of speaking-tubes, in which a branch tube from any room in a house can be led into a main or trunk tube (just as gas-pipes can be carried up and branched off anywhere), and made to "speak" in any other room, an ingenious arrangement of valves worked by electricity rendering it possible to shut off all other portions of the system of tubing from the portion through which it is desired to speak. Mr. Jennings shows water-closets and fittings, and his tip-up lavatories,—the latter greatly improved by the use of trunnions, which allow of the basin being instantly removed for the purpose of cleansing the space beneath it. Mr. Jennings also exhibits a new quick-filling water-waste-preventing cistern. At Stand 236, Mr. D. T. Bostel, of Brighton, shows his "Excelsior" wash-out closet, and, among many other things, Holt's patent automatic flushing-cisterns, which should be looked at by visitors. At Stand 242, Messrs. Meakin & Co., of Baker-street, show their sash-fasteners and openers. Among other exhibitors are the Improved Industrial Dwellings Company and the Artisans', Labourers', and General Dwellings Company, who exhibit plans of some of their buildings erected in London. It is stated that the number of dwellings erected by the first-named company is 4,135, accommodating about 20,000 inhabitants, at an expenditure, to date, of 745,000*l.*

The exhibition, as at present arranged, will remain open until Wednesday next, the 21st.

THE SEED-TIME OF HEALTH.*

In the depths of the night, in a climate where night is short; in the midst of that short interval, when even the gods are supposed to rest; when the sun-god himself has withdrawn from the earth, and the sun sees not the deeds of men, some men and women of the earth, in solemn silence, bring something forth from home. If they should speak, there would flow from the lips of those people a language so beautiful, so perfect, so expressive, that though the listening ear were foreign to it and understood it not, it would be held listening. But there is not a sound. If these people could be seen in their fair stature and build of body, draped in their loose garments, the eye, like the ear, would be vanquished. Such incomparable beauty! Should a sculptor want a model for a work he would leave for all time, he would find it in them: should a painter want a face for his perfected art, he would find it in them; should a poet want the theme for a song on living beauty, he would find his inspiration in them; should a physician want a text for a discourse on the types of health and sanity, he would find it in those types of beauty. In those faces, which actually live to this hour in marble more precious than gold, there would be seen, if they were unveiled from this awful stillness and darkness of the night, two living passions, engraved in life through expression of the soul, resigned grief and sublime fear. What has happened can never be recalled, and grief, therefore, is chastened by reason; but what has happened is so unnatural, so wrong, that reason, in its turn, is sublimed to fear. It is so terrible, none must look on it; if the sun-god, source of of light and life, should see it, he might hide his face and punish all the races of mankind. Well may there sit on every face the chaste beauty of resignation and sublimity of fear!

What can have happened?

There is something that is being carried tenderly, awfully! It is a casket, small and light. It might be a cradle or a cot supporting some object of tender solicitude. A child! yes, a child in all its childish wealth, its golden tresses on its pillow, its features divinely fair and spiritual, its limbs the ideal of grace. Surely in the dead of this night it sleeps, and they are taking it to some golden coast, where in the morning it will greet the sun, lave in the azure sea, listen to the shell picked up by the shore for the mysterious music, and bask in pleasure. Alas! no. As the earth is now dead and silent, its soul of sun withdrawn, so is the soul of that human lovely form; and as the earth is proceeding to enter once more the eternal fire that at once animates and destroys it, so this child of earth is being carried to the pyre.

Beyond expression terrible this event, that they, the bearers and followers, should be so ignorant as to let such beaming beauty die. Had it lived its course, played its mortal part, and like the ripe grain fallen fairly under the sickle of the Immortal Reaper, then, though a thousand suns had shone, the event had been natural, honourable. Then this ceremonial had been public as the day. Tears might have moistened the eye of the lookers-on, but there would be no shame; the deeds of the dead might be themes of honour, or fame, or joy; but shame, no trace of it. The shame is now; the shame that must be hidden in darkness of darkness, as a crime against knowledge, and love, and family, and country, and time! the shame that life in its earliest dawn should be let go, and run no Olympian game, and sing no song, and tell no history, and plant no work of art, and hold no standard, and fulfil no task of duty! They veil themselves from the truth that they may awake as from a deathly dream. Let them pass from us also as a dream.

Yet the dream is true, for I have embodied in these sentences an idea of mankind in that period of human history when, as by a miracle, the human soul burst into the flame which to this day is our great source of intellectual light; the flame that in its own home went out, but from which, while it burned, all the world lighted a torch and carried it away.

While the sculptor of to-day still strikes a light from the dead of that period of intellectual glory, from the very marble into which its fervid life was infused for ever, let us who deal with actual life strike a light from the sentiment regarding the young who fell as they were rising from the drowsy torpor of infancy into the waking dreams of adolescence, instead of passing in natural course through manhood or womanhood, towards maturity, towards drowsy decline.

These wise people knew that life ought to be a perpetual feast. They not only knew the fact, they acted up to it. They were equally well aware that a long and perfect life could alone be attained by perfection of life at its opening, in the seed-time of health. To die at that time was, therefore, an offence against natural rule, against reason, against sentiment. The knowledge of such an event was death to the brain, death to the heart. In this seed-time of health the life was to be made, the life that was to be in truth a life worth living. Animals beneath men, that are worthy of going through their appointed time, and of being made both useful and beautiful, must have their seed-time of health. Shall their human masters be less cared for? If the masters are to be mere slaves, yes; and then it were a pity and a danger; for they who have no respect for life and beauty, who drag through existence and grow weary of it, are to be trusted neither with life, beauty, nor fame.

In the history of great truths derived from the Hellenic wise times, there is not one truth so great as this, and not one so completely missed. It is the secret that was lost. In our day we have lost it so severely that it might never have been in existence for aught we seem to care. The key to all we would have, the key to the gates of health and happiness, has been lost as if it had never been found.

In point of health our children in these times, proud as we are of these times, are our reproach. Where is there a healthy child? I have never seen one. I might search through the length and breadth of the island, I could not find one. You may put before me a child in all its innocence. It has done no wrong that it should suffer; it may show to the unskilled mind no trace of disease; and yet I know that if I or any skilled observer were to look into the history of the life in question it cannot be found intrinsically sound. It will have to battle with future dangers sufficient for the soundest to meet; but it is not itself free from dangers other than those that are prospective and avoidable. It is sure to have some inherited failure, and too likely some that will help to increase the independent risks that lie before it. So our children under five years are expected to die in what may almost be called a definite proportion. He is a fortunate man who, having four children born to him, retains three alive. Later on, for a short time, the danger is reduced; with adolescence it recurs. Again it retreats, but with such failure all along the line, that one-third of the allotted life, the life that would be were it planted in sound health, is only attained.

And for this we have no shame. The sun, the moon, and all the stars may witness our miseries, and we may grieve, but we have no shame. There is an assembly of learned men which I sometimes visit, an assembly of earnest men who are bent on understanding to the full these human failures from health. These men spare no pains, and to gain a spark of light will labour like miners in a mine. When last I visited them a puny feeble spark of life was in their presence undergoing their searching yet kindly scrutiny. Except that it cried a little and laughed a little in changing mood, this spark of life might have been considered a pathological specimen, and in truth it was discussed as such. No one there had a thought of that small life developing into wholesome life and passing through its natural term; not one was there who did not know that the chances of bare life were impossible, and that nothing could be done to save it. The intent was to study the pathology, and fix that by name. They said, when their technical language was translated, this child is suffering from the error, some would say the sin, of its parents. How deep did this error go? In what strange forms did it appear? How singular that the nervous system, once impressed with the poison of that error, should impress another nervous system, and so modify the nutrition of the organism to which it belonged as to cause false nutrition of internal organs and of the very bones themselves! In a whisper one of the learned expressed to another one the pity "that such a specimen of humanity should ever have been born, to breathe and take notice, and smile, and cry, and love, and suffer, and die, and we able to do nothing for it except hope for the relief that should end in the earliest death."

I belong to a committee which takes under its care another class of sad childhood. The members of this community pass before us deaf and mute. We try to give them the power of intelligent converse by laborious and artificial means, and we do some good; but the train of sufferers passes by, and we know that full half are mute from the undeveloped brain; that they are practically lost to life. It is not that the one sense is lost, and thereby the means of expression by intelligible language; it is not even that the nervous organisation which ministers to intelligence is low: it is that these deficiencies are some of the outward signs of a general deterioration of body, and that there is scarcely a structure which the eye of science would recognise as moulded in health.

Passing from the sphere of general observation, from modified to destroyed vitality, I find more startling facts at hand. A short unpretending essay reached me not long ago, in which the writer, who in his too great modesty conceals his name, epitomises the facts he has collected

* From the inaugural address delivered before the Health Congress at Brighton, on the 13th of December, by Dr. Benj. W. Richardson, president.

respecting the attainment of maturity in peoples of different nations. He tells us that of ten children born in Norway a little over seven reached their twentieth year; that in England and in the United States of America somewhat less than seven reach that stage; that in France only five reach it; and in Ireland less than five. He tells us that in Norway, out of 10,000 born, rather more than one out of three reaches the age of seventy; in England one out of four; in the United States, if both sexes be computed, less than one out of four; in France, less than one out of eight; and in Ireland, less than one out of eleven. And, he adds this significant computation, based on what may be called the commercial view of the vital question. "In producing dead machinery the cost of all that is broken in the making is charged to the cost of that which is completed. If we estimate by this same rule the cost of rearing children to manhood, if we calculate up the number of years lived by those who fell, with the years of those who passed successfully to manhood, there would be found between the two extremes presented in Norway and Ireland,—both, be it observed, unnatural,—a loss of 120 per cent. greater in the first year of life, 75 per cent. greater in the first four years of life, and 120 per cent. greater in the years between the fifth and the twentieth, in Ireland than in Norway. In Norway the average length of life of the effective population is thirty-nine and rather more than a half years; in England, thirty-five and a half years; in France, not quite thirty-three years; and in Ireland, not quite twenty-nine years. Thus, again, comparing the best with the worst of a scale of vitality in which both are bad, in Norway, the proportion of the population that reaches twenty survives nearly forty years, or four-fifths of the effective period, to contribute to the wealth of the community; while in Ireland the same proportion survives less than twenty-nine years, or considerably under three-fifths of the effective period.

When we are sitting in the family circle, and are speaking of families that lie within our cognisance, we estimate in the most natural way the happiness of the families by the health they represent. We may thoughtlessly speak of other standards of measurement. We may for a moment dwell on the riches of the house; on the luxuries that are to be seen in it; on the influence which the owners of it might or do exercise in the social sphere, and such like sentiments. But, after all, these rest on health as the basis of the happiness. If one out of every two of the offspring of the favoured house have died, if some who have not died are mute to the world, or otherwise stricken, we soon fall into more thoughtful mood, and say that even this rich home is not a possible home for happy life. Pleasures there may be, happiness there cannot be.

How much worse the estimate of a family in which, together with the vital failures, there is the lack of all that is necessary to make the burthen of life endurable. The favoured in health and means wonder, when they think of it, how such unfavoured endure the life they live. In that sentiment no maudlin canker lies; it is as hard and as free from poetry as a mathematical problem; and for that reason a sentiment that, above every other, is persistently preserved.

What is true of family circles is equally true of nations. Rest, quiet of nations, repose for cultivation of refined arts and sciences, happiness derived from healthy and vigorous minds and intended for healthy, vigorous, and wholesome purposes, there cannot be, when one in two of life can only reach maturity with a survival of three-fifths of effective population. In such a national family there is persistent mourning. It sits for ever in gloom; the blinds of its home are always drawn. It broods, it attributes, as all heart-stricken mourners do, the loss it has sustained to every imaginable and unimaginable cause. It thinks with incoherency; speaks now with hysteric grief, then with hysteric rage, and acts the same. In a word, it follows natural law. State physicians tender their remedies for such families of nations and call themselves curers, as if that could be cured which is Nature pursuing her merciless course towards her merciful dispensations, in correction of those who have outraged her.

I have named this discourse "The Seed-time of Health," and in the sentences foregone I have tried to strike a contrast, and thereby to give to sanitation a broader meaning as a practical science than is commonly connected with it as a system of details respecting ventilators, sewer-traps, and the like.

I want to point to health as the all in all to man; the gate of health leading to the truly good in politics, art, science, letters,—ay, and religion, not less than the least of everything. The strain of my argument is, that unless we make the early life of our children a seed-time of health; unless we, from the root of life, so change the conditions which now exist, all our other measures are practically valueless.

At this moment we have not, as a nation, got this notion set in our minds in such degree as even to accept it, basic as it is, as worthy of serious thought. We have no shame when our young fail and die. Grief we have, fond memories we have; but shame, none. We bury our young as if the act were natural, and erect memorials of it. We read obituaries of the young dead; we read the terrible obituaries of the registrars-general; we discuss in congresses like these the cost of young life; but the shame of the Greek touches us not. The knowledge of the troubles which flow from the lack of the shame reaches us not.

One bright Sunday morning I was in Dublin, in the Phœnix Park. A great crowd formed a vast ring, to the borders of which I made my way. A wrestling match! Men of different counties wrestling in deathly earnest, the lookers-on intent to terror. On not a face in that multitude, barring the faces of some four or five Cockneys, who had a car all to themselves, and grinned as foolishly as they chattered and chaffed, was there so much as a smile. The victors were approved, but not cheered. If this be sport, I felt, it is the strangest I ever knew since I read of Christian trying to be merry in the Castle of Giant Despair. In that same day I traversed the city to see authority armed to the teeth in utterly joyless open places. I visited an exhibition of pictures to experience the same sense of all-pervading oppression. I followed a crowd, and found myself one of another multitude going out of the city, until we reached a place where the members of that multitude were burying their dead; and as they swept by, the train of young dead that was carried in the sight of the sun to sleep in that resting-place was to me as appalling as it was revealing. It was like lightning in persistent discharge. Peace, progress, content, happiness, with this discharge of fearful facts in view! A fable! "As is the earthy," says the priest, "such are they also that are earthy"; and I knew that I had never understood the saying before.

It struck me for the first time as I witnessed this painful phenomenon that with so much young death there could no more be health in the body politic than in the body corporeal. We sanitarians are, however, only bound to treat of that which belongs to our own labours, and acknowledging the perils incident to early life, and it may be even recognising the shame of them, have before us the question of their prevention from its health side alone.

STEAM HEATING FOR TOWNS AND VILLAGES.

THE combination system of heating was described by Captain Galton, at the Society of Arts, on the 7th of December.

The reader said,—Mr. Holly, in the system of combined steam heating which is about to be described, has devised an arrangement of pipes, which he terms the atmospheric radiator, to enable the temperature of the pipes to be regulated. In the combination system of steam heating, the steam, when once it enters the house, becomes the property of the occupier of the house, and the condensed water does not return to the boiler; the steam for the radiators is taken out of the flow-pipe through a valve, regulated by a thermostat, so arranged as to open and close the valves, admitting steam to the radiators; this thermostat may be adjusted to operate to within ten degrees of temperature, so that the heat of a room may be automatically maintained at about the temperature desired. The steam is admitted at the top of the radiator, through the valves, in such quantity as is desired, the bottom being open; the amount of steam admitted is determined by the temperature which it is desired to maintain, and by the amount of radiating surface. Thus, if a moderate temperature is required, a little steam will be admitted to the upper portion of the tubes. The heat from this small quantity of steam will be rapidly diffused by the surface of the radiator through the air of the room, and the inlet valve can be so adjusted as to control the amount of steam admitted; by this means the temperature of the room may be maintained at any required degree. The advantages claimed for these radiators are economy of manufacture, and ease of graduating to all weather; they may be made of tin, or galvanised iron, of any required height and design. The steam and water of condensation give off all their heat, and there being no valve in the return-pipe, and no pressure, there is no cracking and spluttering noise, as in pressure radiators. The steam, after it has passed into these radiators, cools down and becomes water, and passes entirely away from the steam-pipes, to be applied to such other purposes as the house-owner desires, as will presently be explained. Thus, in the ordinary system of heating by steam, in use in houses in the United States, the steam circulates continually from the boiler to the radiator, and returns as condensed water to the boiler; whereas, in the combination system the steam does not circulate back to the boiler, but, after it has passed into the house, passes away as water. That is to say, the steam in this system is taken from a steam main, laid through the streets, just as gas or water is taken from a main, and the heat from the steam is consumed in the houses in such a manner as the owner of the house thinks fit. The following is the general arrangement of the system:—The boilers are placed in a convenient central situation. The results given by Mr. Holly of a series of experiments on several boilers in use by him, show that, at Lockport, he evaporated, on an average, from 6 lb. to 9·5 lb. of water per pound of coal; this, of course, is a matter greatly depending on the quality of the fuel. Mr. Holly speaks in high terms of the Murphy smokeless furnaces, with regard to which he says:—"The perfect combustion and consequent total abolition of smoke from bituminous coal, and relative economy in the production of steam, are not the only points of superiority, as its cleanliness, ease of management, and saving of labour, are almost equally important. The stoking of the boiler resolves itself merely into dumping the coal from cars into the bin above the fire-box in front of the boiler, and occasionally pulling it towards the feed. A little engine carries it into the coking-chamber, dumps it at the proper time on the grate-bars, and by means of levers moving the shake-bars to and fro, slowly clears the bars of ashes. The doors are never opened, and one attendant, without a fireman's skill, will manage a battery of six boilers worked by the same power." This arrangement of furnace appears to have some resemblance to the McDougall furnace in the Smoke Abatement Exhibition. From the boiler, the steam passes into the main-pipes and lateral or branch-pipes. These have been made of lap-welded wrought iron steam-pipes. They vary in size according to the duty they have to perform. The largest yet laid is stated to be 12 in. diameter. The maximum steam pressure would be 100 lb. per square inch; but the pipes are made to resist strains many times in excess of the maximum pressure to which they can be subjected, and they are carefully tested.

It is essential to guard against the condensation, for, unless steam can be transmitted to considerable distances without too great loss by condensation, all devices to use it in buildings, however ingenious, would, of course, be useless. Condensation being caused by the radiation of heat from the pipes, the object is to arrest the radiation, that is, to keep in the heat by inclosing the pipes in the best non-conducting material that is attainable and cheap enough. In order to effect this, the pipe is wound about, first, with asbestos, followed by hair felting, porous paper, manilla paper, finally thin strips of wood laid on lengthwise, and the whole fastened together by a copper wire wound spirally over all. This is thrust into a wooden log, bored to leave an intervening air-chamber between the pipe and the wood, and of sufficient size to leave from 3 in. to 5 in. of wood covering. The elasticity of the wrappings permits the free expansion and contraction of the pipe, irrespective of the wood log, which is securely anchored and made immovable. The whole is placed in a trench a short distance below the surface, without regard to frost. At the bottom of the trench is laid an earthen tile-drain, to carry off any earth moisture; and in order further to insure the continuous dryness of the wood log

enclosing the pipe, if desired, 1½-in. plank is fastened around the log, leaving an air space, and the whole is daubed with coal tar, and covered with earth. Pipes prepared in the manner described have been tested, and it is stated that these tests show that condensation can be reduced to a point that renders the general transmission of steam not only practicable, but profitable; that is to say, that the loss of heat by condensation is under 2¼ per cent. The only actual experiment of which particulars are given, does not furnish so high a result; this experiment was on 1,600 ft. of 3-in pipe, laid on a descending grade of about 1 in 250, the lower end trapped for water, the steam pressure constantly maintained at 20 lb. at both ends, during twelve hours; and the water of condensation, carefully weighed, amounting to 82 lb. per hour; i.e., about ·068 lb. of water per square foot of surface of pipe; that is, 66 units of heat per square foot per hour, or 52 units per foot run. The loss of heat from uncovered steam pipes, with steam of 40 lb. to 60 lb. pressure, may be assumed, probably, at something between 320 and 380 units of heat per square foot of surface, partly dependent upon the outside temperature. The Holly boilers in this experiment are stated to have evaporated 9 lb. of water per pound of coal. Therefore the extra coal required to keep up the loss from condensation amounted to 9 lb. of coal, or at the rate of 30 lb. of coal per hour per mile of 3-in. pipe. The actual amount of condensation in large pipes is greater than in small pipes, but the relative percentage per square foot of surface less than in small pipes. It is stated that from experiments and practice, verified in fifteen cities, the most economical pressure to be maintained in the mains, is from 40 lb. to 60 lb., although in some cities 70 lb. have been used. Experience with large mains is yet limited. The experience of Detroit demonstrates the fact that 60 lb. pressure could be maintained in four miles of 10-in. and 6-in. pipe, against the drafts for power and heat along the line.

In order to counteract the difficulty arising from the expansion and contraction of the pipes, which are subject to extremes of temperature, varying from, say 39° Fahrenheit, and the temperature of steam at, say 60 lb. pressure, i.e., 307° Fahrenheit, a junction and service box are used. These are placed at convenient intervals along the line, of 100 ft. to 200 ft. The arriving-pipe from the boilers is inserted in the service-box, by means of a nickle-plated extension, or telescopic joint, made steam-tight by passing through a stuffing-box. The departing-pipe is immovably attached to the box, so that one end of each 100 ft. of pipe is fast, and the other movable, affording free play to the expansion and contraction. All service-pipes are taken from the junction-box, which is securely bolted to the masonry and anchored to the pipes. The bottom of the box being placed lower than the pipes, all water of condensation is carried forward, and deposited in it; the arrangements for the escape of the condensed water from the steam-pipes will be described presently. At each point of consumption there is a cut-off, under the control of the consumers. The supply-pipes from the mains to the houses are 1¼ in. in diameter, and within each house ¾ in. pipes are used. In addition to the cut-off tap from the main, under the control of the consumer, there is a pressure valve or regulator, by means of which the pressure of steam is reduced, and the supply to the building regulated automatically. This is accomplished by two diaphragms of rubber packing, acted upon by weighted levers, and moving two slide-valves. The first valve is weighted to 10 lb., and the second to 5 lb., or 2 lb. if required. When the steam arrives at the first valve of the regulator, it is under a pressure of 60 lb.; on passing through the first reducing valve, the pressure is reduced to 10 lb.; it is then passed through a second reducing valve, and the pressure lowered to 5 or 3 lb.; thence it passes at this uniform pressure through a meter placed above the regulator, for measuring the amount of steam which passes into each house. Unfortunately, I am not in possession of a drawing or description of these regulating valves or of this meter sufficiently clear to enable me to explain their action in detail.

The distribution of heat in the apartments is by means of the radiators before mentioned, which are of the ordinary shape, consisting of inch-pipes about 22 in. long, placed vertically, either in a circle or in a double row, and connected together top and bottom. The action of these, in enabling the heat to be regulated, has already been explained. The steam, in passing these radiators, becomes condensed into water at 212°. The heat then remaining and the water may both be utilised. In order to effect this, it is conducted in protected pipes, from all parts of the building where steam has been used, back into the basement, through a specially-devised trap. Here it may be used as warm water, or it may be used for warming fresh air; in this case it is passed into coils of pipes set in a brick chamber; into this chamber cold air is admitted from outside of the building, as in the air-furnace, and coming in contact with the coils of pipes containing the hot water, abstracts the remaining heat, and passes up through the registers into the rooms above, as warm, pure air, while the water, now cold, passes into the tank, for future use if required.

We select the observations of two of the speakers who afterwards commented on the system.

Mr. J. A. Coleman said he had had the honour of reading a paper before the Society of Arts as far back as February, 1875, on a similar subject; and when he visited America a year or two ago he went to see Mr. Holly's system and examined it very thoroughly. A company having several mills in one enclosure would not think of putting a battery of boilers in each, but would collect them at a central point and distribute the steam; it was equally practicable to distribute the steam to a whole town. As to the lack of ventilation ascribed to the system of steam heating, that was a matter for each individual to arrange for himself; some did not provide it, but others had the radiators in the basement, with air conduits from the street, and the fresh air thus warmed was conducted into the rooms above, and this was a much superior plan. The fresh air which was always coming in had to go out again, and thus ventilation was provided for. It was apparent that the economy of this system must be very great, if the one question of condensation in the pipes was settled; and that had been very fully settled. Fifteen or twenty years ago steam was carried 800 ft. or 900 ft. in pipes placed on posts in the open air, and protected in a very simple way; and large steam-engines were driven by the steam passing through the pipe. Mr. Holly showed him his method of covering the pipes, which differed somewhat from that suggested in the paper he had referred to, which was to enclose them in any good non-conductor, such as sawdust, and lay them in brick conduits, so that they might be got at without tearing up the streets, and with a waste-water pipe at the bottom of the conduit, to return the water to the boiler where practicable. Mr. Holly told him, two years ago, that in a mile of pipe he lost less than four per cent. by condensation, which was quite insignificant; but even that figure seemed to be now reduced. With regard to the cost of heating buildings, the figures quoted would hardly convey a true idea to an English mind, because there were no winters here such as they had in America. Last winter was considered very severe in England, but in America it would have been considered very ordinary winter weather. When investigating this subject, he took a large building like A. T. Stewart's in New York, treated it as a box containing so many cubic feet, found what the coal and engineering bills were, and distributing the amount over the cubic capacity, found that the cost averaged by the then existing methods from ·87 to 1·3 cents per cubic foot per annum; while under the system he proposed the cost was reduced, to speak roughly, by about 50 per cent. He remembered open fires in America in his boyhood, and they were always a nuisance, from the dirt and dust they created; it was the same in a lesser degree where an open furnace in the basement was used for warming the building. The saving of labour, and the advantage of being able at any time of the night, if you were ill, by simply turning on a cock, to get the heat you required in a few minutes, must be apparent at a glance. Mr. Holly told him that the difference in the wear and tear of furniture was already very appreciable. If gas-works had to be put up in every private house, gas would be almost too expensive to use, but when gas was manufactured on a large scale the result was, that even with all the progress of electricity, up to the present time, it continued to be a very profitable branch of manufacture. The same principle applied to steam. When he took out his first patent, the patent authorities at Washington told him that the system of heating cities by the use of steam ranked next to the introduction of gas and water. The idea of the whole system which had been floating in his mind for years, took definite form on the night of the Boston fire. His first idea had been to devise a system for protection against fire, and the importance of that subject might excuse him saying a word or two upon it. Both there and in America, buildings had grown out of the reach of the fire apparatus, on account of their height being such, that however powerful the fire-engines, the hose would not stand the required pressure. The consequence was, he adopted for warehouses a system of iron sprinklers, such as are in use in large mills. The sprinklers were connected with a main water pipe in the street. An improvement had since been made on this system by fixing pipes on the ceiling having caps every 10 ft. in length. These pipes remained full of water; a heat of 160° would release the caps, and the pressure of water from a tank on the roof would throw a spray over 100 square feet. If the fire extended farther, another cap would be released, and give an additional shower, and it was only in very severe cases that recourse had to be made to the mains in the street. As they could not depend in all cases on the city fire-engines, the collection of boilers in a central place for supplying steam, gave the power, ready at any time, to work the auxiliary pumps.

Dr. Siemens, who was in the chair, in proposing a vote of thanks to Capt. Douglas Galton, said this question was not a new one in the abstract, for heating by steam had been carried out to his knowledge forty years ago. But there was a novelty in the proposal to generate steam in large volumes, at high pressure, at certain centres; and to send it at that high pressure for miles under the streets. It was also perhaps a novelty to divide steam by regulating and stopping valves, and supply it to individual houses, so that it might be used for the various purposes mentioned. The great question which presented itself was, would such a pipe be trustworthy; could it be laid and maintained for this purpose without danger and without trouble. The paper described an elaborate method of insulating the pipe to prevent excessive loss by radiation, and, from the figures given, it seemed to have been very successful; but it appeared to him doubtful whether, in our streets, a pipe so swelled out by insulators, and logs of wood, and planks, could be laid. The space below our streets was already so fully occupied, that the establishment of such pipes would present very great difficulties. As Sir Frederick Bramwell remarked, if they wanted to bring heat into houses, there was another means already established, and in full operation; and from a little calculation he had just made, he found that a cubic foot of coal-gas brought with it about 750 heat units, which would be about the same amount as would be supplied by 3¾ cubic feet of steam, at a pressure of six atmospheres. The question, therefore, would reduce itself to this, whether the one pipe or the other could be maintained with the least expense. He, for one, must adhere, for the present, to the opinion that it would be easier to supply gas than steam. The paper spoke of various modes in which steam heat could be used, and the radiator was alluded to, but he did not think that apparatus was very happily named. A steam-heated surface in a room no doubt radiated heat, but not under the same conditions as a fire-place. Probably, nine-tenths of the heat given off from that hot surface would be given off to circulating currents of air, which would pass again and again through this radiator, and a very small portion would pass by radiation into the room. The rays from such a low source of heat would hardly be felt, as radiant heat, at any sensible distance from the source. Now, he looked upon an open fire-place not only as a thing endeared to them by long habit, but he attributed to it very high sanitary qualities. The open fire-place communicated absolutely no heat to the air of the room, because air being a perfectly transparent medium, the rays of heat passed clean through it. It gave heat only by heating the walls, ceilings, and furniture; and here was the great advantage of the open fire. If the air in the room were hotter than the walls, condensation would take place on them, and mildew and fermentation of various kinds would be engendered, whereas, if the air were cooler than the walls, the latter must be absolutely dry. That was the great advantage of the open fire, and it endeared it to them, though many did not know exactly where and how the comfort arose. The

Americans were very ingenious, but he would not take their word with regard to the comfort of their rooms; when he was there he suffered severely from the closeness of the atmosphere of the dwellings, and when he travelled at night in the sleeping-cars he was obliged to get up four or five times and step out on the foot-board to get thoroughly cool. The only explanation he could offer was that the attendants were black men, whose standard seemed to be the interior of Africa. But although he could not agree absolutely with the proposal, yet the question of doing away with the smoke and nuisance which now resulted from open fire-places was so important, that any suggestion, backed by a considerable amount of experience, was welcome; and Captain Galton well deserved their thanks for the able manner in which he had brought the subject forward.

BATHS AT WINDSOR.

A SWIMMING-BATH, for the use of the students at Beaumont College, has just been completed at a cost of 3,500*l.*, from the designs of Messrs. Byrne & Crombie, architects, of Windsor and London. The site, which adjoins the College, is 60 ft. above the level of the Thames, and some 510 yards distant from it, necessitating the water being pumped and forced up to the bath. This is effected by a 10-horse-power engine and steam pump placed 500 yards from a well at the entrance to the college grounds, and forced thence a further distance of about 200 yards through the supply-pipe of a No. 5 pulsometer, supplied by the Pulsometer Company, of Queen Victoria-street. Connected with this is an upright boiler, 4 ft. 6 in. diameter, and 11 ft. high, which heats the water in the bath at the same time.

The bath-house internally is 80 ft. wide and 25 ft. high; the swimming-basin is 66 ft. long, 30 ft. wide, with a depth at one end of 4 ft., increasing to 7 ft. at the other end. The basin itself is formed of cement concrete, 3 ft. thick sides, and 18 in. thick bottom, 4 parts gravel and 1 part cement, rendered inside 1½ in. thick with Portland cement, and again lined with Cliff's white glazed bricks and ornamental pattern borders. The internal walls are rendered in Keene's cement, with a dado, 6 ft. high, of Minton's glazed white tiles, with figured strings top and bottom.

The roof, which is built of a very light construction, is of wrought iron, from the firm of Messrs. Davis Bros., Wolverhampton. The sky-light, which runs the whole length of the building, being glazed on Helliwell's patent system.

Two sides of the bath are provided with dressing-boxes, thirty-two in number, with cloak-pins and seats, &c., for each bather. The whole of the external woodwork is stained in two shades, and varnished, the moulded cornice being stencilled.

Special arrangements have been made for ventilating and preventing the condensation of vapour from the bath. The basin itself, containing 50,000 gallons, can be easily emptied in about two hours by an overflow-pipe, which allows the water to pass over a filter-bed, and thence purified into a watercourse in the grounds of the College.

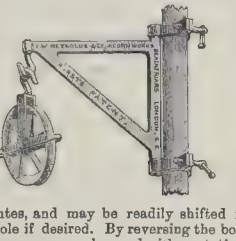
Messrs. A. L. Oades & Sons, of Egham, were the general contractors, Mr. Ventom being clerk of works.

FALL OF A CHURCH BELL.

A REMARKABLE accident, fortunately unattended by loss of life, happened on November 24th in St. Augustine's Church, Vienna. The great bell, named "Ferdinand," fell suddenly while it was being rung for vespers. In its fall it crashed through the staircase and the massive iron works of the church clock. The bell, which weighs 57 cwt., was hung in 1854 in the newly-erected tower of the church, but could not be used until 1863, the tower being too small for it. The bell is usually rung by the verger and the bellringer, sometimes assisted by boys. On the day of the accident three of the latter were present. The two men and the boys stood quite near the bell, pulling the two ropes by which the bell is swung. Soon after the first few pulls the bell began to creak, then was seen to part from the beam and to remain thus suspended for a few seconds, and then fell, its fall being arrested just below the clockwork, where it got jammed between the massive oak beams of the stairs. Though all this happened within a few seconds, the persons in the belfry did not lose their presence of mind. Two of the boys and the bellringer rushed down the stairs, and found safety in the windows below the clock. The verger and the boy nearest the bell jumped into wall niches close by, the bell almost touching them in its descent. Only when the bell was perfectly at rest, the verger and the boy, who happened to be his son, tried to leave their dangerous place of refuge, but found the way barred by stones and crushed beams, as well as by the bell itself. It was only owing to the fact that at the moment of the catastrophe they had not let go of the rope that they were able, holding fast by it, to perform the dangerous descent. Only one of the boys was hurt, who, in rushing down the stairs, fell, and suffered a compound fracture of the shin bone. The commission which was at once appointed to report on the accident ordered the speedy erection of a scaffold under the tower, to intercept a possible further downward movement of the bell. After its completion, the work of reinstating the bell in its former position will be proceeded with. The catastrophe is at present ascribed to a gradual loosening of the screws which secured the bell to the beam. The tower is not in danger, but it appears to be overweighted, for, besides the fallen bell, there are four more in the tower, the weight of which is together 60 cwt., thus making the total burden 6 tons.

A NEW SCAFFOLD HOIST.

THE invention illustrated below was exhibited at the Smithfield Club Show. A block and fall would even more generally be used for raising building materials if there were not so much difficulty in finding a suitable fixing for it. This difficulty is overcome by Hurst's Patent Scaffold Crane, which can be fixed to any sized pole in a



few minutes, and may be readily shifted from pole to pole if desired. By reversing the bottom collar, the crane may be used either stationary or swinging. The one exhibited was made to lift 2 cwt., but we understand they can be made to any size desired. F. W. Reynolds & Co., of Edward-street, Blackfriars, have secured the sole right to make and sell these cranes, which will probably soon come into general use.

"DEVELOPING SOUTHAMPTON."

I HAVE read the article on Southampton in your paper with some interest, and I take this opportunity to offer some further information thereon.

The paving of some of the footways with blue brick in lieu of stone has effected a saving in the first cost, and enabled the Corporation to extend their operations; but upon the question of blue brick *v.* Caithness stone there is some difference of opinion. The blue brick can be laid at about half the price of Caithness stone, and, therefore, has the preference; but the general appearance, is a main thoroughfare, is certainly not equal to the stone.

The Corporation have put in force the well-known section 150 of the Public Health Act, and the new roads in Portsmouth have been made up by the Borough Surveyor in default of the owners so doing; but we do not consider these new roads "street improvements," they are the natural outcome of the growth of towns.

As regards street improvements, such as removing projections, widening streets, and removing courts and alleys, there is much to be done in the old part of the town, but I hope the day is not far distant when important works in this respect will be carried out.

The new bridge over the South-Western Railway is an important work, as it gives uninterrupted communication between the east and west of the town, and closes two dangerous level crossings close to the terminus and adjoining the station-yard. This bridge is carried by iron girders over the railway, and also over Hartley-street adjoining. The approaches are of considerable length, the greater portion being formed of elliptical arches in red brick. The width between the parapets is 50 ft., and the worst gradient 1 in 30. As the western approaches cross the Cattle Market, a partial reconstruction thereof will be necessary.

The works have been designed by the company's engineer, Mr. William Jacomb, and are being carried out under the superintendence of Mr. J. Drage, on behalf of the company, and of myself on behalf of the Corporation, by Messrs. Joseph Ball & Sons, the contractors.

Southampton has long been in want of better railway accommodation between the North and West of England; and the inhabitants have made determined efforts to remedy this defect, but hitherto without success; there is now, however, some prospect of their hopes being realised.

The Didcot, Newbury, and Southampton Railway Company propose to carry out important works in the borough. Two stations are to be provided, one at Bargate-street, near the centre of the town, and the other at the Royal Pier. The Bargate-street Station will be the chief, and to give a good approach thereto from the High-street, the company propose to widen Bargate-street to 60 ft., and to take down several houses on the west of the old Bargate, so as to form a circus on that side. In addition to this there is a project to remove the corresponding houses on the east side, so as to leave the Bargate in the centre. If they be carried out, it will be a most important improvement of the High-street.

The proposed 60 ft. roadway across the western bay will give a new route to and from the pier, and enable the local authorities to extend their tramways from the Town Quay, carry out jetties, and enlarge to a considerable extent their quay frontage.

The South Western Railway Company have also not been idle; they have deposited plans showing new railways and land reclamation on practically the same lines as the Didcot and Newbury Company. The new street to the Bargate being nearly the same, and the land proposed to be reclaimed being about fifty acres.

In addition to these two companies, there is the Swindon, Marlborough, and Andover Railway Company, who desire to enter Southampton over the South-Western system from Andover. The two first-mentioned companies having adopted the same scheme, and the spirited action of the Local Authorities, will, I hope, convince Parliament of the necessity for better railway accommodation at this important port.

As regards the Southampton harbour, will you permit me, as engineer for the scheme, to add to your remarks a few details of the work?

It is proposed to construct a double line of tramways from the boundary of the Commissioners' property on the western shore to the Town Quay, and to duplicate the present lines to the Southampton Docks; to widen the Royal Pier, and to carry a double line of tramway to the Pontoon, thus providing every facility for increased traffic from the north and west to the Isle of Wight; to reclaim the foreshore east of the Royal Pier for a width of 80 yards, and to erect a new quay wall; to further extend the Quay seaward into deep water for 120 yards; to construct a new quay or jetty 135 yards in length; to erect new warehouses; to provide for dredging the harbour, erecting lights, and for other works.

I think the above summary will show that the Local Authorities are doing all they can to improve and extend the works committed to their charge.

JAMES LEMON, M. Inst. C.E.,
Consulting Engineer, Southampton.

Soane Museum, Lincoln's Inn-fields.—The trustees held their quarterly meeting on Thursday, the 8th inst. Professor Donaldson, Mr. David Mocatta, and Mr. Alan Cole, were present; also Professor W. H. Flower, F.R.S., who attended for the first time after his recent nomination by the Royal Society as the trustee to succeed the late Sir Philip Egerton. Mr. Wild, the curator, reported that the number of visitors to the museum during the present year had been 3,737, and that he was preparing a new edition of the Handbook, illustrated with many additional engravings.

ANCIENT SURREY.

Sir,—In Tymms's "Home Circuit," the cave of Ludlow's Hole, excavated A.D. 1216 as a reservoir for Waverley Abbey, is described, p. 138. Also, Hind Hill, 923 ft. high, described in W. Cobbett's "Rural Rides," with the cavity of the Devil's Punch Bowl, and mentioned in the tale of "Nicholas Nickleby." The manor-houses at Cheam and Clapton; Tooting Church, with its round tower; Tandridge Priory, *temp.* Richard I.; Benbury Camp at Wimbledon, A.D. 568, are described. Reference is made to the "plant about the thickness of a bullrush, with a top like asparagus, shooting up nearly to the surface of the earth, above which it never appears, and when the corpse is consumed, the plant dies away."

This observation has been made in Send and other churchyards, where the soil is light red sand. The fact was noticed by John Aubrey in his "History of Surrey." In *Notes and Queries*, sec. 5, vol. 5, 1876, pp. 169-297, it is suggested by two writers that it may be a species of *Equisetum Telmateya*. In vol. 13 of the *Penny Magazine* are views of Farnham Castle, of Nonsuch House, of Chertsey, and of Croydon Church and Palace, also of a mill near Waddon, and of Beddington Church. In the *Saturday Magazine*, vol. 14, information is contained as to Elias Ashmole; in vol. 19, as to Kingston-on-Thames; and Guildford Castle, vol. 6.

In the British Museum Library, Add. MSS., Nos. 6,735, f. 120, 122, and No. 6,746, f. 15, are the curious collections of R. Symons; No. 24,004-5, various views in Surrey; No. 25,712, Add. MS., Surrey in the nineteenth century; No. 4,704 MS. describes the ancient Surrey tenures, such as Borough English at Dorking. In a volume of excursions, 8vo., Longmans & Co., A.D. 1822, there are views of old buildings in Surrey, Lambeth Palace, &c., which are described. This is one of several similar topographical volumes descriptive of England.

In "Select Topography," by W. E. Trotter, 1830, are engravings of Richmond, Dorking, Leatherhead, Walton-on-Thames, Shepperton,—in Saxon, "Sceapheard-ton," a habitation of shepherds. In Carter's folio views, B.M. Lib. Add., are views of Farnham and Guildford Castles, with the chapel on the hill, and several at Oatlands House, restored in the nineteenth century. Waverley Abbey, also, is noticed.

In his "History of the Protestant Reformation," W. Cobbett described abbeys at Aldbury (*temp.* Richard I.), Barmondsey (1089), Chertsey (666), Lingfield (*temp.* Henry VI.), Merton (1116), Newington (1551), Reigate, founded by William de Warren, Earl of Surrey; Shene (1414), Southwark, St. Mary Overy and Overy Hospital (1228); also Tandridge or Tanregge (*temp.* Richard I.), Waverley (1128). In his "Rural Rides," also, this author described places in Surrey. The house at Farnham where he was born is, I believe, extant, being the Jolly Farmer Inn.

In Howitt's "Visits," vol. i., Wolsey's Tower at Esher is engraved (p. 245).—that is, the Gate-house. The mansion of Bishop Waynflete, extant 1673, in Aubrey's time, is destroyed. At Apscourt, near Molesey, are, or were recently, the traditional remains of Wolsey's house, said to derive its name from A.P.S., the three letters in Archiepiscopus. Near Walton the old mansion of Ashley Park is attributed to him. Richard Symmes's "Surrey Collections" were given to Mr. W. Bray, in 1813, by the Earl of Onslow (see Add. MSS. 6,167, B.M. Lib.), being tolerably legible, chiefly Latin contracted. Mr. Symmes was the town-clerk of Guildford (22 Charles II.) 1670. He died in 1680. The Add. MSS., 11,573, are the notes of Mr. Tyton in Surrey. The Add. MSS., 11,571, contain also notes of Surrey in large and small folio. In John Aubrey's "Surrey," 1673, five vols., 1719, with his portrait, it is stated that Baynards, near Cranley, was built by Sir G. Moore, A.D. 1577. It is engraved in Hone's Year Book, pp. 930 938, with a description. Wotton Church, p. 313, and Banstead Church, p. 352, with its leaning spire, and Dorking Church, are described. In the *Gentleman's Magazine*, vol. lix., p. 1 (1789), Weston House is engraved. In vol. lxxi. is Oatlands, and Winchester Palace, Southwark, is in vol. xviii., part 2, which I described in the *Builder*, No. 1765. In Neale's "Views of Seats," second series, 1826, vol. iii., are views, with a description, of Albury, Clandon, Deepdene (three views), Ockham, Roehampton House, and Shalford. In the first series are views (vol. iv.) of Ashley Park, Ashstead, near Epsom; Beechworth, Claremont, and Farnham Castles; Ham House, 1821; Loseley, 1562-68,—the hall being 42 ft. long and 25 ft. 2 in. wide; the Oaks, near Epsom; the Rookery, near Dorking; Shirley and Selsdon, near Croydon, with Sanderstead, are engraved. In Nash's "English Mansions," folio 1869, Beddington Hall, Sutton Place, and Loseley are engraved. Sutton is described as "a splendid specimen of the enriched brickwork of the time of Henry VIII., built about A.D. 1530, being red brick with chequer work of black brick." Beddington was rebuilt about 1609, except the hall. At Loseley there is stated to be a portrait of Sir W. Moore, the founder. Aubrey mentioned, at Titsey, near Ewell, a large old mansion near the church; a copper coin of Constantine the Great was found there. At Crowhurst Place, near Lingfield, was the ancient residence of the Gainsford family before the Norman conquest. This old timber house was moated. The hall was open to the top, and the windows were full of escutcheons. It was sold in 1706, valued at 400*l.* yearly. At Guildford, the almshouse, of brick, quadrangular,—a noble tower, having at the entrance four small turrets over the gate, founded by Archbishop Abbot,—is described by Aubrey, who stated "Lothesley, a seat of the Moores," is about the time of Henry VII., with its armoury and antique furniture. He alluded to the plan of the shepherds at Epsom hurling stones from a half-horn at the top of a pole to keep their sheep on the Downs within bounds. Mr. Aubrey mentioned a camp of twelve acres on Walton-hill, that is St. George's-hill. He was informed by Ashmole that the old current of the Thames is here changed, and the part of Middlesex over against this place was divided formerly from Surrey, about A.D. 1450. W. Lilly, whose tomb is in Walton Church, practised as a M.D. at Hersham, under a Lambeth degree. In 1652 he bought his house for 950*l.*, and bequeathed it to a son of Sir Bulstrode Whitlocke. Oatlands Aubrey described as "a very fair house." In 1673, a brick wall encompassed ten acres of ground. Only a few parts of the house remained then, and, ere long, it was destroyed. C. C.

THE DUMBIEDYKES.

There is a district in the neighbourhood of Edinburgh, within the Parliamentary borough now-a-days, which we had recently occasion to visit in connexion with the opening of a new church. A few jottings we made at the time may be of service to some of our readers. It is, of course, unnecessary to quote Sir Walter Scott, who, in his celebrated novel, the "Heart of Mid-Lothian," gives some prominence to the admirer of Jeanie Deans, the Laird of Dumbiedikes.

The Dumbiedykes is simply *Scotice*, or, rather, old Anglo-Saxon, for the "dumb-walls," *i.e.*, the locality of the walls of a former Institution for the Dumb; or, in other words, the old building which may still be seen at the foot of Brown-street. It was once the palace gardens of Holyrood, but within the recollection of old inhabitants it was devoted to the useful occupation of market gardens.

At this moment it is by far the most densely-crowded district in Edinburgh, forming an adjunct to the overgrown and, at one time, suburban parish of St. Cuthbert. In the space of probably half a mile it contains a population of over 19,000, a circumstance of itself deserving of study. How this population has been provided with houses, and the character of these houses, are not unknown to our readers; in point of fact, the district has been the scene of two or three of the highest and most successful efforts to provide houses on a large scale, and at a moderate rent, to the working classes of Edinburgh, which is somewhat curious. The origin we will briefly explain.

Five-and-twenty years ago the Government needed a site for a new post-office in Edinburgh, and selected that of the old Theatre Royal in Princes-street; no doubt, one of the most central and commanding situations in the whole city. We remember the old theatre very well. Siddons, Scott, Mackay, Murray, the elder Kean, Macready, were all *débutants*. In fact, the old Theatre Royal was as celebrated as Drury Lane. The carcass of the old theatre, together with the surrounding buildings called Shakspeare-square, were purchased by the late Mr. Robert Hunt, an opulent builder in Edinburgh, for a mere trifle. As the cry for workmen's houses was then at its height, he bethought him of utilising this waste ground at the Dumbiedykes; and we are bound to report that his perception was good. He accordingly *leased*,—or, as it is called in Scotland, *feued*,—the whole line of frontier facing the Queen's Park, and thereupon turned the old stones of Shakspeare-square into humble yet commodious and comfortable houses with three rooms, fitted with good fire-grates, good gasfittings, good water-supply, and excellent water-closets.

The houses filled with tenants at once. A demand arose. The demand was quickly enough followed by the supply, which grew so much that in another year or two the waste ground in the whole district was built upon. But the ground was of the nature of a heavy slope facing the Park, and of a different formation.

The Iron Church was set up about ten years ago by one of the best preachers, Mr. Ferguson; and on the 29th of May, 1880, the foundation-stone of the present church was laid by Lord Rosslyn, Commissioner of the General Assembly, with Masonic honours. The new church was opened on Sunday, the 13th of November. The style is Early English. The building has a graceful spire, and a solid and substantial substructure, good interior (plain, but substantial), a covered timber ceiling, nicely proportioned, with galleries supported by handsome brackets tastefully decorated. The architects are Messrs. Thornton & Shiells.

THE NEW SYSTEM OF COMPETITIONS.

Sir,—Now that the preliminary drawings for the Glasgow Municipal Buildings have been sent in, it may be well, in the interests of future competitors, to consider the working of the amended scheme for public competitions, more especially as there seems to be a disposition to make the regulations for this one into a model for others of a similar kind, and even for those of much smaller magnitude.

It will probably be a surprise to the assessors to find what a mass of labour their instructions have entailed upon those who have conscientiously striven to follow their leading, and it is very desirable they should realise this, in order that they may, in every possible manner, lighten the labour of those who are chosen for the second round in this competition. It cannot be necessary to require much more from them, as the drawings already sent in comprise a plan of each of the four floors, four elevations, two sections, and a view. These are of themselves almost, if not quite, sufficient to decide upon, and any further drawings required ought only, in common fairness, to be such as to test the capability of the selected men.

Any attempt to exact complete sets of plans, &c., to an eighth scale, would involve a vast amount of labour, which in nine out of the ten, would be unnecessary and useless, and for which the remuneration proposed would be quite insufficient. In fact, one-tenth scale would be ample for any such purpose, the reduction from one-sixteenth to one-twentieth having proved of little advantage, the latter scale requiring considerable accuracy and precision in drawing.

In any future regulations of this kind it is most important that the labour should be minimised in the first trial of skill. Except for buildings of unusually great importance, two or three drawings to a small scale, with option of being drawn in pencil, would be quite sufficient to enable a qualified architect to select the best for further development. Observer.

Timber Yards in the Metropolis.—At the meeting of the Metropolitan Board of Works on the 9th inst., the draft of the proposed New Metropolitan Bridges and Management Bill was under discussion. Exception was taken to the clause which proposes to impose new conditions and restrictions as to the size and position of timber stacks, and it was urged that persistence with the clause would endanger the whole Bill, owing to the powerful opposition of the timber trade, whose interests are greatly affected by the clause. On its being put to the vote that the clause be retained in the Bill, 12 members voted for it and 13 against it. A division being demanded and taken, the votes on either side were equal,—15 to 15,—whereupon the Chairman of the Board gave his casting-vote in favour of the retention of the clause, which was, therefore, left part of the Bill.

THE NOMENCLATURE OF COLOURS.

Sir,—It is of great importance that a correct understanding should exist as to what a certain word or name represents as regards a given colour.

For some time past I have noticed that the stainers (*i. e.*, the natural colour ground in oil or water) of various firms differ considerably. I have taken yellow ochre, raw sienna, burnt sienna, Venetian red, Indian red, raw umber, burnt umber, in a certain quantity, from three good firms, have mixed them with a regular proportion of four to one good old white lead, and found the result most conflicting and contradictory; in fact, for example, the stainer of one firm called yellow ochre appears in the case of another firm to be raw sienna, and raw sienna in another firm to be the Venetian red of a third. Now, this is of importance to the client wanting the best character of work, to the architect intending to obtain it, and to the decorator desiring to execute the same. But in matters of colour where is the standard? Would it not be within the province of the Painter-Stainers Company to attempt the solution of the matter by getting a standard fixed as to what the name of each colour represents?

It does not follow that firms would supply to that standard,—that would be a question of price and commercial dealing,—but an admitted standard for reference would be of practical value to both architect and decorator. I trust you will give your valuable aid to the solving of this every-day difficulty.

Stephen S. Phillips.

WOODS.

Sir,—A good many erroneous impressions prevail respecting timber. We always had an idea, in common with others, that walnut was a very rich and expensive description of wood. Probably auctioneers' catalogues of eligible and tasteful furniture had the effect of heightening that idea. We learn, however, from a specialist in the trade that English walnut is almost valueless, the Italian walnut being that alone for which there is any demand in the market. Many antiquaries formerly contended that the wood generally used in the construction of houses anterior to the Great Fire was chestnut, but in the vast majority of cases this was the common oak. The famous woods formerly round Sittingbourne, of Spanish chestnut, favoured the popular idea that it was indigenous to England.

A. B. C.

THE STYLE FOR A NEW CATHEDRAL.

Sir,—You have already noticed, without approving, that in last month's number of the *Nineteenth Century* Canon Venables urges very forcibly the adoption of Sir Christopher Wren's first design for St. Paul's Cathedral for the proposed Cathedral of Liverpool, and while agreeing with him that this would be doing honour to our greatest Renaissance architect, yet I wish to point out a few fallacies with which the Canon supports his argument.

In the first place, he banishes altogether the Byzantine architecture as an appropriate one for Christian churches. The fact is, however, that the style of St. Sophia is the grandest and most perfect yet conceived for the purpose of Christian worship, and in no way could Liverpool show better her common sense and independence of prejudice and conventionalism than by erecting her new cathedral in this, rather than in the Gothic, Roman, or any other style.

On the other hand, it is, I think, presuming too far to take it for granted that the Gothic is universally allowed to be the only style suitable for a modern church. It is true that a great reaction in favour of our ancient architecture has followed from the insipid and tasteless buildings with which we were for so long overrun under the name of Italian; but there is little doubt that this has been carried too far, and that the countless churches built all over the country are more suitable for Roman Catholic worship than the altered requirements of the Protestant religion. In building our dwelling-houses, though we may still keep our own beautiful pointed arch and various other things which our forefathers before the outbreak of the destructive "Classical" mania had patiently and carefully evolved for us, we still find it necessary to adapt and modify considerably to suit modern requirements very many features of Gothic architecture as it was left us by the sixteenth-century builders, and it is, therefore, pedantic and inconsistent not to do the same as regards churches.

It is a very good thing, no doubt, to vary the monotony by introducing different improvements, or even specimens of entirely diverse styles, from other countries, and England, like many other nations all over the world, owes some of her most splendid efforts of genius, and most picturesque elements, to the adaptation of Renaissance features. But mere mechanical copyism or indefinite multiplication, whether of Corinthian capitals or Gothic arches, without any reasoning adjustment to advancing necessities or play for individual talent, is death to all art, and not, in fact, architecture at all; and dread of the stereotyped jumble of bits taken at random from Gothic edifices, or the inevitable wearisome rows of imitation Greek columns (which, with the chimney-pot hat, appear to be making the tour of the globe), that will arise if either of these "styles" is decided upon, makes us ready to fall back on a really noble and original design, even if somewhat stale, of a talented artist like Wren.

The only other arrangement from which we might expect anything better can scarcely be hoped for, namely, that an opportunity should be given for the embodiment of a new development appropriate to present uses, and which, though on the basis of Gothic, should combine the structural fitness of the Byzantine style, and avail itself of the various mechanical and æsthetic improvements suggested by modern science.

Evacustes.

EMBLEM OF THE TRINITY.

Sir,—In the *Builder* for December 10, in an illustration pertaining to Mr. Dobson's lecture upon "Symbolism," is given a representation of the Holy Trinity, as shown in some stained glass at St. John's Church, Micklegate, York. It is fourteenth-century work.

It may be passingly interesting to record that an almost precisely similar embodification of the Trinity exists at Black Abbey, in Kilkenny. It is carved in, if I remember rightly, alabaster, and bears the date, at the foot of the cross, of A.D. 1264. Its proportions are exactly the same. The Eternal Father, however, at Black Abbey is crowned, and holds both hands, not one only, up in the act of blessing. Further, the dove, instead of being at the left side of our Lord's head, in the Irish example, is immediately above it. In both examples our Lord is crowned with thorns, and altogether the general affinity between the two is remarkably great.

Harry Hems.

HOMES OF THE LONDON POOR.

Sir,—In your issue of the 26th ult., under the above heading, is a report of an inquest, which shows what dwellings the humble toilers in London have to take up with. The man being a music printer was possibly like many other printers working in London offices, excluded from the workmens' train in consequence of his hours,—eight a.m. till eight p.m.,—and therefore obliged to live near his work. There are at this time many printers living in the courts of Fleet-street, whose children are employed as machine-boys in printing, bookfolders, &c. It is plain that workmen's trains do not suit printers, although more of them have been dislodged than any other class by the City improvements and railways. Printing having been so long and extensively carried on in the City their case is deserving of notice.

Perhaps it may be asked why such uncomcomfortable rooms are taken. To this I would answer, the supply does not appear equal to the demand; and again, cheapness has to be considered, for all have not constant work; and last, but not least, the Assessment Committee, with their professional valuer, have a great desire to increase the annual value of houses, because it is an easy way to raise the local taxes, which tends to increase the rent of rooms, neglect of house repairs, &c.

H.

The Parish Church of Blythburg, Norfolk, has been closed by order of the Bishop of Norwich, on account of the dangerous condition of its fine hammer-beam roof. The church is called one of the best examples of semi-Flemish thirteenth-century architecture, but it is altogether in a very dilapidated condition.

SAFETY FROM FIRE OR PANIC IN PLACES OF PUBLIC ASSEMBLY.

Sir,—Terrible experience, of which history is silent, may have taught the architects of Greece and Rome; for the ruins of ancient theatres and amphitheatres are perfect models in material and construction for ensuring the safety of great assemblies from the dangers of fire or panic.

But even if we had unlimited funds at our command, our climate would not permit of a series of stone benches rising tier above tier under the open sky. Still, although we cannot have solid structures of stone or brick throughout, more might be so built,—at least, the proscenium should be of plastered brick.

The spectacular demands of the modern stage require artificial lights, inflammable dresses, and scenery that increase the danger from fire; and the knowledge of this by the audience makes them ready to be panic-stricken at the slightest alarm.

The progress of a fire in a theatre is now so rapid that it would be almost impossible to increase the means of egress to such an extent as to assure the safety of the audience that way. A person thoroughly acquainted with the place, and having a clear way, unable to escape from an empty house, has perished in the flames when a fire broke out.

It is in the means of instantly quenching a fire, that we must look for safety. Hitherto all means such as iron screens, extincteurs, firemen (so called) in the house, have proved miserable failures. The work requires to be done at a moment's notice by some one free himself from personal danger, and, consequently, panic, or the turmoil of a surrounding panic. In the first place, there ought to be water-pipes to shower a flood of water upon any or every part of the house on the turning of one or more levers; these should be in a chamber, from the window of which every part of the house is discernible, without any direct communication with it. This chamber should have a separate means of exit, so that the man in charge shall have no reason to be anxious for his personal safety.

The man ought to be a tried member of the Fire Brigade, appointed to the post by the police authorities, and altogether independent of the manager of the theatre. He ought to be visited by the inspector of police for the district, who ought to report any irregularity.

The apparatus ought to be frequently tested by the police, when, of course, hose would be attached to carry the water off without injury to the house.

The lessees, if taxed for the maintenance of such a system, and therefore disposed to grumble, may remember that a fear of fire is never altogether absent from the minds of the audience, and that possibly such a fear may keep many from attending a theatre.

G. Chapman.

BODY-SNATCHING.

Sir,—The recent startling revival, on both sides of the Atlantic,—in the United States and Scotland,—of what was presumably a lost art,—that of the resurrection-man,—may permit the suggestion to some that wherever such distressful disturbance, from motives of revenge or motives of cupidity, is in any degree presumable, the simple, short, and inexpensive expedient of lining the grave all round with a few feet of cement concrete (rapidly hardening like rock, unaffected by moisture, and enduring as embalment) would at least so protract the nefarious and ghastly operation as to render prevention a matter of certainty in precise ratio to the thickness of the enclosure.

E. L. Tarbuck.

ANTHRACITE.

Sir,—May we be allowed to call attention to a portion of your leader last week *re* anthracite coal for domestic purposes, which appears to have attracted considerable attention, and has been quoted in several of the daily papers?

We would point out that all coals give off carbonic acid gas, and that anthracite requires a good draught to burn at all; this draught is more than sufficient to carry off the carbonic acid and other gases that may be generated; in other words, carbonic acid gas cannot be produced from anthracite coal without sufficient draught to carry it off.

Your description corresponding with one exhibits, we have had numerous inquiries at the Exhibition; these we are easily able to satisfy, but as your statement, unqualified, is likely to mislead the general public, we would ask you to insert this letter.

Anthracite coals are burnt almost entirely in Carmarthenshire and Pembrokeshire.

Arcnd. Smith & Stevens.

CORNER BUILDINGS AND THE LINE OF FRONT.

Sec. 75, Metropolitan Local Management Amendment Act, 1862, as applied to Corner Buildings.)

Sir,—I have read the paragraph on this subject in the *Builder* (p. 724), with the greatest interest, and while I entirely agree with what appears to me to be the commonsense view there expressed, I have reason to remember that this reading of the Act is certainly not universally accepted.

As Surveyor to the "Rolls Estate," I have frequently had much difficulty and annoyance in connexion with this question; and as my experience may possibly be of interest to your readers, I venture to state a case which appears to me to be much to the point.

In 1870 I let a corner piece of ground on a building lease, this ground having a frontage in the St. James's-road (Bermondsey), and a side frontage in the Rolls-road. The side frontage of the opposite house extended to the footpath, and the general line of frontage in this road is very irregular, although the houses immediately adjoining were set back 10 ft. No question arose as to the front building line in the St. James's-road, but the Bermondsey Vestry took proceedings to compel the builder to set back the side frontage to a line, fixed by the Architect of the Metropolitan Board on the application of the Vestry, extending from the side frontage of the house on the opposite side of the St. James's-road (forming the angle of the Rolls-road) to the houses adjoining the plot in question in the Rolls-road, thus setting back the side frontage from 5 ft. 6 in. at the St. James's-road end to 9 ft. 2 in. at the back. The freeholder spared neither trouble nor expense in contesting the question before the magistrates, but the decision was given against him, and, in pursuance of the order then made, the Vestry demolished so much of the house as was erected in front of the frontage line as laid down by the Metropolitan Board.

The magistrate refused to grant a case, and the rule *nisi* granted by the Court of Queen's Bench, calling upon the magistrate and the Vestry to show cause why the former should not state a case, was argued, and discharged with costs against the applicant.

The house frontage was reduced from 20 ft. to 14 ft. 6 in., and the freeholder was obliged to purchase the lessee's interest, as he could not allow him to be the sufferer.

A more recent case (1879) bearing upon this question is that of the Prince Imperial public-house, in the Rotherhithe New-road, the side frontage of which, in the Rolls-road, the Bermondsey Vestry compelled the freeholder to keep back 5 ft. from the footpath.

R. J. Dickins.

PUMPING WATER FROM ADJOINING OWNERS' PREMISES.

KNIGHT *v.* MOWLEM.

This was an ex-parte application of the plaintiffs, before Mr. Justice Chitty in the Chancery Division, for an injunction to restrain the defendants from pumping water to the detriment of plaintiffs' buildings.

Messrs. John Knight & Sons, the well-known soap manufacturers, had erected at the cost of 50,000*l.*, large soap works at Silvertown. Within the last ten days Messrs. Mowlem, the large contractors, who are about to erect some buildings immediately adjoining, have been preparing the foundations, which they are draining by means of powerful steam pumps, which are kept going night and day, Sundays included. The immediate foundation is clay, but the sub-soil is peat. The effect of the pumping is that the water is not only drawn from the defendants' foundations, but from the plaintiffs' as well, and a dangerous settlement is taking place, and the "stuff house" has already given way. Application was made to the defendants to cease their operations, but this they declined to do. In anticipation, therefore, of still further danger being incurred if the pumping was continued till Monday, the plaintiffs applied for an injunction to compel the instant stopping of the pumping.

Mr. Eimer, Q.C., and Mr. Oswald appeared for the plaintiffs.

Mr. Justice Chitty, on the authority of the case of Chasemore *v.* Richards, which decided that where water was not running in known channels it might be abstracted, refused to grant an injunction *ex parte*, but gave leave to serve notice of motion on the defendants for Tuesday last.

THE MONUMENTS IN ST. PAUL'S CATHEDRAL.

Considering the large sum about to be spent upon what some consider an unnecessary addition to the bells already existing in the Cathedral, may I not ask who is responsible for the present disgraceful condition of the noble and beautiful marble monuments there? I have personally witnessed the state these beautiful productions, from some of our finest sculptors, have been in now for the last ten or twelve months. So thickly are they covered over with dirt and dust that it would take a considerable amount of time and labour to restore them to anything like the natural colour of the marble.

R. P.

Fall of Houses at Limehouse.—About a quarter to five o'clock on Tuesday evening two houses, Nos. 20 and 22, North-street, Limehouse, which have been for a considerable time uninhabited, owing, it is said, to their dilapidated condition, suddenly fell, with a loud crash, into the street. It is stated that some children were playing inside the houses, and were also looking for firewood, when one of their number began to pull at one of the window-sashes. This suddenly gave way, and the walls and ceilings followed, burying the children and nearly suffocating them with the clouds of dust. Six children were injured by the fall of the buildings.

CHURCH-BUILDING NEWS.

Warminster.—Christ Church, which has been closed for some weeks for extensive alterations, was re-opened a few days since. The west gallery, which formerly blocked up what were considered two of the best windows of the church, has been pulled down, and the old lobbies beneath have also been taken away. The ceiling has been removed, leaving only a lofty open-timbered roof, and adding greatly to the general effect of the building. Two rows of Bath-stone arcades have been thrown up to support the edifice, making a lofty and well-proportioned nave with aisles. The chancel-arch has been elevated and embellished. The decoration of the walls is not yet complete. A sage-green dado, 6 ft. high, runs round the walls, and will be surmounted with further and more elaborate embellishments. Mr. Vialls, of London, has been the architect, and Mr. J. Gaisford, of Warminster, the contractor; Mr. John Ponton having been the sub-contractor for masonry, &c., and Mr. Grant for plastering and colouring. The carved work in wood and stone was done by Mr. Harry Hems. The beams of the roof were stained by Mr. Luke, and the seats by Mr. Edwards. Mr. R. R. White executed the gas-fitting. The church now contains about 750 sittings, of which 250, in the aisles, are set apart for children.

Edinburgh.—North Merchiston Established Church, an important addition to the ecclesiastical edifices of Edinburgh, has made rapid progress during the past six months. The building occupies a site on the Slateford-road, opposite the new Dalry Cemetery, and will accommodate 1,000 persons without galleries. It is in the Gothic style of the thirteenth century. The plan consists of a nave and side aisles, with a small transept for organ at the east end of the north aisle, adjoining which is the vestry. The principal entrance is at the other end under the tower, the base of which forms the porch, while to the west of this is placed a session-house, a hall for prayer-meetings, &c., and a beadle's house, so that the total length of the buildings fronting the Slateford-road is 197 ft. The width of the church inside is 62 ft. 6 in., and the height from the floor to the top of the ridge is 66 ft. The tower is nearly 30 ft. square, and rises to a height of 134 ft. 6 in. above the road. The richest part of the exterior is the east gable. This has massive buttresses at the angles, between which the whole space is occupied by three tall lancet windows, having clustered shafts between them and arcading on each side, while between the window-sills and the base course an arcade with clustered shafts extends across the gable. The architect of the building is Mr. John Honeyman, of Glasgow.

Letterston (Pembrokeshire).—This church was re-opened by the Archdeacon of St. David's, on the 30th ult., after considerable alterations and improvements. It was badly rebuilt some thirty years back, and nothing could be colder,—more comfortless,—than the interior prior to the execution of the recent works. The roofs have been boarded and otherwise improved, and encaustic tiles substituted for the damp stone flagging. New open pitch-pine seats have been provided in the nave, and stalls in the chancel, with reading-desks, communion-table, and altar-railing. A commodious vestry has been added, one of Porritt's warm-air apparatuses supplied, and new chancel-arch, windows, and doorways throughout are substituted. More, however, requires still to be done when funds permit. The work has been carried out by local tradesmen, from the plans and under the superintendence of Mr. E. H. Lingen-Barker, architect.

DISSENTING CHURCH-BUILDING NEWS.

Lossiemouth.—The new United Presbyterian Church, at Lossiemouth, N.B., which stands facing the sea on the higher side of the square of Branderburgh, has been opened for worship. The building is in the Gothic style, and is entirely of freestone. The principal architectural feature of the building is the front gable, surmounted by the belfry, rising to a height of about 80 ft. Each of the front angles of the building is supported by a double buttress, and on each side of the large doorway there is also a buttress, all of them surmounted by carved finials. Above the doorway there is a large window, something after the style of the Alpha window of the Elgin Cathedral. The platform at the further end of the church is ascended by a staircase on either side, enclosed by iron railings. The front of the platform is of Gothic panelling, stained and varnished, like the front of the gallery, all round. Below, and immediately in front of the platform, is a commodious choir seat, only slightly raised from the area of the church. The gallery extends all along the sides and the gable of the church in front of the platform, and is supported by iron pillars. To the rear of the church are the vestry, and a large meeting-hall. The cost of the building has been 2,020*l.* The architects are Messrs. Matthews & Mackenzies, Elgin. The contractors were:—Mason, Mr. Alexander, Buckie; carpenter, Mr. Kenneth M'Kenzie, Lossiemouth; slater, Mr. Findlay, Elgin; plumber, Mr. Gordon, Elgin; plasterer, Messrs. Brown & Munro, Elgin; painter and glazier, Mr. Ellis, Grantown; ironwork, Messrs. Seller & Co., Elgin; while Mr. James Smart was inspector of works.

Miscellanea.

Too-attractive Shop Windows. — The recent decision of the Court of Queen's Bench in the case of Manchester shopkeepers exposes an injustice which we do not think will be silently submitted to by a class which is able to make its voice heard, and which possesses not a little influence. The dealers in question were each mulcted in a fine of forty shillings, which was a trifle; but the sting of the sentence lies in the order of the judge, who bound them under a penalty of 500*l.* not to repeat the offence. In other words, he constrained them from carrying on legitimate trading in a way which has always been looked upon as being sanctioned by law. But such appears not to be the case. The local authorities, which happen to be the Manchester Corporation, by virtue of some antiquated regulations, thought fit to prosecute the dealers for seeking to arrest the attention of their customers by exhibiting in their windows attractive photographs, &c. There appears to have been nothing morally wrong in the display, the only offence being, according to the existing law, the assembling of large crowds. It is thought that these crowds might have been dispersed by proper police supervision; but instead of using the powers thus possessed, the authorities prosecuted, and successfully prosecuted, the offenders for causing an obstruction. We have no hesitation in saying that, if the law which sanctions such persecution is statute law, the sooner it is abolished or amended, the better for the community.—*Iron.*

Explosion of a Street Lamp.—At Stratford-on-Avon, on the 2nd inst., an alarming explosion of gas took place in Warwick-road, resulting in the complete destruction of the large public lamp which stood in the open space near the Red Horse bowling-green. A slight escape of gas was suspected, the lights of the lamp not being so full as usual, and in order the better to discover its whereabouts, one of the corporation gasmen was sent to make an examination of the lamp soon after the extra pressure was put on at the works. The man obtained a ladder, and opening the globe of the lamp examined the burners. The escape was considered only trifling, and thinking it was in the vicinity of the burners, new ones having lately been put in, the gasman applied a light underneath. Immediately afterwards there was a terrific explosion, the lamp being shattered, and the whole fell with a tremendous crash to the ground. The masonry was upheaved, and the paving stones around torn up and displaced. The standard was hollow, and it is supposed that a slight leakage in the supply-pipe had filled the interior of it with a mixture of gas and atmospheric air, producing the explosion when a light was applied.

Appointment.—At a meeting of the Leeds Town Council, held last week, it was decided to instruct Mr. W. Hoffman Wood, building and quantity surveyor, of Leeds, to take off the quantities for all new buildings erected by the Corporation of Leeds.

Railway History.—The Exeter newspapers for the 13th inst. contain the following obituary announcement:—December 11, at Mount Vernon, Magdalen-road, Exeter, Elizabeth Gray, aged 66 years, eldest daughter of the late Thomas Gray, the author and projector of the railway system.

Bodmin Asylum, Cornwall. — The important additions to Bodmin Asylum, which are about to be undertaken, will supply additional accommodation for 170 pauper patients. The main building will be two stories in height, and will exceed 250 ft. in length. It will contain large day-rooms and dormitories, with a proper proportion of single rooms, approached from the corridors, which will be the entire length of the building and 10 ft. in width. At one end of the structure will be an epileptic ward, shut off from the rest of the establishment, and constructed on the most approved modern principles. Attendants' rooms will be in close proximity. In central positions there will be spurs thrown out for bath and dressing rooms, lavatories, and closets. All the drains will be extra-mural and ventilated. Detached for the most part from the main building,—but connected with it and the last erected asylum block by corridors,—will be a hall to dine about 240 patients, with kitchens and offices in the rear. In front of this detached building will be the apartments of the assistant medical officers. The building will be erected and faced with an excellent freestone, quarried on the asylum grounds, and now being raised by the patients. The plans, which have been approved by the Commissioners in Lunacy and the Home Secretary, have been prepared by Mr. Norman and Messrs. Hine & Odgers, the joint architects (Plymouth) whose designs for the Carew-buildings (for private patients) were accepted in competition about eighteen years ago, and whose professional services have since been retained by the visiting justices. The new buildings will be publicly tendered for early in the coming year.

House and Police Telegraphs. — We understand a complete system of telegraphs has been introduced in the metropolis, between the nearest police or other stations and mansions, banks, public offices, and places of business of all kinds where valuables or valuable securities are kept. By this system when a house is shut up for the night, and in communication with the nearest police or other station, no one can enter the premises without giving instant notice of the same at the station. The name and number of the street being shown as distinctly to the man on duty at the station, as if he were standing before the house itself, and if necessary the exact room or part of the building wherein the attempted burglary is being made can also be indicated. The marvellous assistance which this system affords cannot fail to be recognised in the proper quarter, and we should say it only requires to be known in order to be taken up by all business men and gentlemen having valuable property at their houses, which offer inducements to the burglar and robber. This safeguard is the invention of Messrs. Francis & Co., the well-known telegraph engineers, of Hatton-garden.

Death of Sir Antonio Brady.—We regret to see the announcement of the death of Sir Antonio Brady, whose career of usefulness in the service of the public was of two kinds,—official and general; but his labours have assumed a greater prominence since he ceased to serve the State in an official capacity. He assisted in preserving a considerable portion of Victoria Park from the inroads of bricks and mortar; and he subsequently threw all his energy into the movement for preserving Epping Forest to the use of the public. He was announced to read a paper on Wednesday, at the Brighton Health Congress, on the prevention of smoke in fireplaces.

Borough Engineer, Newcastle.—At the last meeting of the Town Council the business was the election of a Borough Engineer and Town Surveyor, the following being a list of the selected candidates and the amount of salary asked for by each:—Garrett J. Barry, Liverpool, in private practice, 800*l.*; Ernest Benedict, resident engineer, London and South-Western Railway, 900*l.*; J. Bartwright, Borough Engineer of Bury, 700*l.*; R. Davidson, Sheffield, Borough Surveyor and Engineer of Sheffield, 1,000*l.*; James Hart, St. Helen's, Borough Engineer and Surveyor of St. Helen's, 750*l.*; Albert Latham, Margate, Borough Engineer and Surveyor of Margate, 900*l.*; W. George Laws, Newcastle, in private practice, 600*l.* Ultimately Mr. Laws was elected.

Value of Land in the City.—No 50, Eastcheap, containing 1,685 superficial feet, was let by auction by Messrs. Philip Tuckett & Co., of 10A, Old Broad-street, on Wednesday last, on a building-lease for eighty years, at a ground-rent of 1,200*l.* per annum.

Prize-gainers, Royal Academy.—The principal prize-winners were Mr. Samuel Melton Fisher, Gold Medals and Travelling Studentship (200*l.*), for historical painting; Mr. Bryan Hook, Turner Gold Medal and Scholarship (50*l.*), for landscape; Mr. Oscar Alexander Junck, Gold Medal and Travelling Studentship (200*l.*), for composition in sculpture; Mr. James Howard Ince, Gold Medal and Travelling Studentship (200*l.*), for a design in architecture; Miss Margaret Hickson, the Creswick Prize (30*l.*), for landscape; Mr. Henry Marriott Paget, prize (40*l.*), for a design for the decoration of a portion of a public building; Mr. Maurice W. Griffenhagen, first Armitage Prize (30*l.*); Mr. T. C. Sirrell Benham, first prize (50*l.*), for a set of six drawings of a figure from the life; and the following silver medallists, who stood first in various competitions:—Mr. Horace B. Fisher (two medals), Mr. John Ernest Breun (two medals), Mr. Bernard Evans Ward, Miss Theodora Joan Noyes (medal and prize), Miss Susan Ruth Canton, Mr. David John Wade (medal and first prize), and Mr. W. B. Bassett-Smith.

The Society of Engineers.—The twenty-seventh annual general meeting of the members of the Society of Engineers was held on Monday evening last, the 12th inst., in the Society's Hall, Victoria-street, Westminster. The chair was occupied by Mr. Jabez Church, vice-president. The following gentlemen were balloted for and duly elected as council and officers for the ensuing year, viz.:—As president, Mr. Jabez Church; as vice-presidents, Mr. F. E. Duckham, Mr. Arthur Rigg, and Mr. W. Schönheyder; as ordinary members of council, Mr. R. Berridge, Mr. S. Cutler, Mr. C. Gandon, Mr. C. J. Light, Mr. Perry F. Nursey, Mr. Heber Duckham, Mr. A. F. Phillips, and Mr. Arthur T. Walmisley, the three last-named gentlemen being new members of the council; as honorary secretary and treasurer, Mr. Alfred Williams; and, as auditor, Mr. W. H. Bennett.

Ashburnham House.—The following memorial, signed by Sir Henry Cole, Mr. William Morris, Mr. H. S. Milman (director of the Society of Antiquaries), Mr. J. L. Pearson, R.A. (architect at Westminster Abbey), Mr. F. C. Penrose, and others, was presented to the Governors of Westminster School by the Dean of Westminster: "On behalf of a meeting of gentlemen interested in the preservation of Ashburnham House and of the ancient remains on its site, and earnestly desirous that no encroachment should be made on the ground closely adjacent to the Abbey Church of Westminster, we venture to request that the Governing Body of Westminster School will not come to any decision adverse to the proposal about to be made by the Dean and Chapter, until they have received and heard a deputation from such meeting on the subject."

Ventilation.—Since the last meeting of the United Grand Lodge, important improvements have been made in the ventilation of the Temple, the Board-room, the De Grey, the Zetland, and the whole of the rooms in which the various lodges are held. The ventilation improvement works have been carried out by the Sanitary Engineering and Ventilation Company, of Victoria-street, Westminster, who have applied their "Imperial" ventilating-tubes and "Imperial" exhaust ventilators, under the direction of Bro. John Gibson, F.R.I.B.A. We are told that it has given general satisfaction.

Cost of Wood Paving in Chelsea.—At the last meeting of the Chelsea Vestry, the Surveyor presented a report showing that the total cost of the Fulham-road wood paving from Thistle-grove to Stamford-bridge, was as follows:—Total amount expended for labour, plant, materials, new gullies, and sundry works, 5,691*l.* 12*s.* 11*d.*; area of work executed, 10,573 yards superficial; the actual *net cost* of the wood pavement (after deducting the new gullies, and the value of the old materials carted away) amounts to 9*s.* 5*d.* per yard superficial.

Selenitic Cement. — The *Boston* (Mass.) *Journal* of November 23rd states that the American company for carrying out General Scott's well-known patent has received a gold medal at the Fourteenth Triennial Exhibition of the Massachusetts Charitable Mechanic Association at Boston.

Bagshot Church Competition. — H.R.H. the Duke of Connaught has been pleased to accept the design submitted by Messrs. Bromilow & Cheers, of Liverpool, for his church to be erected in Bagshot Park.

The Royal Academy.—At a general assembly held on the 8th inst., Mr. Peter Graham, Associate, was elected a full Academician. At the close of the President's address to the students on the 10th inst., elsewhere noticed, the students adjourned to the Antique School, and there presented the Keeper with a testimonial, in the shape of three silver salvers, and an address, which ran as follows:—"To F. R. Pickersgill, Esq., R.A., Keeper of the Royal Academy of Arts.—Sir, We, the past and present students of the Royal Academy of Arts, desire most respectfully to offer this testimonial to you, as a mark of our full appreciation of your valuable teaching, and the unvarying kindness that you have always shown to us as students of the school during the time you have so worthily held the office of Keeper. We sincerely trust that you may long remain among us, and we rest assured that both we and those that follow will alike reap the benefits of your valuable counsel and advice for many years to come."

A Norwegian Peasant, rejoicing in the sonorous name of Ola Samsonsön Midnäs, has, it is said, invented a new system of propelling vessels which dispenses with manual labour, sails, or steam power. The inventor has constructed almost without assistance a small vessel, which, according to a recently published account, was at Bergen. The general principle of the system is said to be the utilisation of the column of water which the weight of the vessel forces through an opening made to receive it, but the details have, it is stated, been kept a secret by the inventor.

Testing Traps.—We have received from Mr. Emptage a reply to Mr. Davies, but do not think it necessary to print it. We must also decline to print five other letters on the same subject; the affair has degenerated into a squabble.

TENDERS

For the erection of proposed new school at Binstead-road, Buckland, Portsmouth, for the Portsmouth School Board. Mr. A. H. Bone, architect. Quantities supplied by Mr. H. P. Foster:—

G. Longley, Worth, Sussex	£9,979	0	0
G. Barbridge, Portsmouth	9,142	0	0
Patman & Fotheringham, London	8,873	0	0
T. B. Hayter, Portsmouth	8,873	0	0
T. C. Cooper, Portsmouth	8,830	0	0
H. & W. Evans, Portsmouth	8,470	0	0
T. W. Earwaker, Portsmouth	8,400	0	0
C. Boulton & Son, Portsmouth	8,081	9	0
D. W. Lewis, Portsmouth	7,993	12	0
J. Crook, Southampton (accepted)	7,747	0	0

For three new shop-fronts, Sanford-lane, Stoke Newington, for the Incorporated Society of Licensed Victuallers. Mr. R. J. Newton, architect:—

Drew	£213	0	0
Finegar	195	0	0
Wood	175	0	0
Cook	173	0	0
Crabtree	155	0	0
Walker	145	0	0
Pickersgill (accepted)	140	0	0

Wood Fencing.
Wood (accepted).

For making-up of Alexandra-road, for Hornsey Local Board. Mr. T. de Courcy Meade, surveyor:—

John Bell	£712	4	6
Ford & Everett	699	0	0
McDowell & Dawson	665	0	0
A. Walker	659	10	6
Dammore	644	0	0
Strachan & Co.	642	0	0
Bloomfield	633	0	0
McKenzie, Williams, & Co., Tower-chambers, Moorgate (accepted)	588	0	0
Peill & Sons	579	0	0
Pizzey	548	0	0

For alterations and additions at Carr View, Sleights, near Whitby, for Mr. D. G. Pinkney. Mr. Edward H. Smales, architect. Quantities by Mr. H. T. Neilson, Darlington:—

Watson Bros., Darlington	£2,517	17	0
Wm. Robinson, Whitby	2,163	4	0
J. White, Whitby	2,130	19	0
J. Gladstone, Whitby	2,076	17	0
Langdale & Sons, Whitby	1,885	0	0

For the erection of new offices, bonded stores, &c., Deptford, for Mr. Alfred Kirby. Mr. Thos. Dinwiddy, architect:—

Glas'in	£3,198	0	0
Jarrard	2,949	0	0
Redman (accepted)	2,875	0	0

For a pair of houses, Greenwich, for Mr. James Harvey. Mr. Thos. Dinwiddy, architect.—

Bridell (accepted)	£1,050	0	0

For additions to the South London Brewery for Messrs. R. & H. Jenner & Sons. Mr. Edwin T. Hall, architect. Quantities by Messrs. Evans & Deacon:—

H. S. Foster	£3,990	0	0
T. E. Julian & Co.	3,380	0	0
Howard & Dorrell	3,383	0	0
W. Bangs & Co.	3,230	0	0
H. Baguley	3,208	0	0
B. E. Nightingale	3,140	0	0
T. H. Adamson & Sons (accepted)	3,095	0	0
H. Hart	3,085	0	0

For new Board Schools, Wood-street, Woolwich. Mr. H. R. Robson, architect. Quantities by Mr. W. H. Barber:—

Peto Bros.	£14,179 0 0
Wall Bros.	13,907 0 0
Atherton & Latta	13,832 0 0
E. Lawrence	13,749 0 0
J. Grover	13,694 0 0
W. Oldrey	13,636 0 0
J. T. Chappell	13,594 0 0
F. & F. J. Wood	13,592 0 0
T. Boyce	13,479 0 0
B. E. Nightingale	13,473 0 0
C. Cox	13,353 0 0
F. Johnson	13,285 0 0
S. J. Jerrard	13,247 0 0
Stimpson & Co.	13,149 0 0
Kirk & Randall	12,945 0 0

For the enlargement of Board Schools, at Sleaford-street, Battersea. Mr. R. R. Robson, architect. Quantities by Messrs. Northcroft, Son, & Neighbour:—

T. Boyce	£7,940 0 0
J. D. Hobson	7,694 0 0
W. Downs	7,373 0 0
W. Shurmur	6,993 0 0
Atherton & Latta	6,970 0 0
J. Marsland	6,885 0 0
B. E. Nightingale	6,825 0 0
Higgs & Hill	6,784 0 0
W. Oldrey	6,632 0 0
Lathey Bros.	6,462 0 0

For new warehouses, Harrow-road, for Messrs. Lilley & Skinner. Mr. J. W. Chapman, architect. Quantities by Messrs. Goodchild & Son:—

	Time.	
Mark	6 months...	£6,410 0 0
Sawyer	6 ,, ...	6,240 0 0
Rider & Son	6 ,, ...	5,988 0 0
Higgs & Hill	6 ,, ...	5,980 0 0
W. Oldrey	4 ,, ...	5,894 0 0
Hoare	Nil. ...	5,893 0 0
Holland & Haunen	8 months...	5,743 0 0
Brass	5½ ,, ...	5,733 0 0
Woodward	3 ,, ...	5,700 0 0
Ashby Bros. (to-date)	5 ,, ...	5,385 0 0

For conversion of No. 62, Atlantic-road, Brixton, into a shop. Mr. Cruwys, architect:—

Macey, Brixton	£191 0 0
Hogan, Dulwich	166 0 0
Lambert, Pimlico (accepted)	123 0 0

For alterations to the Cock and Bottle public-house, Lambeth-walk. Mr. Cruwys, architect:—

Barman, Kennington	£232 0 0
Beale, Westminster (accepted)	173 0 0

For construction of the London-road sewer, Southend-on-Sea, for the Local Board. Mr. Arthur Clayton, surveyor:—

Wilkes & Co., Devonshire-square, Bishopsgate (accepted).

For the erection of school buildings, &c., at the Sculcoates Union Workhouse, Hull. Mr. Samuel Musgrave, architect:—

Pearson, Hull	£13,430 1 8
Bentley & Burn, Leeds	13,200 0 0
Grassby, Hull	12,406 0 0
Sergeant, Hull	12,190 0 0
Habbershaw & Son, Hull	12,023 0 0
Wharram, Hull	11,672 0 0
Coulson, Hull	11,603 0 0
Jackson Bros., Goole	11,500 0 0
Harper, Hull	11,138 16 0
Rockney & Liggins, Hull	11,117 10 0
Brown, Hull	11,412 0 0
Jackson & Son, Hull	11,440 0 0
Stanley, Hull	11,380 0 0
Goates, Hull	11,275 0 0
Drury, Hull	11,166 0 0
Executors of late T. Southern, Hull	11,058 0 0
Musgrave, Hull	10,987 0 0
Stamp Bros., Barton	10,513 0 0

For pair of cottages, Uphill, Somerset, for Mr. Henry Shaw:—

S. F. Harvey & Co. (accepted) £206 0 0

For completion of house at Montpelier, Weston-super-Mare, for Messrs. Davies:—

Fear	£184 5 0
Addicott	159 5 0
S. F. Harvey & Co.	159 0 0

For Grange Bridge, Rhyl, for Mr. Joseph Evans, London and North-Western Railway Company, and the Rhyl Improvement Commissioners, jointly. Mr. B. Nelson, engineer. Quantities by the engineer:—

Contract No. 1.

Thos. Flint, West Bromwich	£1,490 11 10
Handyside & Co., Derby	1,394 3 9
Saml. Woodall, Dudley (accepted)	1,183 10 0

Contract No. 2.

Geo. Smith & Co., Southport	1,020 0 0
Bridge & Roofing Co., Darlaston	993 4 8
Saml. Woodall, Dudley (accepted)	908 10 0

Contract No. 3.

Roberts, Rhyl	4,755 0 0
Vaughan, Pontefract, Yorks	3,689 16 6
Whitley, Rhyl	3,343 16 2
Jones & Owen, Llanddulno	3,516 0 0
J. B. Squires, Liverpool	3,187 10 0
Geo. Smith & Co., Southport	3,024 0 0
Braddock & Mathews,* Southport	2,934 0 0

* Accepted.

Contract No. 4.—Approaches.

Robert Jeffreys, Colwyn Bay	£2,783 11 9
Edwards, Rhyl	2,465 0 0
Geo. Smith & Co., Southport	2,460 0 0
Braddock & Mathews,* Southport	2,460 0 0

* Accepted.

For road and drainage works, Elwy Hall Estate, Rhyl, for Mr. Joseph Evans. Mr. B. Nelson, engineer. Quantities by the engineer:—

Braddock & Mathews,* Southport .. £2,800 17 3

* Accepted.

For town-hall offices, Penmaenmawr. Mr. B. Nelson, architect. Quantities by the architect:—

Collins & Son, Warrington	£2,900 0 0
Smith & Pilkington, Pier Works, Llanddulno	2,450 0 0
E. Hughes, Glan Conway	2,276 0 0
Abel Roberts, Colwyn Bay	2,247 0 0
John Hughes, Llanddulno	2,190 0 0
Wm. Prichard,* Llanddulno	2,165 10 0

* Accepted.

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All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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The Builder.

VOL. XLI. No. 2029. SATURDAY, DECEMBER 24, 1881

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The late G. E. Street, R.A.



ALL our readers will have heard, and all will have heard with great regret, of the sudden and unexpected death of Mr. Street, at the comparatively early age of fifty-seven, and just when he seemed to be at the zenith of his professional success, and was looking forward soon to witness the completion of the greatest work of his life, and the most important English building since the Houses of Parliament. Unexpected his death may be called; for though he had been very ill a short time previously, and the necessity for complete rest and relief from responsibility for a considerable time had become quite obvious as a condition of his recovery, we had had the assurance since then of his friends' belief in his having rallied from his previous attack, and in the prospect of his complete recovery with time, rest, and the change of climate which he had decided on. But this was not to be.

He had experienced a stroke of paralysis on November the 19th, which had given the first warning that his powers had been overtaxed. This was succeeded on Thursday, the 15th of this month, by a more serious recurrence of the same calamity, from the effects of which he did not recover, and which terminated in his decease at his house in Cavendish-place, on the night of Sunday last. His plans had been laid for leaving England for Egypt, in search of rest and recruited health, on the Friday before the day which proved to be his last.

Mr. Street was born at Woodford, in Essex, June 20th, 1824, the third son of his parents, Thomas and Mary Anne Street. In March, 1841, he commenced his professional studies as articled pupil to Mr. Owen B. Carter, architect, of Winchester. In April, 1844, he entered the celebrated studio of Gothic architecture, as it might well be called, in Spring-gardens, and soon drew the attention of Scott as an assistant of unusual ability and promise, and was selected to give special assistance to his principal in the preparation of some of his most important designs. Sir G. Scott gave special testimony in regard to the high value he then set on Mr. Street's assistance, on the occasion of the presentation of the Institute Gold Medal to the latter a few years ago. In 1848 he left Spring-gardens to enter practice on his own account at Wantage. On his appointment as architect to the Oxford Diocesan Commissioners in 1858, he removed his residence to Oxford, and in the same year was married to Mariquita, the daughter of Mr. Robert Procter, of Geys House, near Maidenhead. In 1856 he removed to London, settling, in the first instance, at 33, Montague-place; and in 1863 removed to 5, Russell-square, where he practised till 1870, thus occupying for a considerable time a neighbourhood which has been a favourite one with architects and other artists. Thence he removed to the house which he inhabited till his death, at 14, Cavendish-place. In 1876, having lost his first wife some time previously, he married again, his second wife being Jessie Mary Anne, daughter of Mr. William Holland, whom he had the great and trying misfortune to lose two months after their marriage, and, if we remember rightly, while they were still on their wedding tour,—a calamity which, it may be feared, laid the first foundation of the ultimate breaking up of his formerly robust health and strength. Some other dates in his professional career may also be noted here. It was in 1868 that he received the appointment of architect to the Law Courts, after the great professional competition which excited so much attention at the time, both within and without the ranks of the specially architectural world. Two years previously, in 1866, he had been elected an Associate of the Royal Academy, and in 1871 was elected to its full privileges as R.A. On the death of Mr. E. M. Barry, now nearly two years ago, he succeeded that gentleman as Treasurer of the Academy and as its Professor of Architecture, although he was only once or twice spoken of in our columns as "Professor" Street, this being his own desire, as expressed in a letter to us, on the ground that he did not wish the title to stick to him. He had filled the post of Vice-President at the Institute of Architects, at the meetings of which, however, he for a long period did not take any prominent place, partly, it may be presumed, from his constant professional employment and consequent want of time, and partly, we believe we shall not be incorrect in saying, from the fact that he did not find the architectural tone and tendencies of that body altogether what he was in sympathy with. On the institution there of the new arrangements for regulating the succession to the Presidential chair, he, in fact, withdrew from the Council and from his technical right to the succession, thinking, as we also did, that the policy thus instituted was a mistake. The feeling, however, of a considerable number of members was that the architect who had confessedly attained the most eminent position in the profession should be solicited to preside over the leading professional body. After a rather strenuous skirmish between his supporters and those of the new code, which will be fresh in the memory of all concerned, and which in some of its features we think was to be deplored, he was elected by a majority, and read his opening address as President at the first meeting of the present session, which was listened to with much sympathy by one of the most crowded professional audiences ever assembled in the rooms of the Institute. Without, as we have implied, entirely sympathising with all that was done and said on the occasion of what may be called the Battle of the Chair, we were of opinion that his election was the right step to take in the main, that it was due to the remarkable position he had achieved, and that it was calculated to infuse new life into the proceedings of the Institute and give a fresh impetus to it; and many even of those who took the opposite side at the moment will feel that his death at this juncture is a heavy loss to the Institute of Architects.

The place which Mr. Street filled in connexion with the modern Gothic revival was one which was only second to that of Sir G. G. Scott. His earliest works were in Cornwall, at Biscovey and other places in the county, and Hadley Church, Essex, may also be mentioned, which was built in 1844. Buildings by him are now to be found, it may be said, all over England, as well as in Scotland and Ireland, and in many parts of the Continent. Churches from his design are in existence in Constantinople, Rome, Genoa, Lausanne, Vevay, and Mürren. One of his churches in Rome was for the American congregation there, for with Americans his reputation stood very high indeed, and another church from his designs for the American colony in Paris (no insignificant one), is just now being commenced. We append at the close of this article a list of his principal works in various localities. We may add here the following list of works by him of which illustrations will be found in various volumes of this journal:—

Memorial Church at Constantinople, second premiated design, vol. xv., pp. 162, 183.
Cathedral at Lille, second premiated design, vol. xvi., p. 81.
Church, Parsonage-house, and Schools (All Saints'), Boyne-hill, Berks, vol. xviii., p. 769.
Church of St. James-the-Less, Westminster: exterior vol. xix., p. 411; interior, vol. xx., p. 187.
Monument to Major Hodson, Lichfield Cathedral, vol. xx., p. 45.
Law Courts, competition design, vol. xxv., pp. 113, 645.
Law Courts, plan of Court Floor, as determined for execution, vol. xxviii., p. 666.
Church, St. Peter's, Bournemouth, vol. xxviii., p. 1,027.
Law Courts, Strand front, vol. xxix., p. 947.
Reredos, Carlisle Cathedral, vol. xxxii., p. 1,011.
Church, Episcopal American, Rome, vol. xxxiv., p. 1,096.
New nave, Bristol Cathedral, vol. xxxvi., p. 14.
Bench-ends, Dunster Church, vol. xxxvi., p. 726.
Reredos, York Minster, vol. xxxviii., p. 357.

One of the first buildings by Mr. Street which was much talked of and contributed to bring his name as an architect into general repute was the church of St. James the Less, a comparatively small work, which evinced the results of much study of detail, and perhaps attracted attention the more on account of its exhibiting hints taken from the study of Italian brick architecture into which Mr. Street had gone largely some little time before, when on the tour of which the publication of his work on "Brick and Marble Architecture in Italy" was one of the results. There were not wanting, indeed, those who objected to the infusion into English church architecture of features borrowed from or suggested by Italian Gothic, certainly a more mixed and less complete style, as Mr. Street himself observed in his book, than that of Gothic north of the Alps. Mr. Street, however, held

always in theory, and carried out in practice, the idea that all forms of Gothic architecture were worth study, and contributed valuable suggestions to the architect, and it was about this time, and probably in reference to some of these criticisms that he addressed to the conductor of this journal a letter (dated January 1st, 1858), the following extract from which may be of interest as furnishing his own expression of his views on this subject:—

"No one who has examined the brickwork of Germany and Italy, would doubt that the latter is in all respects the best, whilst it is at least equally Gothic in its character. To me it appears that an architect ought to be allowed to see this without being charged with being desirous to impert Italian architecture into England. We do not trouble ourselves as to the origin of anything that is really good and artistic. If it come from Venice, well; if from Lincoln, so much the better; but, at all events, and above all things, it is essential that we should trouble ourselves to be artists and not mere antiquaries. The hold which Gothic art is rapidly obtaining in this country is the result of the resolute endeavour which has been made to effect this. The new museum at Oxford is not so free from Italian influence as Mr. Parker may desire, but all of us must admit that it is singularly attractive nevertheless; and unquestionably Mr. Scott would be throwing away his best chance of securing for himself a name in the future history of art, if he allowed himself to be debarred from following in the same direction.

I believe that we, who assert that there are lessons to be learnt in Italy and all parts of France, are not one whit less really devoted to our national style than is a gentleman who would limit our foreign studies to a portion only, and that far from the best portion, of the latter country.—George Edmund Street."

It may be observed, however, that the rather marked tendency towards the employment of forms suggested by Italian Gothic, which was exhibited in the building in question, and which was a not unnatural result of his having given special study to that form of architecture shortly before, did not continue to characterise his work to any very great extent, and he soon returned to his natural predilection for the taste and genius of Northern Gothic.

The Gothic style which Mr. Street developed in his buildings was, however, unquestionably largely influenced by a preference for French rather than for English models. The solidity of character, and the sparing use of ornament, which belongs to early French Gothic, had a peculiar charm for him; and his tendency to rely upon solidity and mass in his architecture, and simplicity of detail, seems to have increased as his work went on. He appears to have more and more acted upon the theory that reticence in the employment of ornament, even if carried to the extent of producing a somewhat stern expression, was an infinitely preferable extreme to that of over-decoration. In his lectures on architecture, delivered at the Royal Academy, he decidedly and emphatically urged this view of architectural design, insisting that the very first quality required to produce good architecture was the expression of solidity and endurance in a building, and that only when that was fully considered and attained was it time to enter upon the question of ornament. All his buildings, from a very early period of his practice, exemplify this theory of the conditions of good architectural design. In all of them there is to be remarked the entire absence of anything like flimsiness or flagree, the obvious desire to produce, above all things, solid, substantial, and dignified building. With this quality in his work we are in entire sympathy. His best churches stand as monuments of solid architectural work, in which many of the finest qualities of Mediæval architecture are reproduced with a success which no other modern architect has equalled. They are more notable in this respect than even the modern Gothic of Scott, because they are less actually imitative, and present examples of reproduction of the true spirit of ancient Gothic, rather of its mere outward forms; so that in comparing them with many examples of ancient English Gothic, we might even say, in a sense, that they are essentially more Gothic than Gothic architecture itself always was. Considering how much ornament has been crowded into many modern buildings, in London more particularly, regardless of the conditions and effects of London atmosphere, the Law Courts themselves stand as a remarkable example of reticence in this respect. There can hardly be said to be any ornament that is architecturally superfluous in them; some parts of the building, indeed, rather err in the contrary direction, for which it is possible that Government ideas as to economy are, to some extent, responsible. But, on the other hand, he attached the greatest importance to one source of architectural effect,—that produced by mouldings; the source of effect, which a recent theoretical writer on architecture has generalised under the title, "the modelling of surfaces." Referring to this in his lectures, he stated, very truly, that there was hardly any more decisive distinction between good and bad architecture than that furnished by the style and character of the mouldings. Illustrating the importance of this in his own practice, we are told, on good authority, that in the case of the Law Courts alone he designed with his own hand about 3,000 different profiles of mouldings. Indeed, the personal supervision extended to the details of that immense building, was, we believe, far greater than was generally supposed, or even thought possible by the public or by his professional compeers.

The greatest architectural successes of Mr. Street, however, were in our judgment exemplified in his treatment of ordinary-sized churches rather than of the largest buildings. He had a peculiar power in rendering comparatively small churches dignified and impressive, more particularly in their interior effect. Notable instances of this are to be found in his St. Margaret's Church, at Liverpool, and in All Saints, Clifton. The former gives the impression externally of a small and unpretending church; it has no tower, only a *flèche*, which adds to this unpretending expression; but the appearance of space and dignity in the interior is surprising. All Saints, Clifton, which is really a large church, has the defect externally of hardly looking as large as it is; a defect which would perhaps be less felt if the tower and spire were completed, which are still wanting. But the interior is very fine and spacious in effect. This church was an early example of an experiment, which has occasionally been tried since, of making the main body of the church in one span, and reducing the aisles to a mere passage, securing the effect of the arcade while keeping all the congregation within it, so that no pier anywhere interposes between them and the clergy. The result was not practically as successful as it might have been, as the space between the piers and the outer wall is somewhat too cramped to allow of commodious passage, and the external treatment of the roofing of the aisle, in a series of rather low heavy gablets abutting against the main wall above the piers, is not very picturesque, though the internal effect, as a piece of effect, is remarkably good. With all drawbacks, however, it was a bold and, in its intention, a thoroughly practical idea, and one which it is to be regretted has not been more worked out as a means of rendering the Mediæval form of church more practically adapted to congregational worship.

In the treatment of revived Mediæval architecture, Mr. Street had the good fortune to enjoy one opportunity such as rarely indeed falls to the lot of a modern architect. This was the actual completion of an unfinished Mediæval cathedral, that of Bristol. We call it an unusual piece of good fortune, not only in view of the exceptional interest in such a piece of work, and the repute necessarily attaching to its successful achievement, but because in carrying out such a commission all the critical questions which may be raised as to the suitability of the revival of Gothic as a modern style may be entirely thrown on one side. The commission is to complete in its own style a building which has never been finished, and the architect can indulge fully his sentiment in favour of Gothic architecture without the slightest misgiving on the part of any one as to whether the indulgence is made at the expense of architectural logic and fitness. In carrying out the nave of Bristol Cathedral, Mr. Street obtained a real triumph in the mastery of the power of reproducing Mediæval architecture. Sir G. Scott observed, on the occasion we have before referred to (the presentation of the Gold Medal to Mr. Street), that at an early period of Mr. Street's career his acquaintance with Gothic architectural detail was so complete, that he himself had on one occasion mistaken for original Mediæval work details which had been carried out under Mr. Street's direction some time before. Such a power of assimilation found at least a perfectly legitimate opportunity in the completion of Bristol Cathedral, and except in the fresh appearance of the stone, it would really be difficult to trace any discrepancy of style or manner between the old and the new portion. We regard this as perhaps the most thoroughly successful thing which Mr. Street has accomplished.

This is hardly the time to express any definite opinion about the largest of his works,—the Law Courts,—especially as it is not yet finished, and has not had time to pass the practical test arising from continued use and occupation. Readers of the *Builder* are, however, aware that we never did regard the design, when first published, as fulfilling what might be expected from so important an architectural opportunity, though we fully recognise the fine and powerful character of a great deal of the detail. We must leave the building, however, to the verdict of Time. One thing we may say here,—that those who were present when the architect did the honours of the building to the members of the Architectural Conference, and who may have regarded Mr. Street as an architect aiming at the picturesque of architecture rather than at considerations of plan and arrangement, must have been surprised to hear, in his address on the occasion, so much evidence of the consideration which had been given to the arrangement of the internal planning and the separation and communication of the various departments as required, and the general practical and common-sense tone of the whole address; and if the building should not be successful in regard to its internal convenience, about which we have no sufficient data for a conclusion as yet, it will at any rate not have failed from any intended indifference to practical considerations on the part of its architect. The plan carried out is not the plan we were forced to take exception to when reviewing the design.

The literary portions of Mr. Street's contributions to architectural study is mainly represented by his book on "Brick and Marble Architecture in Italy," published in 1855, and "Some Account of Gothic architecture in Spain," published in 1865. The first-named book dealt with a subject which was then much less familiar to English Architects than it is now, and had a considerable influence in developing architectural taste in that direction in England, possibly a little too much so: but the book is exceedingly well done and the illustrations admirably selected and executed. The work on Spanish architecture which is much larger and more elaborate, has not attracted so much general attention as the interest of the subject and the amount of information and the number of beautiful illustrations it contains might well have acquired for it. In his preface Mr. Street said, "I feel that I have undertaken almost more than an artist like myself, always at work, has any right to suppose he can properly accomplish in the little spare time he can command. Nevertheless, I have always felt that part of the duty which every artist owes to his mother art is to study her developments wherever they may be seen, and whenever he can find the opportunity. Moreover, I believe that in this age it is only by the largest kind of study and range of observation that any artist can hope to perfect himself in so complex and difficult an art as architecture, and that it is only by studying the development of Gothic architecture in all countries that we can form a true and fair estimate of the marvellous force of the artistic impulse which wrought such wonders all over Europe in the twelfth, thirteenth, fourteenth, and fifteenth centuries." It certainly was a most spirited undertaking for so hard-working a professional man to form the design of thus illustrating what is almost an unstudied field of Gothic architecture, as a holiday task in the intervals of business; but this is not the only example that those who do most and work hardest are always those who can manage to do a little more, and certainly the book shows no signs of any undue haste, and is a most important and valuable contribution to architectural literature. Mr. Street's Royal Academy lectures, which were all printed in full in our columns, were among the best professional lectures that have been delivered at the Academy, and showed, as we observed at the time, a catholicity of tone which might not have been expected from his known strong predilections in favour of one school of architecture.

Mr. Street was probably one of the most indefatigable workers ever known in the architectural profession. It is asserted by those who knew him that there was hardly an ancient building of note or importance in Europe which he had not measured and sketched, in whole or in part. He was a splendid draughtsman, and his works were generally illustrated at the Royal Academy by perspective drawings made with his own hand, in the free style of drawing with the pen for which he was noted. We do not mention this as if it were a very peculiar

merit for an architect to illustrate his works with his own drawings,—on the contrary, we hold that there is far more of deputy draughtsmanship than there ought to be in such cases; but it is an exceptional merit, as the present general practice goes. On the occasions when Mr. Street took part in debates on architectural subjects at the Institute of Architects, his remarks were always noticeable for their plain, straightforward, and common-sense tone; he said what he had to say briefly and to the point, without any superfluous words.

From a correspondent who worked a good deal with Mr. Street, we receive some interesting particulars as to his manner of conducting his work. He had generally in his office two or three able draughtsmen (some of whom have since become distinguished architects on their own account), trained under his own eye, and accustomed to carry out what was conveyed in his own carefully-considered but rather roughly-executed pencil work. He drew and figured a plan, a section, principal elevations, with one bay of each expressed distinctly, and with some details sketched to a larger scale as guides to "inking in," and these were completed by his leading draughtsmen, or, in the simpler parts, by the juniors, under their care. He gave details also sketched to a scale of 1 in. or so to the foot with the contract drawings, but in carrying these out full size, he almost invariably altered them in some respects from the form in which they were drawn out in pencil by his draughtsmen, as he said sometimes, "not that *your* work is necessarily bad, but that it must be *mine*." A builder, restoring a church, waited for some full-sized details of mouldings, which were worked out quickly for him in the office, and brought up for Mr. Street's inspection, when, as the contractor said, "he changed them all in shape, drawing all *in* that Mr. —— had drawn *out*, and all *out* that he had drawn *in*." His rapidity was astonishing, and his command of hand for large curves for metalwork and the like, equally so; as, however quickly done, they could generally be followed with the pen implicitly. A clergyman whose church he was restoring having written for details that did not arrive, called at Cavendish-place, and came down from Mr. Street's room in an hour or so with a large roll of papers under his arm, and a triumphant smile, saying, "I have got them all!" When preparing for his usual autumnal run abroad, the quantity of work he put out of hand to be dealt with during his absence was amazing, and at all times his work might be called *ceaseless*, save when sleeping; for even when entertaining friends he went in the evening into his studio, having the doors open from the drawing-room, telling his guests, "You know where to find me." His management of mouldings was supremely good, and probably none, ancient or modern, can exceed those to be found in his carefully-studied church work. He varied his pier-cap mouldings, for instance, in most of his larger churches, drawing them within the same dimension lines on one sheet, and preserving the same character through all, so that it is only on examination in the executed work that you find how beautifully varied they are. His experience and natural shrewdness made him a valuable adviser on points of professional practice, and he had a humour, often very caustic, which one could not help sympathising with. Being asked one day by a brother architect what he advised in a case where a client (on the strength of the Westminster Palace decision against Mr. E. M. Barry) peremptorily claimed possession, as of right, of the drawings for a public building raised at his cost, he replied, "that depends on what sort of a man your client is, and whether you have any expectation of further commissions from him."

As to construction, he was more accustomed to trust to massiveness than to science for security. In restoration, no man could be more conscientious; never disturbing what could be well retained, never altering what had to be taken down and rebuilt, or departing from the spirit of his original where the work was necessarily new, and *specifying* old stone-work not to have the lichens disturbed.

Besides his appointment as architect to the diocese of Oxford (which was bestowed on him through the influence of Bishop Wilberforce, with whom he maintained a warm friendship, which was only closed by the death of the Bishop), Mr. Street also subsequently filled the same post in the dioceses of York, Ripon, and Winchester. He was a Fellow of the Society of Antiquaries, and a member of the Imperial and Royal Academy of Arts at Vienna, and a Knight of the Legion of Honour.

Mr. Street's funeral was to have taken place on this Friday, the 23rd inst., at Holmbury, near Dorking, where he had built for himself the beginnings of an unfinished country house, and where he had built also a church at his own expense. Everything had been arranged, we understand, under the direction of his executor, Mr. Wells, the well-known Royal Academician, but the Dean of Westminster has since sanctioned the interment of his remains in Westminster Abbey, and the funeral will take place on Thursday next, the 29th inst.

In thus briefly reviewing his life and work, we feel that this is not the time to enter into any consideration how far Mr. Street's views and practice as to the all-sufficiency of a revival of Mediæval architecture were or were not in accordance with the genuine requirements of modern architecture. That we have our own views on that subject, and that they are not entirely in accordance with his, our readers will will have no difficulty in understanding. But Mr. Street started in his professional life under the auspices of an enthusiasm for revived Gothic, and it is from that standpoint, and in reference to his own ideal, that his work must, in one sense at least, be judged. His merit, and his claim to the position that he earned, is that he spared no pains in perfecting his own ideal of architecture, and that whatever he did, he did with all his might.*

The following is a list of some of Mr. Street's works:—

Churches.

Kingstone, Dorset.
St. Mary, Holmbury.
Boyne-hill Church and Almshouses.
St. John the Divine, Kensington.
St. James the Less, Garden-street.
St. Mary Magdalene, Paddington.
St. Saviour's, Eastbourne.
St. John's, Torquay.
Long Ditton Church.
American Church in Rome.
English Church in Rome (now building).
English Churches in Genoa, Constantinople, Lausanne, Mürren, Vevay.
All Saints', Clifton.
Toddington.
Garrison Chapel, Portsmouth.
Pylingdales.
New Pitsligo.
St. Margaret's, Liverpool.
Tinsley.
Muirhead.
St. Mary, Southampton.
Speenhamland.
Church for Americans Paris, now just being begun.
Helperthorpe, Kirby, Grindalythe, Thixendale, Fimber, and many others, for Sir Tatton Sykes.
Buterofct, Ellon, Llandulas, Swinton, Eltham, Milarow, &c.
St. Philip and St. James, Oxford.
Summertown, Oxford.

The most noteworthy Ecclesiastical Buildings.

Bristol Cathedral, nave and western towers.
Dublin, Christ Church Cathedral and Synod House.

Some Restorations.

Bere Regis, Thornhill, Melksham.
York Minster, south transept.
Works in Carlisle Cathedral and Fratry.
St. Peter's, Bournemouth.
Works at Salisbury Cathedral.
High Wycombe Church.
St. Peter's Mancroft, Norwich.
Hythe Church, South Hayling, Kettering, Tettenhall, Henbury, Luton.
Jesus College, Oxford.
St. Luke's, Lower Norwood.
Wheatley, Welchpool, Guildfield, East Harptrees.
Wellington Barracks Chapel.
Kirby Underdale, Kirby Wiske, Kirkby Overblow, Sledmere, Charleywood.
St. George's, Bloomsbury.
Farlington, Tamworth, Thirsk, Barnsley, Bignor, Hagley, Hadley, Claybrooke, Colmere, Clun, Great Dufficld, Kildare Cathedral, Monmouth, Oswestry.
St. Martin's, Leicester; St. Margaret's, Leicester.
Yatton, Dunster, Thurgoland, Backwell, Weatherthorpe, Speen, Monkland, Gresford, Aston Abbott's.
St. Michael's, Penkivel, &c.

Buildings other than Churches.

Theological College, Cuddesdon; St. Margaret's Convent, East Grinstead.
Vicarages:—Kingstone, Dorset; East Heslerton; Chapel Allerton; Melksham, &c.
Rectories:—Wigan, &c.
Duncombe House and Chapel.
Haddo House.
Grwych Castle, private chapel.
Luton Hoo, private chapel.
Longmead, Bishopstoke.
House in Cadogan-square.
Holmdale (near Dorking).
School buildings at Uppingham, Marlborough, and Bloxham.
Master's house at Winchester.
Schools at Wigan, Eaton Town, and Wantage.
Home at Wantage.
Dundee House of Mercy.
Parsonage, Erle Stoke.
Many other schools, houses, and vicarages.
Royal Courts of Justice.

* A portrait of the subject of our memoir will be found in vol. xxvii. (1869) of the *Builder*, p. 706.

THE LATE MR. DECIMUS BURTON.

WE regret to record the death of an old and eminent member of the architectural profession, Mr. Decimus Burton, F.R.S., F.S.A., which took place on the 14th instant, at his residence, No. 1, Gloucester Houses, at the mature age of eighty-one.

Mr. Burton, although he had been practically for fifteen years past a retired member of the profession, and owing to his advanced age, had of late years been little seen amongst his professional brethren, was well known to many, and was, by all who had the advantage and pleasure of meeting or associating with him, respected as a straightforward and high-principled professional man, and in society as a cultivated gentleman.

Born in the year 1800, he received a good practical education in the office of his father, Mr. James Burton, who was well known sixty years ago as one of the most active and enterprising of London builders, and afterwards as the founder of the town of St. Leonards-on-Sea. Mr. D. Barton completed his professional education in the office of Mr. George Maddox.

Mr. Burton received, when quite a young man, important commissions, and found himself, before he had completed his twenty-fourth year, in the full tide of professional work. He was scarcely twenty-three when he was commissioned by Mr. Horner to build the Colosseum in the Regent's Park, a building which, although as a panorama and a place of entertainment a failure, was regarded as involving the architectural feat of throwing an unsupported dome, a few feet larger than that of St. Paul's over the whole building,—a success. It has since been pulled down, and its place, which knows it no more, has been made the basis of a more profitable investment in the shape of the terrace of private residences forming Cambridge-gate.

Mr. Burton was in the year 1825 commissioned by the Government to carry out the Hyde Park improvements, which comprised the laying out of the roads, and the design and erection of the façade and triumphal arch at Hyde Park-corner.

The arch was intended to form the principal entrance to Buckingham Palace; but the alterations subsequently effected in the approaches have left the arch in what appears to be a comparatively unmeaning, although a still effective, position.

It is the frequent fate of architects to undergo many and sore disappointments in the alteration or incomplete fulfilment, and sometimes the mutilation, of their cherished designs. One of the hardest trials Mr. Decimus Burton had to bear was the disfigurement of his arch by the imposition of a colossal equestrian statue of the Duke of Wellington, and that too, placed, contrary to all classical precedent, across, instead of parallel with, the roadway spanned by the arch.

In vain did Mr. Burton protest against the disfigurement of his beautiful edifice, urging upon the authorities that the arch, if it was to be treated as a pedestal, was not properly proportioned to the statue, or, having regard to the character of the latter, in harmony with it; that the group originally designed for the surmount was a *quadriga*, the car, with its four horses, forming a pyramidal group proportioned to the whole structure. In vain did Viscount Canning write in his official capacity from the Office of Woods and Forests to the then Duke of Rutland, the chairman of the committee of subscribers to the Wellington Memorial, on the 15th of May, 1846,—"It is my duty to state to your Grace that the remonstrances which reach her Majesty's Government against the proposed appropriation of the arch are so many and so strong; the representations of its architect, Mr. Burton, in the same sense, are so earnest; and the opinion of every other eminent architect, artist, or competent authority who has been consulted on the subject is so decided, that her Majesty's Government feel called upon, not only to make a final effort to induce the subscribers to reconsider the subject of placing the statue on the site at present proposed, but to do all that lies in their power to facilitate a change in the design." And he proceeded to propose that the statue should be erected upon a suitable pedestal of its own elsewhere (other sites being suggested), Parliament defraying any increased cost of the change. All was to no purpose; the arch had, so to speak, been engaged to the statue seven years before by Lord Melbourne, the Minister of the day, and the alliance was ratified by his successor: subscribers had sub-

scribed their money, and the statue had been bought on the faith of its being engaged to Mr. Burton's unhappy arch, and the customs of a strictly constitutional country did not permit of the engagement being repudiated. The opinion as to the unfortunate effect of the result, in the minds of those who had any sense of the architectural and artistic fitness of things, is well indicated in an anecdote which, if not true, is at least *ben trovato*, of a French general officer, who, after contemplating the arch and statue for some time, was overheard to say to himself, "Nous sommes vengés!" It may be added that any idea of removing the statue from its unsuitable position would have been rendered impossible during the life-time of the Duke of Wellington by his own strong opposition to any such proposal. The duke's sense of artistic propriety was not strong, and his feeling probably was that where the nation had decreed to place a statue in honour of him, there it ought to remain. Of Mr. Burton's own strong feeling in the matter, he gave a remarkable practical proof in the fact that for many years afterwards, if we are rightly informed, he made provision for the payment to the nation, out of his personal estate, of 2,000*l.*, if they would accede to the removal of the statue from its unsuitable position; but seeing little prospect of his hope being fulfilled during the present century, he before his death withdrew the legacy, cherishing, however, to his dying day the hope that the nation, when it should return to, or develop, its artistic senses, would remove the Wellington statue elsewhere, planting it on a fitting pedestal of its own, and carry out the *quadriga* and bas-reliefs to complete the work according to his original design. We know not whether it is of any use still to express the hope that this may be done eventually, in justice to a man who held a distinguished place among English architects in his own day, and in the furtherance of architectural art and the removal of an absurdity which is still the subject of constant satire. Much cannot, however, be hoped in a country in which it has just been considered suitable to adorn the site of the Egyptian "needle" with a couple of modern sphinxes placed, contrary to all architectural precedent and meaning, with their noses to the central object and their posteriors displayed to the spectators approaching in either direction along the only route of approach.

Greek architecture was in Mr. Burton's time the order (or the "Orders") of the day, and formed his model mainly, though the Constitution Hill arch is, of course, a Roman type of erection. He did not, however, in his buildings for practical purposes, affect massive temple-like structures with heavy porticos and light-obscuring columns, but gave to his works graceful and refined elevations, and provided ample openings for light and air; and though such provision be nothing more than the common-sense of architecture, he must be given the credit of having attended to this at a period when many architects ignored it; and we consider that the criticisms which have been elsewhere made as to the want of practical character in his domestic buildings, are, considering all the circumstances and the taste of the time in which he worked, unjust and uncalled for.

Mr. Burton's public works would probably have been far more numerous and important had he not been early tempted by the offer of Mr. John Ward, of Tunbridge Wells, from whom he accepted a special retainer to lay out for him the Calverley Park Estate. This engagement occupied most of his time for some years; and this break, coupled perhaps with his disinclination to work much for the representatives of a public which had already suffered one of his best architectural works to be marred, tended to divert him into the quieter field of house-building for noblemen and gentlemen, in which he much distinguished himself. The mansions, villas, and cottages designed by him were numerous, and were characterised by good internal arrangement combined with external simplicity and purity of style.

Mr. Burton had for several years before his death retired from the active pursuit of his profession, and in 1869 finally relinquished it. He was much attached to St. Leonards-on-Sea, where he had a pleasant bachelor's cottage. Latterly he had been in failing health for some months, but it was not until some seven weeks before his death that his friends had special cause for anxiety. His physical powers then gradually failed, and he breathed his last on the 14th of December, without pain or suffering; a quiet decease which seemed in happy accordance with a life during which he had been known as amiable, considerate, and gentle to all.

Mr. Burton made, when travelling was not so common as it is now, a lengthened tour in Italy and Greece, visiting and carefully studying the ancient buildings and remains in those classic regions; and at a later date he made a visit to Canada and the United States. He was a Fellow of the Royal Society and of other learned bodies, and was one of the earliest Fellows of the Royal Institute of British Architects, of which also he had been a vice-president.

The death of Mr. Burton occurring almost simultaneously with that of Mr. Street brings into significant contrast the characteristics of two successive epochs of modern English architecture, and the extraordinary rapidity with which the pendulum of architectural taste in this country has swung from one extreme to another. Mr. Burton's long life has only just terminated, and yet the method of architecture which he practised during a long professional career is already like a vanished dream. Of the men who are most prominently and strenuously engaged in architectural practice at this moment, there are probably few who would not be disposed to regard Mr. Burton's architecture as hardly worth recollecting; Mr. Street himself would probably have scouted all reference to it, as exemplifying the work of a period of architectural imbecility. There is no pretence for saying that Mr. Burton, as a leading representative of his period, evinced anything like that extraordinary enthusiasm, force of character, and power in dealing with architecture from his own point of view, which have made Mr. Street's career such a remarkable one. But if we consider how highly in his own day he was esteemed, and how completely right his view of architectural art was considered to be by a large following of clients, many of them men of high education and culture, it certainly may be said that his career suggests matter for serious reflection, on the part of those who, with perhaps more enthusiasm and genius, are now nevertheless carrying out other revivals of past styles of architecture, with, in many cases, much less consideration for the really practical objects of architecture than he evinced. Are they sure that in the lapse of another generation of men their own favourite revived phase of architecture may not appear as *passé* to their successors as Burton's architecture now appears to some of them?

Dropping this consideration as one not unworthy of being followed out to practical ends, we conclude by appending a list of Mr. Decimus Burton's principal executed works:—

1822-24. Cheshunt, residence, additions, &c.—Mr. Joseph S. Jessopp.
1822 23. Brighton, villa.—Mr. H. Fauntleroy.
1823 26. Holyrood, mansion, &c.—Mr. John Ward.
1825 55. Tunbridge Wells, Calverley improvements.—Mr. John Ward.
1822-24. Regent's Park, Grove House and offices.—Mr. G. B. Greenhough.
1822-27. Regent's Park, the Colosseum.—Mr. Thos. Horner.
1822-25. Leatherhead, Elm Bank, additions.—Captain Stanley Clarke.
1822 48. Pall-mall East, house and warerooms.—Messrs. Hebbert & Co.
1823 25. Baston House, Kent, additions.—Mr. Samuel N. Ward.
1824-44. Molesey, Surrey, additions; Stokes Bay, Marine Villa.—Rt. Hon. J. W. Croker.
1826 27. Pall-mall East, houses and shops.—Sir H. F. Cooke.
1827. Mitchells, Tunbridge Wells, villa.—Mr. C. H. Okey, Mr. John Carruthers.
1826. Abersychan Iron Works, the designs.—The Company.
1827. Liverpool, mansion, the designs.—Mr. Joseph B. Yates.
1826-41. Zoological Society, London, buildings and gardens.—The Society.
1829-30 Tunbridge Wells, Great Culverden House.—Mr. J. Jeddere Fisher.
1829. Bath, Public Baths Improvement, report.—Corration.
1828-30. Tunbridge Wells, Calverley Park, villas, &c., d signs.—Messrs. Bramah.
1825 46. Hyde Park, general improvements; lodges at Cumberland, Grosvenor, Chesterfield, Hyde Park-corner (façade), and Prince of Wales Gates; archway on Constitution-hill; improvements and lodge in Birdcage Walk; guards' store and Westminster Mews; the railing and piers, Buckingham Palace.—H.M. Commissioners of Woods, Works, &c.
1828-31. Carlton House-terrace, mansion.—Lord de Clifford.
1828-32. Carlton House-terrace, mansion.—Lord Stuart de Rothesay.
1829. Beckenham, villa residence.—Mr. B. Oakley.
1827. Harrow, two houses.—General Macgregor.
1828-31. London, Royal Naval Club.—The Club.
1827 30. London, Athenæum Club House.—The Club.
1830-32. London, warehouse, &c.—Messrs. Gilpin & Co.
1832 33. Regent's Park, Holford House.—Mr. James Holford.
1831-33. London, Charing-cross Hospital.—The Governors.
1831 32. Sevenoaks, Rectory House.—Rev. Thomas Curteis.
1831-32. Pain's Hill, Surrey, additions, &c.—Mr. W. H. Cooper.
1830 34. Clifford's Inn, improvements.—The Society.
1830. Park Hatch, Surrey, conservatory, &c.—Mr. Joseph Goodman.
1831. Stock Grove, Beds, additions.—Col. Hanmer.
1833. Holland House, restorations.—Lord Holland.
1830. Pall Mall, alterations of residence.—Mr. John Kirkland.
1829 31. Mabledon, Kent.—Mr. John Deacon.
1831 32. Ramsgate, East Cliff House, additions, &c.—Sir Moses Montefiore.
1829-34 Southborough, Kent, church.—Mr. John Deacon.
1831 31. St. Martin's Place.—Royal Society of Literature.
1832-33.—Benthall Hill, Kent, house and offices.—Mr. Arthur Pott.
1833. Worth Park, Sussex, additions, &c.—Mr. Montefiore.
1837-48. Chatsworth, palm-house, home farm, &c.; Chiswick, lodges and gates; alterations, &c., at Grove House; Corney House, Sutton Court; Devonshire House, portico, hall, staircase.—Duke of Devonshire.
1831-3?. Penshurst, Kent, the Grove.—Mr. Allnutt.
1831 35. Bury Hill, Surrey, additions, &c.—Mr. Charles Barclay.
1832 30. Penbury, Kent, Spring Grove.—Mr. A. B. Reiver.
1837-31. Riverhead, Kent, church.—The Trustees.
1831 32. Whitehall Gardens, additions.—Mr. Cuthbert Ellison.
1832-37. Regent's Park, St. Dunstan's Villa.—Marquis of Hertford.
1831-34. Combe Wood, house and offices.—Mr. W. C. Hunt.
1835-38. Vere, Somersetshire, additions, &c.—Sir W. Medycott, bart.
1830 31. Regent's Park, St. John's Lodge, additions, &c.—Sir J. L. Goldsmid, bart.
1831-38. Broomhill, Kent, house and offices.—Mr. David Salomon.
1831-38. Burswood, house and offices.—Mr David Salomon.
1834-37. Oaklands, Sussex, house and offices.—Mr. Hercules Sharpe.
1838-40. Blackheath, Kent, house and offices.—Mr. James Traill.
1836-38. Blackhurst, Kent, house and offices.—Mr. Ford Wilson.
1845. Bellevue, Tunbridge Wells, house, &c.—Mr. Aretas Akers.
1838 44. The Hooke, Sussex, additions, &c.—Mr. R. W. Blencowe.
1858-60. Bineham, Sussex, mansion and offices.—Mr. John Blencowe.
1839 41. Woodhayes, Surrey, additions, &c.—Mr. Wm. Brown.
1847-48. Bury Hill, observatory.—Mr. A. K. Barclay.
1845-46. Harrow, boarding-house.—The Committee.
1855-56. Hyams, Surrey, additions and alterations.—Hon. Mr. Seymour Bathurst.
1855-58. Sennowe, Norfolk, additions and alterations.—Trustees under the Court of Chancery.
1841 45. Stapleton Palace, near Bristol, additions and alterations.—Ecclesiastical Commissioners of England.
1834-35. Glevering Hall, Suffolk, additions, &c.—Mr. A. Archdeckon.
1834-35. Derby House, near Liverpool, building estate,—Mr. R. A. Barton.
1835-40. Eastbourne, building estate, a villa.—Earl of Burlington.
1839-40. Belgrave-square, additions.—Earl of Burlington.
1835 37. Kennington, near Canterbury, additions to residence.—Dr. Carter.
1835-36. Holland's, near Tunbridge Wells, villa.—Rev. H. Cholmondeley.
1838-39. Harrow, Middlesex, residence.—Rev. J. W. Colenso.
1838 39. Club Chambers, Regent street.—The Association.
1837 39. Trinity Church, Eastbourne.—The Committee.
1834-35. Great Brick Hill, rectory house.—Rev. H. Poulis.
1838 40. Flimwell, Kent, church.—The Trustees.
1837-38 Putney Park, additions to mansion.—Mr. R. Hutton, M.P.
1839 50. Grimstone Park, Yorkshire, mansion and offices.—Lord Howden.
1839-40. Kelvinside, near Glasgow, building estate.—Mr. M. Montgomerie.
1835-36. Grosvenor-street, additions to residence.—Duchess of Roxburgh and Col. O'Reilly.
1839-40. Greenstead, Essex, parsonage.—Rev. P. W. Ray.
1830. Wolstone, Bucks, parsonage.—Rev. Dr. Butler.
1835-4?. Coghurst, Sussex, mansion and offices.—Mr. Musgrave Brisco.
1839-61. Stanwick Park, Yorkshire, additions, &c.; Syon, river terrace, ornamental dairy, &c.—Lord Prudhoe, afterwards Duke of Northumberland
1844. Stokes Bay, villa.—Lord Ashburton.
1843-50. Queenstown, Cove of Cork, improvements, seawall.—Viscount Middleton.
1840-59. Royal Botanic Gardens, Regent's Park.—The Society.
1835-43. Fleetwood, new town, church, hotel, lighthouse, &c.—Sir H. Fleetwood, bart.
1845-59. Bournemouth, new town.—Sir G. T. Gervis, bart., and Trustees.
1836-38. Goring, Sussex, parish church.—Mr. David Lyon.
1843. Folkestone, building estate.—Earl of Radnor.
1841-50. Union Club, London, additions, &c.—The Club.
1842-60. United Service Club, London, additions, &c.—The Club.
1842-52. Junior United Service Club, London, alterations.—The Club.
1853-58. Beswood, Berks, additions, alterations, &c.—Mr. J. Walter, M.P.
1834-49. Dublin, Phœnix Park Improvements.—Her Majesty's Commissioners of Woods, &c.
1844-66. Kew Royal Botanic Gardens' Improvements, Palm House, Winter Garden, &c.—Her Majesty's Commissioners of Woods and Works.
1840 49. Paris, Ambassador's House, improvements, &c.—Her Majesty's Commissioners of Works, &c.
1852-55. Belmore, Sussex, additions, &c.—Miss Dealtry.
1855-57. East Retford, Free Grammar Schools.—The Trustees.
1841-42. 18, Hyde Park Gardens, residence.—Mr. Drummond.

1841-43. Hayden Hill, Bushey, Herts.—Mr. T. G. Fournereau.
1845-46. Hill of Howth, building estate. — Earl of Howth.
1845-46. Harrow, head master's house.—The Governors.
1842-43. Hemingford, Huntingdonshire, house and offices. —Rev. J. Linton.
1849-53. Church, Launceston, restoration.—Church Building Society.
1845-47. Whipp's Cross, house and offices.—Mr. J. Masterman, jun.
1849-51. Bradford Peverell, Dorset, church.—Mr. H. N. Middleton.
1850-54. Bradford Peverell, house and offices.—Mr. H. N. Middleton
1853-54. Great Stanhope-street, additions, &c.—Mr. A. Mitchell.
1857-58. Finchampstead, Berks, house and offices.—Rev. T. Mozley.
1852-54. Oriental Club, London, additions, &c.—The Club.
1853-54. Calstock, Cornwall, Rectory House.—Rev. C. L. Pemberton.

ABOUT THEATRES AND CHURCHES.

THE terrible catastrophe at Vienna impels us once again to raise the voice of warning as to our own negligence,—we fear, increasing negligence,—in the provision of due exits from our public buildings. We did so, our readers may remember, on the occasion of the last general election; and very serious injuries were reported, within a few days after our warning, as occurring to well-known individuals, in consequence of the absence of proper arrangements for this purpose. We have now the accounts, daily increasing in the estimates which they give of the loss of life by this last fatal occurrence, of which it may certainly be said that if fire slew its units, panic slew its hundreds. The slaughter effected is as much as that of a great battle; and the proportion of deaths to wounds very far more than in any battle of modern times. But we cannot but remember that even this frightful slaughter is far less than that which took place in a church in South America. And while it is well that a thorough investigation should be made of the condition of our theatres, both as to construction and as to the readiness for use of all those appliances which a wise forethought has provided for service in case of fire, we must reiterate the advice to take some similar precautions in the case of our churches. Year after year they become more numerous, as well as more densely filled. Year after year are they more luxuriously warmed, more dazzlingly lighted, and, in but too many cases, so carefully guarded against draught that the wise architectural rules of the old Roman and Gothic builders are wholly disregarded, and ancient doors are even walled up without any substitute being provided. In new churches the same utter disregard of the first requisite of a public building, provision for the safety of its inmates, is to be found. We called attention, as yet without effect, to one example, that of a church built within the last few years in a country town with many elements of architectural excellence and beauty; served by devoted clergy, filled by numerous and munificent congregations, and yet in which the main exit at the north-west corner of the building is marked by the combination of almost every fault that can deform this part of a public edifice,—doors opening inwards, two doors opening into one vestibule, from which there is only one door of exit, and steps downwards, both into the vestibule and from the outer door of the church. In addition to this accident-trap there are only a north door of moderate size, and two or three very small doors used for the purposes of the clergy and attendants of the church. There can be no doubt that, in the event of a panic, from which no gas-lighted building is safe, the consequences here would be most disastrous; and yet benevolent and well-meaning people are content to go on raising funds for the adornment of the church, paying no heed to the loud warnings which are given to them, by such an occurrence as that at Vienna, of its utter unsafety. Is it necessary now to recall attention to the fact how apt a source of panic, and even of disaster, is a copious illumination by gas?

One of our correspondents discusses, in a thoughtful manner, the necessity for providing against panic, as well as against danger. The method which he suggests is to provide tiers of open galleries outside the main walls of the building, each gallery being of sufficient area to contain all the occupants of that stage of the theatre. Broad staircases, apparently intended to be external, would descend from these galleries into the street. The idea is not without merit. But the large addition that it would make to the non-paying area of the ground covered by the theatre would prove a very strong obstacle to the adoption of the plan.

But why are we so slow to follow in principle the wise, and we may almost say perfect, arrangements of those great builders from whom we have derived almost all that we know of architectural theory? In Rome, especially in the Imperial times, public amusement was one of the chief subjects of the study of the statesman. The call which he made on the architect to provide a stage and an auditorium for great exhibitions was responded to by the very genius of architecture herself. Let the student climb the deserted steps of the great amphitheatres at Capua, at Pozzuoli, at Pompeii, or on other Italian sites, and ask himself what arrangements can be more perfect. It is, no doubt, true that the requirements of the modern theatre are necessarily different from those of either the amphitheatres or the theatres of Imperial times. Of that class of building which suits the exigencies of modern opera or drama we have no classical example, and that for the good reason that the method of the performances is entirely different from that which prevailed on the Greek or the Roman stage. Palladio, indeed, built a theatre at Venice, and Serlio built one at Vicenza, according to the principles of Vitruvius; and towards the close of his life the former architect built the Teatro Olympico at Vicenza, which still exists, being at once the finest and the best of its race as a classical theatre in modern Europe. With these exceptions we cannot trace one existing theatre, or those which they represent, further back than the first quarter of the seventeenth century. The theatre of the Hôtel de Bourgoyne was famous in Paris about 1620, and was rebuilt, with tiers of boxes, in 1645. The theatre of the Palais Royal was built by Richelieu in 1639, and the horseshoe form was first given to the auditorium by Fontana, in 1675, in a theatre which he built in Rome.

The consideration which led modern architects to depart from the admirable simplicity and beauty of the amphitheatrical arrangement was, that in the modern drama, which is not intoned, but spoken, and in which prose is for the most part used instead of metrical verse, it is necessary to bring the furthest auditors within range of the audibility of the human voice, and even of the female voice. Again, with the disuse of the strongly-accentuated mask, and the other appliances by which the Greek drama was able to affect spectators at a considerable distance from the stage, it became necessary to bring the most distant spectators within such a distance of the actors as to allow the play of their features to be distinctly visible. In the common Punch's show of our streets we find a survival of the classic drama. It is evident that a human Punch, furnished with an appropriate mask, might perform his well-known pranks, aided by his instrumental squeak, on a stage in such a manner as to tell on an immense audience. On the other hand, and at the very opposite extremity of the scale, we can cite the Policinello Theatre at Naples, which we conceive to be probably the smallest public permanent theatre in Europe. Stalls, boxes, pit, are all of the most miniature description; and the largest possible audience is so small, that the performance is repeated twice in the day. But in this wonderful little cockleshell, the art of pantomime has reached its very acme. The pantomime of the principal performer, Policinello, or Punch, who wears a loose white linen blouse and trousers, and a mask over his forehead and the upper part of his face, is so magical as to affect the spectators to the highest degree, so that the little den, fetid as it becomes in the course of the performance, is,—or at least was in the Bourbon days,—a favourite resort of the royalty as well as the nobility of the Two Sicilies. The play of features on the exposed part of the face of the actor was such as it would be idle to attempt to describe. Here the connexion between a very small theatre and a perfect actor, of his class, was intimate and essential.

The limit of distance at which the practice of the theatrical architect has usually halted in Europe has been from 50 ft. to 70 ft. The theatre at Marseilles has a distance of 76 ft., and that of Versailles of 77 ft., from the curtain to the back of the boxes; but the noble theatre at Bordeaux has only 70 ft., which is also the distance in our own theatre of Drury Lane. This regards dramatic theatres. For lyric theatres the range is wider, reaching up to 100 ft. in the San Carlo Opera-house at Naples, and to 105 ft. in La Scala Theatre at Milan. Taking, then, this extreme range of, say, 66 ft. to 100 ft. for the two kinds of theatres, the arrangement of boxes tier above tier becomes a necessity,—the height being only limited by the angle at which the performers become so foreshortened as to be out of true vision.

Thus far the architecture of the modern theatre has been a natural growth; whether it provides three tiers of boxes, as at Versailles, or seven, as at La Scala. But here comes in a point which, so far as we are aware, has never yet been adequately grasped by any architect or architectural writer.

If we look at the sections of any modern theatre, the building divides itself into two main parts of almost equal dimensions, to which all the other arrangements are subsidiary. These are, of course, the stage and the auditorium. But if we look at the section of an amphitheatre we see three equally important parts,—of which the stage, indeed, is generally the smallest. But the provision for the exit and entrance of the people is as conspicuous as, and occupies as much if not more space than, the auditorium itself. Thus, in a building as vast as the Colosseum, the time of from 100 to 140 seconds was sufficient to empty it altogether, and as crush was impossible, panic was deprived of its terror.

Whether this wise and beneficient arrangement sprang directly from the brain of the great architects, or to some extent wrought itself out from the other conditions of the amphitheatre, it is unnecessary now to discuss. What is important is, first the fact, and secondly the truth, that the precaution has been absolutely neglected in the modern theatres. We do not say that care has not been given to entrances, staircases, corridors, or the like. But we say that that balanced compensation for thickening crowds which is present in all the amphitheatres of which we have any knowledge is wholly absent in the modern theatre.

The reader will see at once what we mean when he reflects that the amphitheatre presents the frustum of an inverted cone, enclosed in a tower. The modern theatre presents two concentric towers, — or rather one tower, with interior landings, divisions, and staircases. In the amphitheatre the largest number of persons that could be contained in equal vertical heights was that which sat on the topmost six or seven steps of the ring. For these an external corridor, separated by a wall thickening as it descended from the auditorium, gave ample space for circulation. Rapidly as the people could pour out from the numerous gangways between the *cunei*, there was in every instance room for them all in their own corridor. But in the corridor below, answering to the next eight or ten steps of the conch, there was not only the width of the top corridor, but the additional width of 10 ft. or 12 ft. due to the contraction of the cone. And thus, however fast the people poured from above, even had the flow been like that of water itself, there was no heading back, no stoppage. The only thing necessary to care for to prevent this was equally to increase the number of staircases from story to story. The corridors, which of course, became not widened so much as multiplied, as they descended, were each always ample to accommodate not only their own population, but that of all the superior zones.

Of this admirable self-compensation for thickening crowds there is not a vestige in the modern theatre. We do not, of course, pretend to say that in planning corridors and staircases the architect has taken no heed of the number of persons that they were to serve. But there is no evidence in any section of a great theatre with which we are acquainted, from La Scala to the New Opera-house at Paris, of the presence of the idea that it might be necessary to prevent the heading back of a madly precipitant crowd. On the contrary, the outer wall containing the corridor is as vertical as the inner wall. Serial escape is thus alone possible, unless the accommodation be immensely in excess on the top story, in which, it must be remembered, the position of the gallery in most theatres accumulates the class of people likely most madly to suffer from panic, and that in the most overpowering numbers. We cannot but conclude that modern theatre-builders, from Fontana downwards, have neglected one of the most subtle and important rules acted on by the Roman builders.

It may be said that to carry out the dictates of absolute prudence in this case would involve

the giving a conical or pyramidal form to the outside of the building. To the structural proportion of auditorium and exit it would no doubt give such a form. If you wish to produce the economy of room, which was given by the inverted cone in the tower, it can only be done by the use under modern arrangements of the upright cone without the tower. But there is no reason why the outer walls of the building should be conical, or, rather, stepped; although there is reason for the successive widening of the corridors. Rooms available for many purposes might be built over the receding galleries. If the great principle of absolute safety from crowding were once accepted, other details would fall into place.

We say nothing here of those great *salles des pas perdus*, and the like, which are daily assuming more importance in modern theatres, forming almost a third part of the structure. All with which we are now concerned is absolute safety of exit. We have seen how that was assured by the Roman builders. We have seen how it has been lost sight of, at all events as a self-regulating feature of the building, by their successors. And we commend the consideration of the subject to those whom it so closely concerns. In a building on one plane, all that is demanded for safety is an adequate supply of doors. In a building on many planes, the exigencies of each plane become the more serious, the more stories rise above it from the ground.

Nor is it less important to provide for the structural separation of auditorium and exit. This ought to be such that while free egress from the one to the other is practicable, there should be a substantial barrier against fire. This the use of sheet-iron doors renders easily practicable. In the amphitheatre this security was attained by the small size of the gangways, and the thickness of the wall which was required for the support of the stepped seats, increasing as that did in thickness with every row. No doors appear to have been fixed to these gangways. Nor were they requisite. Curtains were no doubt hung over the apertures into the corridor, which would answer the only end for which doors would be otherwise needed, the prevention of draught. And we have personally little doubt that the thick-padded curtain which usually falls over the ever-open wickets in the doors of the great Italian churches, is a survival of the kind of curtain thus used in the Roman theatres.

If we contrast this simple and effective separation of the auditorium and the exit galleries in the Roman theatres, with the flimsy backs that divide the boxes of our opera-houses and theatres from the corridors which give access to them, we cannot fail to be struck with the difference in the matter of safety, in the event of fire. Of all instances that occur to memory, that of La Scala, at Milan, is the most reprehensible in this respect. We cannot, indeed, speak positively as to the structure of the back of the boxes here, although long habit of attendance in our own box at the San Carlo Theatre, at Naples, induces us to think that no true structural division exists at Milan. But to the greater number of the boxes in La Scala a small *salon* or cabinet is attached, not immediately, but on the opposite side of the passage. Thus the outer case of the auditorium is not so much the horse-shoe form of the back of the boxes, as the rectangular form of the back of the *salons*; the corridor, or passage, forming a mere pathway between the two rooms. Thus, in case of any great fiery catastrophe, such as an explosion of gas, or a storm of flame such as enwrapped the Vienna Theatre, the corridor, or mode of escape, would be involved in the same destruction as the auditorium; and escape would be rendered impossible. We think that after this essential requisite for the safety of a theatre has thus plainly been pointed out, any architect who neglects to provide for it will undergo the gravest responsibility. But further than that, we think there should be legislative interference to prevent the construction or use of buildings intended for public occupation without due heed to the principle of safety.

Of course it would be competent to the architect who desired to prevent the widening or multiplication of corridors with each tier of descent to accomplish the same object by supplying each corridor with its own pair or two pairs of staircases, independent of those below. But in this case no access into these staircases should be allowed from any lower corridor. Each set of stairs should be rigidly restricted to the service of its own floor. In the amphitheatre the stairs are in proportion to the width or number of the parallel corridors. It might, perhaps, prove more accordant with the turret form of the auditorium to multiply external staircases, rather than to multiply concentric corridors, each furnished with its own means of ascent or descent. That is a matter of detail which will form a feature in any future designs, according to the genius of the architect. We refer to it as showing a mode in which the great aim of safety can be carried out, without attempting to put any limit on the freedom of design. What is essential, in our opinion absolutely essential, is this.

While entrance to a church, theatre, or other public building, may be conveniently allowed by the use of an appropriate number of small doors, each admitting only one or two persons at a time, it is essential to safety that exit should be afforded by an adequate number of large doors, opening outwards, and all of equal width with the aisles or corridors that lead to them. The stately western doors of some of the great cathedrals were not matter of pomp alone. In fact, the occasions on which they were so used must have been rare, as the clergy usually entered in procession from the chapter-house, or some room for assembly on the south of the church, through a south door west of the chancel. But not only were these large doors (never obstructed by those inner vestibule and baize-covered doors now required to guard our congregations from the west wind) noble architectural features of the building, but they possessed a special value in any case of emergency or alarm. By throwing wide open, as is generally done at the close of a solemn service on a *festa*, all the doors of a cathedral, exit is afforded for the worshippers in a very brief space of time. Nor shall we be entitled to be regarded as a people whose boasted regard for human life is strong enough to induce us to take a little trouble when danger is not visibly before us, if we do not take stringest measures to ensure such a visitation of all our great buildings, religious or secular, as shall ascertain which of them are, and which are not, duly provided with ample means of exit.

For buildings on one floor the rule is simple enough; and it is not one of the least valuable features in the modern movement for the restoring and building of churches that the clumsy expedient of the gallery is more and more disused. But when galleries are allowed in churches, and tiers of boxes and galleries in theatres, the inflexible rule that each plane occupied must have its own adequate and independent exit, with the flow of persons from which no flow from any other plane or story can mix or interfere, should be made imperative.

We need hardly add that the provision of an iron curtain, shutter, or pair of strong doors, to shut off the stage from the auditorium, should be imperative in every theatre. It may be said that this proved useless at Vienna. It would be more correct to say that this expedient, though provided, was not used there. Why not, we shall probably never know, but it is probable that all those whose duty it was to act lost their presence of mind at the critical moment. But this brings us to another point, without attention to which we have ample and reiterated proofs that the best provision for safety usually proves inoperative. Provisions for safety can rarely be made self-acting. At this moment we can only recall one, architecturally speaking, which is so, and that is the mode of exit from the amphitheatre which we have above described. The human element comes in, if it be but to turn a tap or to move a lever; and when suddenly called on to act, nine men out of ten, or more likely ninety-nine out of a hundred, lose their heads. If this hesitation be only for a few seconds, the mischief may be irremediable. It is of no use to lament; such is human nature, or rather, such has human nature become under the influence of civilisation. We do not fancy that the hardy warriors of Pepin or Charlemagne would have allowed themselves to be destroyed by the cause, whatever it was, that led to the destruction of the Ring Theatre.

Even in military sentinels we should place little reliance, unless they were men actually trained in the exigencies of war under the fire of the enemy. But there remains an expedient which we think might be adopted with admirable results. We are not aware whether it is at this moment in force in the Royal Navy. But in times when the Commodore of the Tagus or the Mediterranean Squadron hoisted his flag on a wooden three-decker it certainly was. At prescribed intervals,—that is to say, so many times in such a period of time,—but at utterly irregular and unexpected moments, it was the duty of the Captain of each of her Majesty's vessels to give a sudden alarm, to pipe his men to quarters, and to put his ship in such trim as would be required for instant combat; and a register was bound to be kept of the date of each use of this precaution, of the time occupied in getting all taut, and thus of the efficiency of the crew. Such a precaution would be as useful in case of alarm from fire as in that of sudden surprise by an armed enemy. In the case of a church or theatre the plan could be only partially carried out, as public opinion would resent its application during a service or a performance. But apart from this, if it were the duty of some official,—let us say an officer specially appointed by the Insurance Companies, under the sanction of a special short Act of Parliament,—to give the alarm of fire at some unexpected moment at every public building at least once in every year, and to note with what alacrity doors were opened, shutters closed, taps turned on, or any other well-designed safeguards called into instant and effective action, more would probably be done to preserve human life from the most terrible and sudden end than by any other method that we can imagine. Nor is it only to England that we address this counsel. We trust to hear it echoed from France, Germany, America. It is worth the careful attention of the civilised world, or at least of all those visitants of churches or of theatres who object to being burned alive.

PUBLIC SAFETY IN THEATRES.*

The burnings of theatres, whether in France or abroad, when frequently numerous victims perish, have always had the melancholy privilege of profoundly moving public opinion. The frequency of these terrible disasters appears to show, of itself, the insufficiency of the precautions taken to secure general safety. On the other hand, the inquiries undertaken on the occurrence of every disaster illustrate the necessity of increasing the proper means of preventing, or, at least, of diminishing, new dangers. It appears, moreover, from the figures of a curious statistical table, that the average life of a theatre before it is destroyed by fire does not exceed 43 years.

By fits and starts administrative commissions have been charged with the examination of various questions connected with the measures of security applicable to theatres; but until of late no complete study of the subject has been made.

Wishes have been expressed, some experiments made, but in the end no important modification has been effected in the old rules. In fact, the police supervision of theatres in Paris is to-day conducted in accordance with orders framed in 1828, slightly enlarged in 1864 and 1868, by supplementary regulations now recognised as being incomplete.

As to provincial theatres, they are generally still worse cared for. Not only do the regulations as regards precautions against fires leave much more to be desired than those of Paris, but the greater part of the rules which have been laid down are less frequently observed. In short, permanent supervision is far from being exercised with so much vigilance as in Parisian theatres.

Such was the situation when the news arrived of the catastrophe at Nice, the terrible consequences of which immediately revived the apprehensions of the public by exciting them to the highest pitch.

It is under the influence of this general feeling which was re-enforced by the recent disaster to the theatre at Montpellier that a new inquiry into the measure respecting the general security in the theatres of Paris, was ordered by M. Andrieux, then Préfet de Police, with a view of revising and completing previous regulations by putting them into harmony with the progress made in recent years.

The interesting studies of the commission named by M. Andrieux have served as the basis of the proposed new regulations with regard to the supervision of theatres, the moving circumstances of which are set forth with great precision in the report submitted by the Prefect of Police to the President of the Council, Minister of Public Instruction and Fine Arts.

In this report, which is remarkable for its

* Extracts translated from *Le Génie Civil*, November, 1881, which includes some diagrams.

precision and lucidity, the various questions relative to the security of the spectators and the persons employed in theatres are discussed *seriatim*, and are clearly summed up in a series of regulations to be observed by the proprietors or directors of theatres.

At the outset M. Andrieux is to be congratulated on his resolution to treat the question as a whole. It is impossible to effect any real improvement by any mere modification of the old regulations. On the other hand, it will not do to begin everything afresh. To attain the desired end it is essential that the new regulations should fulfil as nearly as possible the conditions required, and above all that these regulations should be capable of practical application. Now if the general spirit of the *ordonnance* of the 16th of May, 1881, correctly responds to the legitimate demands of the public, it is to be feared that the enforcement of its provisions does not produce all the good that might be expected from it.

Two principal observations appear to us to result from the attentive study of M. Andrieux's report: the first is that several clauses of the new law would only remedy imperfectly the dangers which they are intended to prevent; the second is that with regard to other clauses he has not taken sufficient account of the great difficulties which would result from their application. In concluding his report to the President of the Council, M. Andrieux shows, among other things, that the difficulties to which we here allude had not entirely escaped his observation. He justly foresees that the alterations and important works desired to be made to the various Parisian theatres will encounter considerable opposition. He trusts, however, to find the necessary support to overcome interested resistance in the force of public opinion. This support will not be wanting to M. Andrieux, nor to his successor, if, as we hope, the latter persists energetically in endeavouring to carry out the indispensable improvements long since called for in the public interest.

In the analysis of M. Andrieux's report, to which we are about to allude, we shall not make ourselves the advocate of the proprietors and directors of theatres. Our aim, on the contrary, is to assist as far as we can the municipal authorities by pointing out the new measures which are desirable, as well as by modifying or restricting, with a view to a practical solution of the question, such as appear to us as utopian or would interfere with the practical working of a theatre.

Having thus defined the scope of our inquiry, we now proceed to pass in review the different questions discussed in the report of the Prefect of the Seine, following the order adopted by M. Andrieux, and accompanying each of the principal points with comments which their examination has suggested to us.

The *ordonnance* of the 16th of May, 1881, has a threefold object:—

1. To guard as far as possible against danger from fire.

2. To secure in the case of fire prompt and sufficient assistance.

3. To render as rapid as possible the emptying of the theatre.

Under the first head come measures for the prevention of fire, the construction, and position; under the second head, regulations with regard to the fire brigade; and, under the third, those having for their object the improvement of the means of exit in order to facilitate the departure of the spectators and the persons engaged in theatres.

Construction.

The isolation of theatrical buildings is admitted in principle. The separation of the whole of the theatre from the neighbouring houses should be obtained by a passage-way around it of, at least, three mètres (10 ft.) in width. As this measure cannot be insisted on in the case of old theatres, it is proposed that an independent wall (*contre-mur*) of brick shall be added to existing buildings in order to protect the party-walls from danger from fire.

It is further proposed that the three great divisions of the theatre, auditorium, stage, and administrative buildings, shall be separated by thick walls. It is further proposed to prohibit in any portion of the auditorium any workshops or store-rooms, in order to keep away from that part of the building used by the public everything that might serve as fuel for fire.

Finally, the erection of firemen's balconies in the highest part of the stage is recommended to allow the firemen to obtain complete command over this part of the house, and to make their escape in the event of danger. All this is excellent, but with the exception of the independent wall and the firemen's balconies, it is at once seen that the above recommendations can only apply to theatres to be built in the future.

Wherever a theatre is placed between houses, and the case is unhappily very frequent in Paris, it is clear that we cannot obtain the passage around recommended, because this isolated maximum of three mètres (10 ft.) in width could only be obtained by encroaching on the space (always too scanty) for the work of the theatre, and still less could it be obtained at the expense of the adjoining houses except by their compulsory purchase.

There remains, then, only the independent brick wall, which would be sufficient to preserve the party-walls, but which would not hinder the fire from spreading by means of the roof. At the time of the fire in the great theatre at Rouen, the higher stories of all the neighbouring houses were destroyed by the fire, which was communicated by means of the roofs. This danger would be greatly diminished, as we believe, by requiring in certain cases the raising above the roof of the lateral party-walls in such a manner that they should exceed the height of the highest portions of the roof of the theatre.

In the majority of the Parisian theatres the premises belonging to the three departments into which the theatre is divided are intermixed, instead of being distributed in different separate buildings. The separation of the departments by thick walls cannot, therefore, now be effected without interfering with the whole of the building. For the same reason it will probably be very difficult to obtain the transfer of the store-rooms or workshops near the *salle* to another part of the theatre, where the other offices are already too cramped. As regards the firemen's balconies, these should be placed outside of the stage; on the inside the corridors and bridges for the scenery serve the same purpose. The access to these should be made more convenient.

With regard to existing theatres, it does not appear to us at all possible to lay down any general rules. The only means of effecting any serious tangible improvement of the actual state of things is that indicated in the report, viz., to form a commission, composed of competent men, who should be empowered to make a careful and special investigation on the spot of each theatre, and afterwards to require the rigorous execution of all works which shall be specified, and are recognised as being practicable, care being taken that they are completely carried out.

As regards regulations for the construction of new theatres, their scope should, we think, be much more extended than those which are indicated in the law of the 16th of May. We cannot enter here into details as to these technicalities, which would involve us in explanations too long for the pages of a review.

Reserving for future consideration these special measures, we shall limit ourselves for the present to the following points as being necessary, viz.:—

1. Isolation, as complete as possible, of the theatre from the neighbouring houses.

2. The exclusive employment of brick for the construction of all interior walls.

3. The exclusive employment of iron for the construction of the floors, roofs, and of the framework (*ossature*) of all decorative work.

The roof should be of metal, or of slates secured on to the rafters by copper hooks, or galvanised iron.

All the openings in the proscenium should be provided with doors of solid sheet-iron, in such a manner as to permit of the isolation from the fire of the adjoining premises.

Scenic machinery should be constructed entirely of iron.

Covering in plaster of all the interior surfaces of the roofs, as well as all the small parts where wood has been necessarily used.

The establishment of a fire brigade in the immediate neighbourhood of the stage, &c.

Iron Curtain.

According to the prescriptions of the 16th of May, "the opening between the stage and the auditorium shall be closed by an iron curtain, which, being suspended by combustible cords, shall fall automatically in case of fire, and shall have counterweights to regulate its descent." The curtain here referred to exists already in nearly all the theatres in Paris. It is composed of an iron frame, divided into triangles by iron laths, and filled in with a trellis of iron wire. The usefulness of an iron curtain so constructed has been much contested.

Many persons, ourselves amongst the number, think that it does not fulfil its object, inasmuch as it does not oppose any serious obstacle to the spread of fire from the stage to the auditorium. Not only, we believe, would the bearers and the uprights on which the scenery is fixed, easily tear in their fall so feeble a trellis; but supposing even its mesh resisted the shock of heavy *débris* falling from the flies, and rebounding on the stage, it is necessary to admit that the flames attracted towards the auditorium by the flue from the sun-burner in the centre of the house would readily pass through this curtain, and would then rapidly communicate the fire to that part of the theatre used by the public.

By continuing the requirement of this curtain with a large mesh, the condition of affairs is not improved. This appears to us the more to be regretted, that remarkable progress has been made in this respect in several theatres abroad, and that improvements are on the point of being adopted in several of the provincial theatres in France.

Amongst improved iron curtains we will instance at once that of the new theatre at Geneva, composed of three thicknesses of trellis-work, separated from one another.

The frame is made of two pieces of (half-round) iron, holding a metallic gauze, with a very small mesh. This gauze, which is similar to that of a miner's safety-lamp, absolutely stops the progress of flame. But its thinness renders it very liable to be broken: hence it is protected from blows on its two sides by a double trellis-work of stout iron wire, of $\frac{1}{10}$ in. in diameter, with a $\frac{3}{4}$-in. mesh, and strongly fastened to the back of the frame. Thus arranged, this triple trellis-work evidently possesses very great resistance, and it can be assumed that it would present an effective obstacle to the spread of fire.

This iron curtain, designed by M. Diosse, master carpenter, has been in use for the last two years at the theatre of Geneva. It is rolled upon two iron drums, and counterbalanced by weights. The ascent and descent are accomplished by means of a roller, checked by an automatic brake working outside the stage. The weight of this curtain is 2,500 kilogrammes (2½ tons), and the total cost was 320*l*.

The iron curtain of the Théâtre des Célestins, at Lyons, which has just been rebuilt, is constructed after the same principle, of a sheet of thin metallic gauze, protected by two strong trellises, with a large mesh. But here, for greater precaution, the frame of the curtain is made of stout sheet iron, 2 mètres wide, in such a way as to still more completely protect the stage boxes and other parts of the house nearest to the curtain.

On account of the limited dimensions of the stage, the weight of the curtain is only 1,800 kilogrammes (1¾ ton). The entire cost has been 7,000 francs (280*l*.).

Although these curtains offer a certain security against the spread of fire, we find that they have two serious defects, of which we now proceed to speak.

In the preceding remarks we assumed the fire to originate upon the stage. This is, indeed, the most frequent, and by far the most dangerous, instance. We would almost say the only dangerous instance, for there are very few cases of fires in theatres originating in the auditorium, where the fire would be tolerably easily subdued, the combustible materials there being comparatively small in quantity.

But it is not sufficient simply to prevent the flames from entering the auditorium; it is not less indispensable, in our opinion, to prevent the smoke from spreading there. Now, painted canvas and the framework of scenes, which are always found in considerable quantity on the stage, fall to pieces immediately on catching fire, produce an abundance of black smoke, which would be drawn into the auditorium by the flue over the central chandelier, would easily pass through the finest metallic curtain, and would at once stifle the spectators, who, from the blocking of the passages or other cause, would be prevented from rapidly escaping. Facts have proved that in numerous fires in theatres the victims had died from suffocation.

It is thus of equal importance to prevent the passage of smoke into the auditorium, and to do this there is but one way. A close curtain of

iron, covering completely the proscenium opening. This curtain would, besides, have another advantage, that of hiding from the public the progress of the fire. We must insist upon this latter point, to which we attach very great importance. That which is most to be dreaded during a fire in a theatre, should it break out during a performance, is the panic produced amongst the spectators by the sight of flames. It is this which causes the obstruction of exit passages, the frantic rushes, the heaping up of bodies, and eventually suffocation.

Every suitable means for diminishing panic, it seems to us, then, should be employed, and we think that a close iron curtain, concealing the flames and presenting, as well, a serious obstacle, would contribute much to reassure the public. This is why we strongly advocate the employment of a close curtain of sheet iron, which should, we consider, be required for every theatre.

This suggestion is not an innovation, and, in adopting it, the City of Paris would only be following afar Germany, America, and shortly the provinces of our country. There existed, in fact, for several years, a close curtain of corrugated iron, of large size, in the theatre of Dresden, and in a great number of theatres of second-rate towns in the United States. In France, several such curtains are now being made, intended for the theatres of Besançon, Lille, and Toulon.

These latter are fixed according to the system patented by MM. Grafton & Co., engineers. The curtain is formed of a series of sheets of iron, which are raised one over another during their ascent, hung with hinges similar to those used for shop-shutters. The curtain is moved by hydraulics by means of an accumulator and piston working an endless chain. Without entirely approving of certain details of this system, we nevertheless consider it as a notable improvement which is to be commended.

The incontestable advantages of a close iron curtain appear to us so important, that notwithstanding the rather high price of this kind of division, we have hesitated in recommending its employment to the municipality of Rouen for the Theatre of Arts, which is now being rebuilt.

It is worked by hydraulic machinery, working by means of two pistons set in motion by two taps placed outside the stage, and forcing the water into lateral tubes. A third tap placed below these serves to empty the pipes in the event of repairs by necessity.

This solid curtain, which is in one height, weighs 4,000 kilogrammes. It will be counterbalanced by weights for nine-tenths of its total weight, and the remainder will be raised by the pressure of two columns of water, one at each side, upon which the curtain, when raised, will be supported during the time of performance.

The entire cost of this curtain, including the pipes for the admission and emptying of the water, the pistons, the guides, and the counterbalance weights, as well as the suspension-ropes of thick steel, and all the necessary fittings, would be from 14,000 fr. to 15,000 fr. (560*l.* to 600*l.*). By causing this same curtain to be worked non-hydraulically, but by means of a windlass with a self-acting break, the expense would be reduced to 9,000 fr. (360*l.*).

Lighting.

As the report by M. Andrieux states, nearly all the disasters which are produced in theatres have been caused either by an accident happening to the gas-piping or lighting apparatus through their defective or incomplete fixing.

On the stage, and especially in the flies, the danger is constant on account of the accumulation of the most combustible materials, in the midst of which are distributed a large number of movable gas-jets necessary for the changeable lighting of scenery. Gas, then, is the formidable enemy against which we cannot take too many precautions. The question, also, of replacing gas-lighting by electricity was discussed as soon as the discovery of the application of motive power to the economic production of electricity was made. It appears, unfortunately, that gas could not be completely dispensed with in the lighting of theatres; many experiments have been made but without giving practical and conclusive results.

The most that can be hoped for at present is the introduction of a mixed system of lighting, electricity being used for large spaces and certain effects of the *mise-en-scène*, and gas for small spaces. It seems reasonable, then, that the Order of the 16th of May imposes conditions with regard to both the methods of lighting.

The first condition required concerning gas is that of having a separate meter for each of the three divisions of a theatre, so as to prevent the sudden extinction of lights in the whole of the building. To prevent complete darkness in the auditorium in case of the extinction of the chandelier, it is also prescribed that the manager shall keep oil-lamps in all parts of the auditorium accessible to the public; and during the whole time of the performance a sufficient number to permit the public to see their way out.

The principle of these precautions is certainly excellent, but it is necessary that they should be properly carried into effect. And would it not be possible to arrive at the same result in a manner more simple,—in determining, for example, the general distribution of the gas, in the following manner?

The first meter should serve for lighting of the scenery and the auditorium. The second meter would supply the wings of the stage and the administration-rooms. The third meter, lastly, would light the staircases, vestibules, passages, and back rooms of the auditorium, as well as a certain number of gas-jets distributed in the interior of the house, to the various boxes and corridors, which would allow persons to see their way, even after the extinction of the central chandelier, without the necessity of any oil-lamps. This would avoid the inconvenience of a supplementary system of lighting. It would be necessary in order to complete this arrangement that three meters should be placed in a position easily accessible, and also brought as near as possible to the public way. In case of an alarm on the stage the gas supplying the footlights could be cut off at the meter; then, if needed, the gas supplying the wings of the stage, leaving alight all the internal jets of the auditorium, and the lights of the corridors.

The report of M. Andrieux goes on to say,—"That it would appear equally useful to compel the managers of theatres to execute in iron all the large gas-pipes, in order to prevent the escapes so frequent in leaden ones."

We also are in favour of the use of iron pipes for the distribution of gas in theatres; yet opinion is much divided respecting the preference to be given to iron or lead pipes.

Escapes rarely take place in the length of pipes. It is at the joints they most commonly occur, and the number of joints is about the same in the two materials.

As a matter of fact, many of the theatres of Paris have their gas-pipes of lead, and the advantage of one system over the other does not appear very marked. Is there reason, in consequence, to compel the proprietors of theatres (for it is they whom this concerns, and not the managers) to immediately replace all their gas-pipes? This would occasion a heavy expense, while the result to be obtained is of small importance.

We think that it will be sufficient to render compulsory the use of iron gas-pipes in theatres to be erected, and to prescribe their use in executing necessary repairs and partial substitution of existing pipes. This should apply to the ground-lines, and all lights should be protected by wire-guard work. These guards are already in use in the greater part of the Paris theatres.

As an improvement used lately in the apparatus of scenic-lighting, we here describe an improved float invented by M. Diosse, the use of which should be general. The ordinary floats are merely enclosed in a single tube of sheet-iron, often overheated by a number of cylindrical gas-jets which it conceals. On several occasions, in the old theatre of Geneva and elsewhere, fire has been communicated to the threads of light cloths fluttering on these almost red-hot coverings. The new float by M. Diosse remedies this danger by means of a second covering separated from the first by a current of air, preventing the overheating of the outer surface.

For the footlights the Order of the 16th of May requires the use of jets reversed, with the view of absolutely protecting the dresses of the actors approaching the proscenium. The system of reversed jets has certain advantages, but it has many drawbacks, not the least of which is that it increases enormously the consumption of gas. Moreover, the construction is complicated, the regulation of the jets is very difficult, and the rapid replacement of broken glasses during the performance is difficult. These defects, which are very annoying in practice, have caused this system to be abandoned in many theatres where it had been introduced at great expense; at the present time it is only used at the New Opera.

It seems to us that without increasing the danger, the jets of reversed flame could be dispensed with, by fixing to the reflector of the footlights the double envelope fitted to the float by M. Diosse, and in making it obligatory for all theatres to be provided with an iron wire screen placed immediately in front of the footlights, which is only used in a few theatres. Thus modified, the ordinary footlights would offer, we believe, nearly all the same guarantees of safety with that of reversed lights without their inconveniences.

A defect easily remedied would be to render obligatory the employment of metal ropes for the suspension of the float, and other apparatus of movable lighting, and also to impose everywhere the use of regulators in order to prevent a sudden lengthening of the flames at the nibs, in case of sudden changes of pressure in pipes.

With regard to the installation of lighting by electricity, the regulations are confined to requiring the complete isolation of wire for the transmission of the currents, and preserving them from breakage by enclosing them in a strong and incombustible casing. It wisely adds that precautions shall be taken to prevent the fall of incandescent carbon.

On the occasion of the experiments in electric lighting made at Rouen, we were able personally to testify to the necessity for precautions in this regard, as well as to prevent sparks flying (*petittements d'étincelles*), on account of the impurity of the carbon pencils. During a performance, the commencement of a fire, occasioned by an electric lamp, broke out on the stage of the Théâtre Lafayette. Fortunately, the accident occurred during an entr'acte, the curtain being down, and the fire was rapidly extinguished unknown to the public.

The position of dynamo and other machines for generating electricity should be the object of conditions and special authorisations.

The diversity of systems of electric lighting, and the undecided nature of their working, compel us to confine ourselves, at least for the present, to these generalities.

L. Sauvageot, Government Architect.

DEATH OF THE PRESIDENT OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the meeting of the Institute held on Monday evening last (Professor T. Hayter Lewis, vice-president, in the chair), after the minutes of the previous meeting had been read and confirmed, it was announced that the secretaries had received a letter from the hon. secretaries of the Architectural Association, in which the writers said they had seen with very much regret the announcement of the death of the President of the Institute,—a regret which would be shared by all the members of the Association. The Institute, in common with the whole profession, had sustained a great loss by the death of one of its most distinguished members. The writers desired to be informed of the arrangements for the funeral, in order that the Association might be duly represented thereat.

The Chairman,—I need scarcely tell you, gentlemen, of the event which has just taken place. But before I allude to it more particularly I have another sad task to perform, namely, to allude to the deaths of two other of our most distinguished members,—Mr. Salvin and Mr. Decimus Burton. Mr. Salvin was well known some years ago as a very earnest worker in the profession, and, having made a study of old castles, his advice was sought and taken in the extensive restorations which have taken place of late years in the Tower of London. Mr. Decimus Burton had long ceased to practise, but his principal works were very well known, and included the Athenæum and United Service Clubhouses in Pall Mall, and the entrance to Hyde Park at Hyde Park Corner. In his time no architect was better known, and none was more respected. I have now to allude to the real business of the evening. The Council, of course, could not by any possibility postpone this meeting, the sad event of Mr. Street's death having happened at so recent a period, namely, at about half-past ten yesterday (Sunday)

night. I told you at our last meeting that I had had an interview with him; I likewise read a portion of a letter from his son, and I knew at that time that the feelings of his physicians were decidedly hopeful. All signs continued to be favourable, and last Friday he was to have left town for Egypt, where he hoped to have passed some short time in entire repose. It was a new country to him,—a country which he had always hoped to see, and had he had the opportunity, he would doubtless have made good use of both pen and pencil in recording his impressions of his sojourn there. Man proposes, but God disposes. On Thursday afternoon last, while he was sitting conversing with one of his old friends, a Royal Academician, he was struck down suddenly by a severe stroke of paralysis. The whole of his left side was paralysed, and he was rendered speechless. He remained conscious for a short time after the attack, but he soon became unconscious, and so remained up to the very last. He had, I need scarcely say, every possible advantage which the skill and science of his physician and the love of his family could bestow, and I believe he likewise had the most affectionate care of his domestics. He has been too much before the artistic world for me to need to give you much of his history, and you all knew him too well, and respected him too much, to render it necessary for me to say much in his eulogy. To many of us he was known as a friend, hearty and cheery, and of ready wit, giving and taking sallies and home-thrust in a most playful way. Above all, he was sincere. Fearless in asserting his own views, he no doubt sometimes came into collision with others, and perhaps sometimes appeared to bear rather harshly upon them. But you must forgive a man who speaks and does fearlessly what he thinks. From my personal knowledge of Mr. Street for years I am able to apply to him the words which Shakspeare makes *Polonius* say to *Laertes*, for he was indeed a friend to be grappled to one's soul with hooks of steel. To all of us he was known as a skilful artist and as a most powerful writer on our art. He was a fearless champion of the views which he considered right, regardless of what others thought; and whatever the results to himself might be, he had the courage of his opinions, and stuck to them through thick and thin under all circumstances, no matter what the loss of profit or office might be. Most people knew him best by his works, and in the conduct of those works he was known as a high-minded gentleman. He was a friend of all that is true and noble in art, and the friend of all about him, sparing no exertion of any kind to advance his art. Attending to his work in the most minute details, which he looked upon as important to the carrying out of a design, he was an absolute master of every detail in his buildings. To all those who knew him well and could see him at work he was a marvel of power and of action. Most of you, I dare say, know that in that great work of his, the New Law Courts, there are hardly two windows or doors all over the building which have the same mouldings, and yet, there is not a single moulding, whether in wood or stone, which was not drawn out by him with his own hand full-size. Others will speak more worthily than I; I dare say at greater length, and better, but no one can be more sensible than I of the loss of a dear friend, and no one can feel more keenly than I do that a great power in art was lost and passed away when George Edmund Street died. Gentlemen, it is hardly necessary for me to add that the Council have passed a resolution of condolence with the members of Mr. Street's family. That resolution, which I am sure will have your hearty concurrence, is to this effect:—"That the secretaries be requested forthwith to draw up and transmit to Mr. A. E. Street a letter in the name of the Council expressive of the sorrow of the members of the Institute, corporately and individually, at the sudden death of their President, and of condolence with the family in their bereavement."

Mr. Wyatt Papworth said that the letter should be sent in the name of the Institute, and not in that of the Council merely.

The Chairman said that was, of course, the intention.

The Right Hon. A. J. B. Beresford-Hope, M.P., said,—I quite agree with that very proper suggestion, and I rise to move that that resolution of the Council be adopted by this meeting. It is a painful duty for me to perform, but I find, on looking round the room, that I enjoy the melancholy pre-eminence of being the senior past-President here. In that character, then, I venture to come forward, in this moment of stunning grief, to make myself the mouthpiece of the Institute as the Institute, and not only of its governing body. In this dreadful year 1881 we seem to have been continually walking *in tenebris et umbra mortis*, and I thank God that there are only about ten days of this most terrible year to pass away. I cannot help reflecting that it is just six weeks ago to-night that I was standing up where I stand now and addressing him who then, as President, occupied the President's chair, apparently healthy and vigorous, and who had just before delivered a grand and massive address, well-conceived, logical, well-argued, powerful in tone, admirable in composition. We all were proud of him, and could any of us have thought then that in only six weeks we should have to meet as we are meeting to-night? Really, I feel that "we have come to bury Cæsar, not to praise him," but still, something must be said. You, sir, have embodied so well, so fully, and so clearly, the great and good points of his grand character that I feel that there is very little for me to add. His honesty; his boldness; the way he conquered people by the conviction that about him was no trickery, no diplomacy in the bad sense of the word; his fearlessness and earnestness in the advocacy of what was right and true and beautiful, whether in the moral or the material world, were all grand traits in his character. He has passed away young, but he has passed away in many senses full of honour,—passed away our President, and ten years a Royal Academician,—passed away just completing *the* monumental building of our own later generation,—the building which will be, we hope, for generations after generations (if, as we hope, the British Empire and British Monarchy will go down from age to age), unless some unexpected catastrophe occurs to it, the palace in which the administration of the justice of this great empire will be carried on. He has gone, following only at a distance of a few months his honourable rival Burges. Both of them Death's trophies in this year 1881! To pile up words would only be to weaken the feeling of sorrow that wells up in all our hearts. I move that the resolution read be made the resolution of the Institute, and would suggest that after that we dismiss all other business, and separate to meditate in sorrow upon him we have lost, whom we should take as a personal and artistic exemplar in our exertions.

Mr. Horace Jones.—After the excellent speeches we have heard, I think the fittest tribute we can pay this evening to the memory of our late leader and companion will be to cease our business for the night. I therefore move the adjournment of the business of this meeting.

The Chairman said he must first of all dispose of the motion made by Mr. Beresford-Hope, but which had not been seconded.

Mr. Charles Barry, in seconding Mr. Hope's motion, said,—I am sure it must be the anxious wish in the hearts of every one here to express the feelings which individually animate us with regard to our late President. Those feelings have been well expressed by you, sir, and they have been further well expressed by Mr. Beresford-Hope, but I cannot forget, and I shall feel privileged in remembering all my life, that during the time I had the honour to occupy that chair, Mr. Street was my loyal co-adjutor as Vice-President. Much superior to myself in mental vigour and in artistic power, he yet did not feel it to be inconsistent with the powers which he knew himself to possess to support me loyally during the three eventful years during which I occupied the chair. It is known, of course, that on certain points we have felt it our duty to take somewhat different views, but I can bear witness to the absolute sincerity and honesty of Mr. Street's character, inasmuch as though we were in the position of differing on certain points, we felt for each other, and I am sure he felt for me as I felt for him, both of us being assured that the only object either had in view was to benefit the profession to which we belonged, and to add to the stability and permanence of this Institute with which we were so fully identified. Outside these walls, and beyond that official difference of opinion, our friendship, which was the growth of many years, and which was cemented greatly by the three years of our working together here, never faltered for a moment. Cordial, kind, genial, personally friendly, Mr. Street always was to those who had the privilege of knowing him well, and I hardly know how to express the feelings which I experience now at the suddenness of the stroke which has deprived us of the assistance of our distinguished late President. I shall not add any further words, but I could not be here without testifying my deep sense of the great and exceeding loss which this Institute and the whole profession have suddenly and so unexpectedly sustained.

Mr. Ewan Christian.—I am sure we must all feel that a great light has been quenched, and that a prince and leader among us has fallen. The fewer words spoken on this occasion the better, and I therefore venture to second Mr. Horace Jones's motion that we do now adjourn.

Both motions were adopted, and it was announced, as the meeting closed, that Professor Hayter Lewis, as the senior Vice-President, and the two secretaries, had been appointed by the Council as a committee to take such immediate steps as they might deem necessary to do honour to the memory of the President, and to make known, as far as possible, the arrangements as to the funeral.

THE WESTMINSTER PLAY.

IN these days, when theatrical matters absorb so unusually large a share of public attention, it can be understood that the Westminster Play is not likely to have lost any of that interest which it has for so long excited in certain circles. The Westminster Play is thoroughly well understood as the classic play acted by the Westminster boys in accordance with a time-honoured custom observed for generations past in most schools throughout England, and which now seems definitely to have taken root on the other side of the Atlantic, where the oldest of the American universities, Harvard, mounted, not long since, the "Œdipus Tyrannus," with a luxury of costume which, if we are to believe the series of illustrations that appeared in an American magazine, approached as nearly as possible the Greek ideal. But dramatic power we can scarcely look for in the schoolroom, and the "Œdipus" even of Harvard, with all its care, we may be sure fell very far short of the play which, in a French translation, was put on the stage of the Théâtre Français not long since, and interpreted, as the play requires, with masterly skill by a well-known artistic company.

It is scarcely in a critical mood that one visits the old dormitory of Westminster School, which is annually fitted up for the play, and on the dusky walls of which are scored, scratched, and painted so many of the names of old Westminster boys, forming, it is true, not so architectural a wall decoration as the painted armorial bearings of past *alumni* which crowd the staircases and passages of the old dormitories of Padua and Bologna.

The play chosen this year by the Westminster boys was Terence's amusing comedy of the "Adelphi; or, the Brothers," an old favourite, "conveyed,"—to employ a word now in use to express a practice as well known in the days of Terence as in our own,—from the Greek of Menander. As may be imagined, the success of Thursday, the 15th inst.,—the first night of the series of three performances of the play,—was great, and it scarcely required the well-measured and traditional admonitions of the "god-keepers," with their long canes, to prompt the applause of the audience; the brilliancy and quickness required in the action of the play, could not, of course, be expected from scholars, even less experienced than what are so generally understood in this country as amateurs. The comedies of Terence are singularly modern in their spirit, as any translation will show. We hear, or rather have heard, a great deal of the need for the revival of our fine old plays, many of which are not improperly regarded by some as fine old bores, but the Greek wit and wisdom of Terence, Roman though he was, tells as well now as it did when, centuries gone by, it roused the mirth of audiences to whom the language of the poet was familiar, as still, for centuries to come, the well-weighed sentences will supply an ample fund of thought and worldly wisdom to the reader. If, as Mr. Russell Lowell told us the other day, quoting an American proverb,—taken over from our country,—there is a great deal of human nature in man, we are still the men whom Terence studied, for whom he wrote.

It would be perhaps asking too much from the Westminster boys to expect that, in addition to the representation of a classic play, they should give us between the acts classic music. The audience would be exacting indeed who required, to accompany the "Adelphi" of Terence,

the quick music of the Sarranian flutes, which, we are told, with freedom, Flaccus composed originally for the piece. Bizet's "Carmen" and Mr. Sullivan's ever-popular "Patience" formed, perhaps, a better substitute more in accordance with that good-humoured indulgence with which we now are expected to receive the "waits" between the acts. As a matter of what our French neighbours term *actualité*, the chief interest of the Westminster Play for most persons is centered in the epilogue, which, contrary to custom, was given on the first night.* Here enters the charm of novelty, for the epilogue deals in choice modern Latin, with a variety of contemporary topics. It can be easily understood that the epilogue this year did not neglect to touch in amusing terms on the Irish question, and loud was the laughter raised by a variety of the political "hits" made; but the heartiest and most prolonged applause of the whole evening was reserved to the *finale* of the epilogue, when a huge packing-case, duly labelled "*cum cura*," was hauled on to the stage amidst various timid suggestions made that the package might prove to be an infernal machine, but from which was eventually dragged a large model of Ashburnham House (restored). The well-composed and warm words which accompanied this discovery were interrupted during several minutes by the applause of the whole room, renewed when the determination was expressed to preserve as an honour and glory to the school this choice architectural relic, the threatened destruction of which has justly roused so much indignation in all quarters.

THE KING OF SPAIN'S COMMISSIONER ON ENGLISH ARTISANS' DWELLINGS.

Señor Mariano Belmas, the special envoy of the King of Spain, has now returned to Madrid to report to his Majesty the result of his inquiries relating to the artisans' dwellings of England. Señor Belmas is the editor of the *Revista d'Architectura* and secretary of the Central Society of Spanish Architects. Some months ago a congress of architects was held at Madrid under the auspices of this society, and the king presided in person at the sittings; taking not only an active interest in all the debates, but delivering the opening speech. This oration was more than a mere display of that eloquence and fluency of speech for which Don Alfonso is now renowned. The king, by insisting with much earnestness and at great length on the importance of providing suitable dwellings for the poorer sections of the community, initiated a movement which must bear beneficial results of a most practical description. It fortunately happened that Señor Belmas, who, as the secretary of the congress, was brought into frequent personal communication with the king, had not only studied this question, but made several experiments in the outskirts of Madrid.

Utilising the sand which abounds in the neighbourhood, Señor Belmas mixed it with cement and formed a sort of concrete with which to build the main portion of his walls, and thus reared a number of little houses which only cost 100*l.* each, and this included the cost of the land, estimated at 20*l.* for every house. These houses consist of two floors and four rooms, with ogival roofs, a form Señor Belmas found to be cheap, strong, a little more elegant, and affording great facilities for ventilation.

The discussion during the congress so interested the king, that he determined to send some competent person to England and to the United States to inquire what had been done in those countries to provide dwellings for the poor, and, in selecting this envoy, his choice fell not unnaturally on Señor Belmas. But as, considering the somewhat troubled condition of Spanish politics and finances, it would have been difficult to have obtained a Government grant for this purpose, the king resolved to defray the cost of this mission from his private purse. It was, therefore, as the personal envoy of Don Alfonso, and not as the emissary of the Spanish Government, that we had the honour of welcoming Señor Belmas on his arrival in London; and before his departure we were not a little curious to know what were his impressions. In the fulfilment of his mission, Señor Belmas conscientiously visited the estates of the Artisans' Dwellings Company, the Peabody Buildings, and many other model and recent creations; but, so far as the economy of building is concerned, he failed to discover anything important that could be imitated in Spain. Spanish customs are so radically different that it would be extremely difficult to create on a large scale special dwellings for the poor. In Spain the poor live with the rich and under the same roof. The first-floor or flat of a Spanish house will be rented to a wealthy, perhaps an aristocratic, family; the second-floor to a family well-to-do, but not so rich; the third-floor, divided into two separate apartments, would be occupied by lower middle-class tenants; while higher up, each room is let in separate tenements and occupied by workmen and their families. Of course, according to the general character of the house, the various tenants are more or less wealthy or high-class; but, however noble or however humble the dwellings, the diversity of position between the inhabitants is always in about the same proportion, and as we ascend the stairs so we, in equal ratio, descend the social scale. The Spanish people would not tolerate any system that parks off various classes into various districts, like different breeds of sheep, in separate pens. The mixing of different classes under one roof is an important factor in Spanish life, and in no country does the maxim, "Charity begins at home," apply more appropriately than in Spain. The wealthy occupants of the first floor have only to ascend the steps of their own house to find worthy objects of compassion in the attics. This, indeed, gives rise to considerable familiarity between rich and poor, and the ignorance and indifference too often shown in other countries as to the condition of the poor are less prevalent in Spain.

Under these circumstances, any system of dwellings which would compel poor people to live together would certainly occasion considerable opposition. They would naturally object to be severed from their wealthy neighbours, who so often prove themselves useful friends in the hour of need. These observations apply, at least, to large towns, but not to the neighbourhood of factories, mines, and other industrial districts, where of necessity colonies of work-people must be grouped together.

Of the model dwellings in London, Señor Belmas was specially impressed by the most recent Peabody buildings, where turrets disconnected from the main part of the dwelling contain the closets, &c. He also spoke very favourably of the Shaftesbury Park Estate, so far as the general scheme is concerned, but found the structure of the dwellings somewhat flimsy, while it seemed to him that the land of the Queen's Park Estate was very damp, and that some of the houses were being built on refuse. With these exceptions, the Spanish delegate had nothing but words of praise to utter relating to what he had seen, to the facilities afforded him, and the hearty reception he had received. The readiness with which all documents, reports, and balance-sheets relating to all enterprises having a public interest were communicated to him, afforded a favourable contrast to what would have been done in Spain. The printing by municipal or local authorities, and free circulation among the public, of reports relating to all administrative questions, the way in which criticism was accepted, and even courted, were striking and admirable features of English life.

But the one point, surpassing all others, that will constitute the principal feature of the advantages resulting from Señor Belmas's mission, is the impetus it will give to the introduction of sanitary reform in Spain. In this respect, an entirely new field of action has been opened out. Everything Señor Belmas saw was new to him. In Spain no effort whatsoever is made to prevent the admission of sewer gas into dwellings. Intercepters, methods of ventilating house-drains, the care with which closets are ventilated, and, if possible, placed without the walls of the dwellings, the mortality statistics which establish the necessity of taking these precautions, and the saving of human life resulting when they are efficiently carried out,—all this was new to the king's delegate. Fortunately, the novelty of the subject did not militate against its importance. Señor Belmas was fully aware of the gravity of this topic, and had already joined the Madrid Sanitary Society; but had had no opportunity of studying the practical details, the mechanical appliances, which in this country have attained a comparatively high degree of perfection. Nor was he aware of the rigour of our law with respect to disinfection, and the remedying of unwholesome dwellings. All these matters will now, however, be skilfully laid before the King of Spain, and action will doubtless soon be taken. The high death-rate in Spain, the dangers we run of contracting typhoid and other fevers when we visit that interesting country, give us a personal as well as a general interest in this prospect of sanitary reform; and we are glad to think that the king himself is likely to take the initiative in this movement.

NOTES FROM THE WEST.

Steam having been used on one section of the Bristol tramway for a year, has been this month superseded by horse-power. A great many complaints were made by occupiers of property adjoining the route of the noise, smell, and inconveniences attending steam-working.

A company has just been formed in Bristol for supplying electric lighting and electricity as a motive-power on the Brush system, Lane-Fox incandescent lamps being used for domestic purposes.

Messrs. D. Glass & Co. have had extensive premises erected for them at the union of Clare and New Baldwin streets. The design is effective, and displays a series of carvings representing tobacco growing, importation, and manufacture. Mr. H. C. F. Hansom was architect, and Messrs. W. Cowlin & Son, the builders.

A peculiar dispute has arisen between Messrs. G. C. Ashmead & Co., one of the oldest firms of surveyors in Bristol, and the St. George's Local Board. St. George's, a district of about 30,000 inhabitants, just outside the Bristol boundary, a few years ago connected its drainage system to that of Bristol, and Stapleton, another large country parish adjoining, unable to satisfactorily dispose of its sewage, arranged to connect with St. George's. Messrs. Ashmead drew out the levels, which they calculated from a "bench mark," the elevation of which had been ascertained years ago, and fixed by the firm in Stapleton-road. On the work being gone on with, it was found that the sewers would not connect, the Stapleton end being lower than anticipated. Messrs. Ashmead could only account for the error in the calculations by assuming that an extensive subsidence had occurred in the district in which the "bench mark" was placed, but agreed to leave themselves in the hands of the St. George's Board, and were required by that body to pay 200*l.*, this being one-third of the expense attendant upon the mistake. Since then it has been clearly proved that the subsidence conjectured had taken place. It extended over a length of road of not less than 600 ft. or 700 ft., and the deepest sinking was as much as 2 ft. 3 in. Near the "bench mark" the subsidence amounted to 1 ft. 10 in. This being so, Messrs. Ashmead decline to pay such a sum as 200*l.*, but the Board argue that they had nothing to do with the "bench mark," and have resolved to enforce their claim.

A rather interesting discovery has been made at Gloucester Cathedral. A memorial brass being moved from the north-western transept, where it was trodden upon, to another part of the building, an excavation was made, and the workmen came upon a massive slab of freestone, 8 ft. long, 5 ft. wide, and 6 in. thick. It was found to be the memorial stone of one of the abbots, turned face downwards, it is thought, by the Puritans, before the present raised pavement was laid down. Examination of the stone leads to the belief that it is that to the memory of Abbot Thomas Horton, who governed the church twenty-six years, and resigned 1377. During his long term of office he provided the abbey with many vestments, and gold and silver vessels and candlesticks for the altar, and caused a great part of the presbytery, the St. Paul's aisle, and the guest-hall to be made.

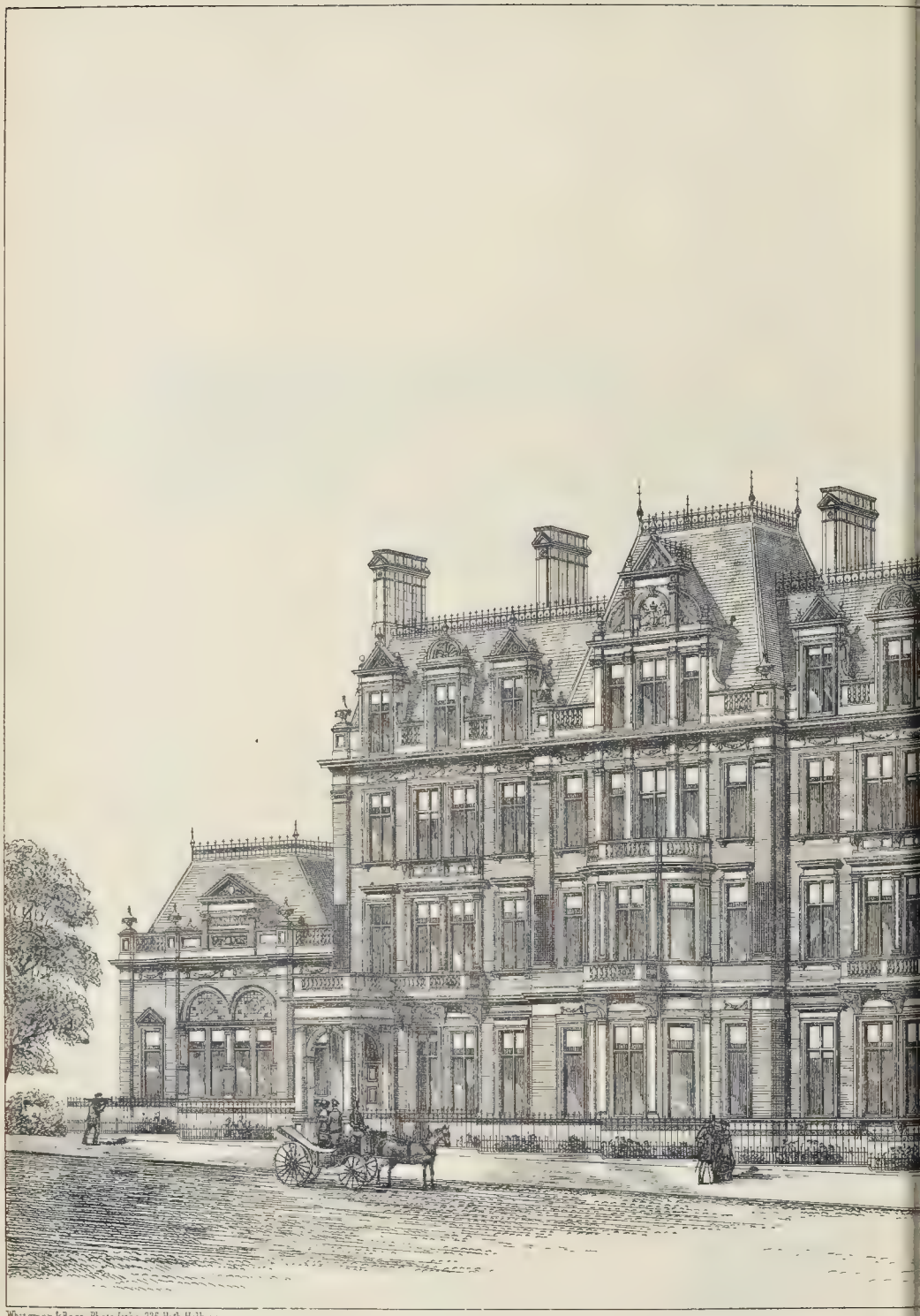
Fires in Theatres.—The Glasgow Justices of the Peace have issued recommendations to theatrical managers to have separate exits for each class of audience; to inspect the whole theatre before the performances begin; to see that the appliances for extinguishing fire are in proper order; to cause the lights in the lobbies and stairs to be supplied from pipes different from those supplying light to the auditorium. The Lord Provost recently intimated to the Glasgow Town Council that the magistrates had visited all the theatres and made suggestions for the public safety. The lessee of the Glasgow Royalty Theatre has already introduced oil lamps into all the stairs and lobbies of his theatre.



Whiteman & Bass, *Photo-Litho* 236 High Holborn

NEW CHURCH, OAKLANDS, NEW ZEALAND.—Mr. H. Nathan Smith, Architect.

Wyman & Sons Printers 74 Queen St



Whiteman & Bass *Photo Litho* 236 High Holborn

PROPOSED ALDERSHOTT GRAND



Wyman & Sons, Printers, 6 Queen St.

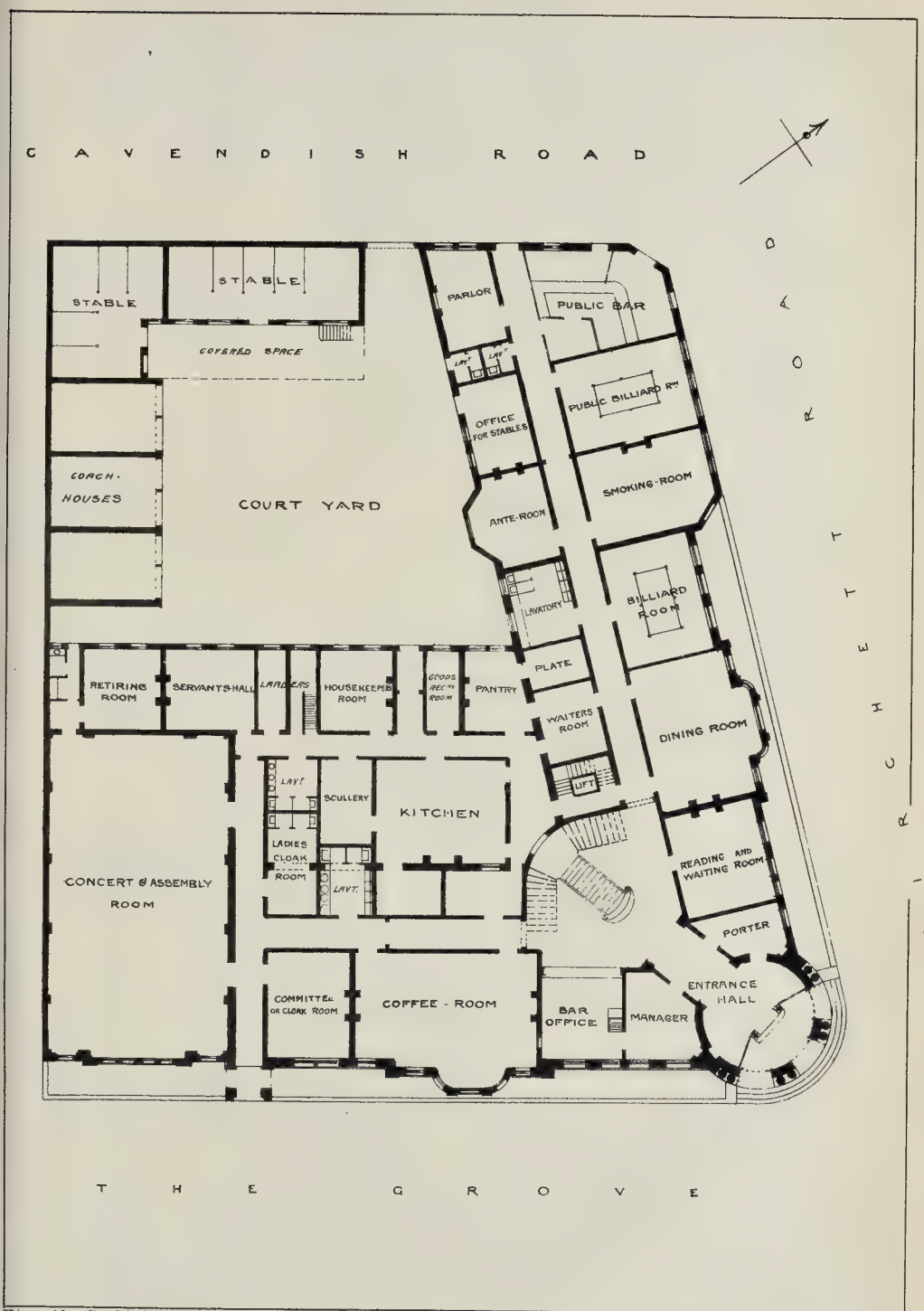
—Mr. Geo. Edwards, Architect.



COURT OF THE "PALAZZO VECCHIO," FLORENCE



NAMENTATION BY MICHELOZZO MICHELOZZI, 1391–1472.



Whiteman & Bass, *Photo-Litho* 236 High Holborn.

Wyman & Sons Printers G^t Queen S^t

PROPOSED GRAND HOTEL, ALDERSHOTT: *Ground Plan.*

NEW CHURCH, OAKLANDS, NEW ZEALAND.

THIS church will accommodate 500 adults, and is of brick, with stone dressings. The interior will be faced with red bricks, relieved by stone bands. The actual cost is not ascertained, but will be about 9,000*l*. A marble reredos will be added at a future date. The building is expected to be finished about July or August next year. Mr. H. Nathan Smith, of Manchester, is the architect.

COURT OF THE "PALAZZO VECCHIO," FLORENCE.

IN reviewing recently M. Yriarte's splendid book, "Florence," we gave several illustrations of the city. We add to these, in our present number, a view of the Court of the Old Palace. This shows it, not as it was designed by Arnolfo di Lapo, about the year 1298, but as it left the hands of Michelozzo-Michellozzi, about 1434. Other decorations, including some fine frescoes, were executed on the occasion of the marriage of Francis I. and Jane of Austria, 1565. The fountain by Verocchio is a work famous in the history of sculpture.

THE ALDERSHOTT GRAND HOTEL.

THIS building is about to be erected for the Aldershott Grand Hotel Company on a corner site close to the railway station and South Camp.

The building will contain, besides the accommodation shown on the ground-plan, in the basement,—spacious wine, beer, and coal cellars, and the heating apparatus; on the first floor, suites of rooms; and drawing-room over the principal entrance. The bedrooms will be sufficient for 100 visitors, exclusive of servants. The kitchen offices are one story high, with top lights.

The style is French Renaissance; the circular corner and tower are placed to break the acute angle.

The walls are faced with red bricks; all the architectural decorations being stone, except the large pilasters above the ground-floor, which are formed in the brickwork.

Messrs. Martin, Wells, & Co., of London and Aldershott, are the general contractors; and Mr. George Edwards is the architect.

COLOUR IN ARCHITECTURE.

THIS was the subject of an interesting lecture delivered on Monday evening last in the Theatre of the London Institution, Finsbury-circus, by Mr. George Aitchison, A.R.A., who said it was almost self-evident that the first worship of beneficence must have been the worship of the sun, the source of light and warmth, and, proximately, of vegetation; while night, with its cold and darkness, was the evil deity. Each thing that added pleasure or profit to existence was an *avater* of the Great Beneficent, while the storm, the tempest, and the water-spout, the beasts of prey, the deadly snakes, the venomous insects, and the poisonous plants, were incarnations of the Evil One. When the first shrine or temple to the sun-god was made, it seems likely that those colours that were most striking or most prized were lavished on the deity or the temple; and it was dependent on the mood of the worshipper or the priest whether the same colours were lavished on the temple of the Evil Deity, or withheld; whether he was to be propitiated by having the same attentions lavished upon him as upon his rival, or whether the temple was to strike the proper awe or horror on the suppliants. It is probable that from their beauty, their brilliance, or their rarity, certain colours got appropriated exclusively to religious use, and were afterwards relegated to or seized upon by the chiefs and their families,—the imperial yellow of China, or the purple of Rome, for example. Fortunately for us, there are the traces of colour amongst the ruins of Babylon and Nineveh, and we still have the colouring of some of the temples in Egypt; but it is almost useless to speak of colour unless it has been seen by one's own eyes, and in its proper situation. That which looks crude and harsh when brought close to the eye, in full light in a climate like our own, may have the greatest richness, splendour, and harmony in its original situation, with a mighty "contiguity of shade," and under a burning subtropical sun. The scheme of Egyptian colouring might be described as bands and patches of brilliant colouring on a white ground. Sir Frederick Leighton, who has seen the temples of Upper Egypt, describes their effect as fairy-like, not that of a rich sustained magnificence, but like that of a flight of lovely butterflies, and he dwells particularly on the method of lighting, the sun pouring in from high aisle windows, so that the whole nave is lighted up by reflected light. That the Greeks painted their temples and statues, or at least portions of them, we know; and by some, that painting has been described as crude, garish, and vulgar; but in the case of temples we have to consider this point: Was the colouring a fair specimen of Greek taste, or was it done solely to please and attract the herd of vulgar worshippers? Mr. Watts, R.A., was with Mr. Newton when he was carrying on the excavations at Halicarnassus. A large slab, now in the British Museum, which formed a part of the tomb of Mausolus, was turned over. On its face was a wide floral border, and the whole of the ornament was painted with vermilion and golden yellow, on a ground of greenish-tinted ultramarine, and under the blazing sun Mr. Watts declared that the effect was magnificent, and his were the only cultivated eyes that ever saw it. It was carefully covered up for Mr. Newton to see on his return some few hours afterwards, but on being uncovered the whole colouring had vanished. After describing some Oriental and Italian coloured exteriors, the lecturer proceeded to consider roughly the schemes of internal decoration, of which, exclusive of stained glass, it might be said that there were only three divisions,—Firstly, the fully-coloured, where white and the very pale tones were used as jewels on a generally rich half-tone. The second scheme was that in which a white or very light-coloured ground was wholly enriched with ornament. In the third scheme a white or very light ground was only partially enriched by spots, bands, or cartouches. The effects produced would greatly vary with the materials used: greater limpidness, depth, and richness would be attained when polished marbles, glazed tiles, and mosaic were used, than when a similar effect was sought by the use of fresco or distemper, or even by the use of oil-colour. The most perfect examples of full coloured decoration which the lecturer had seen was the interior of St. Mark's, Venice. Perhaps the next most splendid example was the Under Church at Assisi, painted in fresco; while the third was probably the Council Chamber of the Doge's Palace at Venice. The Church at Subiaco, and the Arena Chapel at Padua, were fine examples. The house of the Sheik-el-Islam at Cairo was a fine example, and doubtless, if Owen Jones's restorations of the Alhambra were correct, so was the Alhambra itself. Of the wholly decorated buildings on a white ground, the lecturer could not recollect a single good example, but of the partially decorated, the Church of St. Anastasia at Verona was cited as a very perfect example. Stained glass was of itself the most perfect vehicle for the highest form of colour. It might possibly be objected that that pre-eminence belonged to painting in oil, and it was difficult to conceive anything more gorgeous than some of the colour of the masterpieces of the world; but the stained-glass windows of the twelfth and thirteenth centuries were like a glory of every lovely tone and colour that exceed imagination, like the liquefaction of every conjunction of every lovely gem. Where there was stained glass in its fullest perfection no farther colour decoration was needed, though in certain rare instances it did not greatly interfere with highly coloured decoration, as was to be seen in some of the mosques at Cairo, and at the Sheik-el-Islam's house. Having referred to the plumage of birds, the lecturer expressed the hope that brilliant composers in colour might again spring up amongst our race. Colour, like music, would lend itself to any words, still, it was well to have it set "like perfect music unto noble words." From the peculiar position we were now in, mankind having but just completed an upward step in physical acquisitions, we had not yet re-learned to love the beauty of anything, so that all we could get was what some other people once thought or now think beautiful, instead of having what we love or think beautiful ourselves. In interior decoration the one great rule should be that when the eye is half closed there is but a delicate suffusion of the particular coloured tone we wish to predominate; and in any perfect system we want a small portion at least of pure white and of pure black, as a scale by which all other colours and tones may be measured; but that need not prevent us from making any deep recess or portion, that is so cut off as to make itself a separate object, a spot of brilliancy or coloured loveliness. As far as the external decoration of buildings is concerned, the lecturer was prepared to admit that greater dignity might be obtained by a light monochrome, than by any other means; and it was obvious that where great beauty of form and exquisiteness of line were required, colours were apt to draw off the attention from that which was too precious to be lost. Still, he would fain see our streets filled with houses of some more cheerful and beautiful material than dingy brick, with its patina of soot and dust. Coloured tiles and earthenware seemed to afford the means for this indulgence. For more costly buildings, polished granite, porphyry, serpentine, and bronze might be used with happy effect. All the marbles perished too rapidly in our damp atmosphere. In conclusion, the lecturer said he had longed to see the walls in our fine public buildings which were protected by porticoes adorned with splendid mosaics on a deep blue or a golden ground, as the case might be, on which some grand episode of our nations history might be portrayed by some of our great artists, and their interiors also enriched by gorgeous friezes and splendid panels.

AN IDLER AT BRIGHTON.

AFTER reading the interesting account given by you last week of the Domestic and Sanitary Exhibition in this "city by the sea," I thought I would take a stroll to the Pavilion and look at it. You once did me the honour of publishing a few notes of mine on the Paris Exhibition, and I thought, therefore, your first article having entered into the more scientific part of the question, you might find a small space for the few lighter and more frivolous observations of a mere looker-on.

Having seen many exhibitions, I was prepared to be disappointed, but was agreeably surprised. Small, compact, bright, and clear,—it is a most admirable *multum in parvo*,—enough to give people not deeply learned, or who have not studied these matters much, a desire to know more, yet enough also to give the really earnest people a feeling that they can, figuratively speaking, pat it on the head and say, "Well done." It is interesting as being the largest exhibition known in this town, nearly 300 firms being exhibitors, and it has been the means of bringing home in a pleasant and easy way to the minds of a large concourse of people the various later discoveries and improvements in science. We think, though, that as the basis gone on that it is to bring all this home to the minds of the people at large, and that as to the very poor a shilling represents a large amount, two days should have been set apart ere it closed, and the rate of admission reduced to threepence.

After a glance at the various stalls and the food products, art decorations, sanitary improvements, and machinery, I could not help thinking that a bright little exhibition of this kind, which whilst it instructs amuses, opened now and then in Bethnal-green, Shoreditch, and other outlying parts of our great city, with a merely nominal entrance-fee and some entirely free days, would do more to bring home to the people certain sanitary facts, and make them understand more clearly how much depends on themselves, than a hundred mere lectures from the tongue of a lecturer, charm he never so wisely.

There is no doubt that a certain additional Government force put on landlords and builders, to compel them to see the original architectural and sanitary condition of a house is as well organised as it can be, is wanting. But even that would be of no avail, merely spelling ruin to these two classes if the inhabitants themselves are as ignorant and as dirty as the "masses" in every country generally are. And a palace with every perfected and modern improvement would soon be but an Augean stable if the inhabitants themselves be "but as the beasts that perish." It is then by making them clearly understand how much comfort, combined with saving to their own pockets, can be brought about by adopting good arrangements and inventions that philanthropists and scientific men will be best able to put their sweeping reforms in motion.

The exhibition itself is so well arranged that no time is wasted. With a courage worthy of so good a cause, and disdaining the horrors of a fit of indigestion looming in the distance, I pass from stall to stall, tasting beef in varied forms

of condensation. Some is given me as soup, steaming hot; some I take in cold water. This latter is meant to try and beat all the beef "compressists" known, four pounds of meat being reduced to an extraordinary small space. Excellent as it is, a thing may be of the earth, too earthy, and of meat, too meaty, and all condensed food to my palate is so: therefore I rush on and quaff with gratitude a glass of sparkling Ferrozodone a friendly hand holds out. I refrain from accepting another invitation to taste some excellent, they say, Curaçoa, manufactured from something that is not the real thing, though it looks like it. On every side the energetic exhibitors offer products of all sorts,—butter, wheaten bread, sweets, lime juice, &c. I pass the oysters in their tanks with a friendly nod, and still, like the busy bee gathering honey all the day from every opening flower, accept cakes of terrebene soap, the use of which I am assured will make the washee handsome or beautiful, as the case may be, for ever. The air is redolent with the jets of perfume; books, cards, &c., are (as the divine Williams says greatness sometimes is) thrust upon one. After pausing to admire the splendid potatoes raised from the seed Mr. Sutton sells, and wishing poor Ireland had sown and reaped such fruit as this instead of rebellion, bloodshed, and famine, I pass rapidly to the decorative arts. Crockery and pottery from Staffordshire and Worcester can well bear their juxtaposition with some from Austria; all are beautiful. Painting on silk, satin, tapestry, wood-carving, modelling, amongst which a mask by a young Brightonian, Mr. W. H. Caddy, is noticeable; the Lincrusta-Walton wall decoration, which bears washing; Messrs. Mayall's electric-light photography in indelible carbon; and a hundred other things, are all interesting.

In the scientific department, from every kind of machinery meant to save time and labour; from wonderful cooking apparatus, smoke-consuming stoves; from the telegraphic signalling apparatus exhibited by the Brighton Railway Company; from electricity in domestic matters (one arrangement, notably, an ingenious street fire-alarm, by which, by pulling a bell, the locality of the fire is indicated to the central fire station); from the chronograph, the first of its kind, I believe, in England, that Mr. Douglas, of Stourbridge, exhibits, which not only registers minutes and seconds, but so small a space of time as the 300th part of a minute, down to a pen, which, if you only dip it into water, writes in ink, and which is supposed to last two years; all is instructive and interesting, and we can earnestly congratulate the promoters of the Congress on the well-deserved success of their well-organised scheme.

C.

ARCHITECTURAL ASSOCIATION.

At the ordinary meeting of this Association, on the 9th inst., Mr. Aston Webb, President, in the chair, twenty-six new members were nominated.*

Mr. Cole A. Adams then read his paper on "Barnacles," the substance of which we printed last week.

In the discussion which followed,

The President said that Mr. Cole Adams had favoured the Association with a very valuable and interesting paper. With regard to the memorial on competitions, the success of which was so largely owing to the labours of Mr. Adams, it was already having a great deal of good effect by the now very frequent, if not universal, adoption by competition committees of the suggestion for the appointment of a professional referee in each case. Mr. Adams had taken a wide view of the whole architectural world, and given his opinions on its present condition. One of the points upon which he had commented was the confusion of styles which now reigned, and which all must lament. It was to be hoped that out of the confusion would arise some new and satisfactory development. During the progress of any new movement which took place, the principles which underlay it were not usually known until afterwards, and the actors in such movements were not usually the men to formulate those principles. As an instance, Turner painted his pictures, but Mr. Ruskin followed out the principles on which they were unconsciously painted. In regard to architecture, Mr. Adams recommended the system of consulting specialists. They were to be, as he (the President) understood, in the profession, though not exactly of it. He hardly saw how that would work, because a man who devoted all his attention to one speciality,—drainage, for instance,—could hardly be a full architect. Then the system of employing specialists would, if he understood it aright, be very expensive to the client; for if different men were to be employed for every speciality, such as warming, drainage, and so on, the professional remuneration would amount probably to 10 or 12 per cent. upon the outlay instead of 5 per cent. In relation to the competition question, while it was very desirable to insist on the appointment of a professional referee to report upon the designs submitted, it would greatly add to the value of the concession if the referee were appointed at the very outset, so that he might draw up the conditions.

Mr. F. H. A. Hardcastle said that Mr. Adams's paper was exceedingly well conceived, and contained a great deal of excellent matter. With regard to perspective drawings in competitions, the evil referred to seemed to have over-reached itself. Perspective drawings had been so misused and abused for competition purposes that it was very common now in competition conditions to find them expressly excluded. Now he thought that their total exclusion was to be deprecated, for it was but reasonable to recognise the fact that other people besides the professional assessor,—those, for instance (or their representatives), who find the money for the buildings,—had an interest in seeing what the proposed buildings would be like. It was only from a perspective drawing that a non-professional person could judge of the appearance of a proposed building, and therefore, if the perspective view was fairly and honestly drawn, and was not a purely fictitious affair, it would form a very valuable and important part of a set of competition drawings. As to specialists, they were already employed in some directions. Sometimes when an architect had a large building to erect he had a somewhat hazy idea of how he was going to construct his ironwork, and he went to a specialist and said, "Here are my plans and drawings; look at them and tell me what girders should be put in, and what you will do them for, and I will include your price as a provisional sum in the contract." That was a perfectly straightforward method, and it had its advantages, and it did not take out of the architect's commission a fee for the work. If, however, the architect called upon a consulting engineer for advice as to what he was to do, he must either pay him out of his own pocket, or must contrive to include his fee in the charges for lithography of the specification, or something of that sort, which of course would not be a straightforward and satisfactory course to pursue. Mr. Adams's remarks upon sanitary science, although they followed the line of observations which had been frequently made before, it would be impossible too often to repeat or too strongly to insist upon. It was perfectly certain now that the profession must be alive to the fact that people who employ architects often know a great deal about science. Science during the last twenty years had become so generally a subject of study with every decently-educated person that if an architect did not know anything about sanitary science he would be likely to find his client greatly shocked at discovering that his (the client's) knowledge of the subject was greater than that of his skilled professional adviser. As to the unfortunate speculating builders who were responsible for so much bad work, and who were sometimes blamed for a great deal more than should be laid to their charge, he was very glad to hear Mr. Adams's allusion to the ground landlords, for undoubtedly one great reason why we had such miserably-constructed houses was the short-lease system. How on earth could it be expected that a man should incur the cost of erecting a house capable of lasting for two or three hundred years upon land leased to him for only eighty or ninety years? As long as the pernicious system of short leases continued, so long would the houses of the masses of the people continue to be run up in the flimsy and depressing style which was so much to be deplored.

Mr. Sydney Vacher, in proposing a vote of thanks to Mr. Adams for his paper, said that a great deal had been said about the necessity of resorting to specialists, but specialists not only existed, but were largely resorted to. A specialist for writing a specification, when the architect was busy, was the quantity surveyor. For heating, ventilation, fire-proof construction, &c., architects took the advice of firms who had made those subjects their special study and business, and who could not only give advice, but carry out the work, with, perhaps, a "fad" or two introduced by the architect, which might (or might not) be improvements. In his opinion, to resort to practical trade specialists was generally sufficient. As to perspectives in competitions, in one or two competitions recently given, the picture line had been given for the perspective, but in his opinion it would be preferable to give the line of sight.

Mr. Hampden W. Pratt, in seconding Mr. Vacher's proposition, said he thought the Association was very much indebted to Mr. Adams for his encouraging paper, the keynote of which seemed to be that if architects were to be worthy of the name they must be thoroughly in earnest in striving to do all their work well. With regard to sketches made during travel, he thought with Mr. Adams that they would be all the more valuable and useful if dotted with "barnacles" in the form of figured dimensions. Mr. Adams's observations about speculating builders were very suggestive, and seemed to show that the responsibility for the bad building of the houses of the people did not rest so much upon architects as Mr. Street implied. Touching the question of competitions, the preliminary sketch competition system seemed to have many "barnacles" attaching to it. If the double-competition system was going to be generally adopted, it was not desirable to make the competitors go over a great deal of the ground twice, and if it were to be insisted upon that a competitor must not, in the second competition, deviate in any perceptible degree from the design submitted by him in the preliminary competition, the system would work its own death. When there was a preliminary competition, very little work, compared with what would be necessary in the second competition, should be required.

Mr. Charles Smith, in supporting the motion, said there was a good deal of common-sense in the remark that clients nowadays appreciated science a great deal more than they did. There might be some architects who could with impunity neglect to give due attention to the sanitary details connected with building, because they might have a numerous *clientèle* who employed them for other matters, but no young architect would find that it would pay him to neglect sanitary science, and he was very pleased that Mr. Adams had so vigorously hammered in that truth. As to the employment of specialists, everybody knew that there was a great deal of specialism involved in the working out of any contract, especially for a large building, and it seemed to him that the tendency towards specialism in building must increase as time went on, and as the wants of the public became more complex. He had been very much amused with an article which appeared in the *Spectator* a few weeks ago, in which the writer suggested that the builder of a house should be made responsible for everything connected with it, he employing the architect among other specialists whose services would be required in its erection. He had heard that idea broached by men thoroughly interested in the progress of art, and he had even heard it suggested that in architecture one man should make the plan and the other should clothe it in an artistic garb in the form of architecture. It was, in fact, deducible from experience that many architects who were thoroughly wrapped up in art-matters were not sound in planning; while, on the other hand, there were many good schemers in planning who were nowhere in art matters. When a man combined the two faculties, skill in planning and excellence in design, the result, of course, would be more satisfactory than could be achieved by a division of the work between two persons.

The vote of thanks having been passed,

Mr. Adams, in replying on some points raised in the course of the discussion, said that his

* At the previous meeting sixty-two members were elected, viz., Messrs. M. Collins, C. S. Cornish, F. Ward, F. W. Lane, A. E. S. Whitelock, F. A. Dry, F. A. R. Willey, J. N. Hamilton, S. H. Davies, G. H. Oakley, L. Dawson, F. A. Huntley, F. Macey, J. E. Newbery, W. R. Lawrence, W. Duffett, C. Turner, R. Kershaw, A. O. Breeds, C. J. Clark, P. J. Byrne, F. E. Masey, J. J. Wood, F. J. Webb, C. S. Meadway, B. Potter, N. J. Stanger, G. G. Wallace, P. H. Watson, C. T. Moxon, E. J. Stow, E. P. Tucker, L. Lunn, J. Shepherdson, W. G. Roberts, G. E. Holman, C. R. H. Tyndall, G. P. K. Young, H. C. Chevalier, R. W. Paul, W. R. Crewe, A. G. Griffith, H. W. Webb, J. M. Hatfield, E. J. Thomson, E. H Dance, W. C. Rea, Y. E. Bigsby, F. D. Hoyland, P. Brown, C. J Knight, H. O. Jackson, P. L. Sweet, T. E. Pryce, H. C. Brookfield, J. M. Keith, W. H. Closson, A. Turner, J. I. Murray, J. C. Waghorn, W. E. Symington, and W. A. Aldertan.

views on the subject of the employment of specialists had been somewhat misunderstood. What he proposed would not materially add to the cost of building. He presumed that an architect having a large building to erect, and finding himself not sufficiently conversant with some particular subjects, would find it advantageous to consult some other gentleman who, while being an architect in general practice, was known to have given attention to some one particular branch of his profession. To take the subject of drainage, for instance. Within the last year Mr. E. C. Robins and Mr. Ernest Turner had read admirable papers on the subject of house sanitation, to which subject it was known they had given special attention. Suppose, on a matter connected with warming, ventilation, or drainage, an architect wanted information which it was no doubt in the power of one or the other of those gentlemen to give, why should he not consult them, paying them a fee of a guinea or two for their advice, just in the same way as medical and surgical practitioners consulted physicians and surgeons of larger experience than themselves? If such a course were to be generally pursued, it would prevent a great deal of the architect's own proper work drifting out of the profession into other hands. With regard to other subjects, such, for instance, as colour decoration, architects known to excel in that subject might be consulted in the same way, instead of going to Mr. So-and-so, the painter and decorator. Where more than mere advice on any particular part of the work was needed, some system of sharing the commission on the cost of the work could surely be arranged between the parties. When he spoke of specialists, he did not mean those specialists who were tradesmen, for of course they would recommend nothing but their own appliances, materials, and schemes. As to perspectives in competitions, there could, of course, be no objection to them if they were honestly made, as suggested by Mr. Vacher, from one point of sight. With regard to iron-girder work, it was a common thing for an architect to go to an engineer for advice, and he thought that the architect was wise in so doing, although the idea was entertained by some people that it was a dreadful thing that an architect should not be a thorough master of constructive iron-work. Surely, seeing that the subject was one which took almost a lifetime to thoroughly master, the architect, who had to give his mind to so many matters, might be excused if he called in competent professional advice rather than risk the safety of his building? As to Mr. Smith's observations about the powers required in planning and design, he thought it was the late Professor Cockerell who advised that, at any rate in every important building, two architects should be employed, one to make the plan, and the other to design the elevation. Unfortunately, many young architects were apt to think lightly of planning, but, rightly considered, the plan was the *alpha* and *omega* of all good art in building.

The meeting then terminated.

ENGINEERING WORKS PROJECTED AND IN PROGRESS.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THE inaugural address was delivered by the president, Mr. A. T. Walmisley, on the 8th inst. First sketching the history and progress of the Society, the writer treated of the position and duties of the profession, passing thence to a notice of works now in progress. We print the latter half of the paper:—

It is now about fifty years since electricity may be said to have become just ripe for adaptation to practical purposes, and was much developed by the experiments of Faraday and Wheatstone. In 1838, the first telegraph line from Paddington to West Drayton on the Great Western Railway was set up, and so universal is its present application that even the interior of the great continent of Australia is now crossed by the electric telegraph. Among various applications of electricity to motive power may be mentioned the propulsion of trains by currents passing through the rails. The recent Paris Electrical Exhibition demonstrated the progress made in all branches of electricity, and particularly in its application to railway work. A curious experiment in engineering will be the execution of the proposed plan of Mr. Maxim, of New York, for the drainage by electricity of the basin around the city of Mexico, to do which a company has been formed, the funds raised, and the contracts signed. The plan in brief is to establish on the western slope of the mountains, where the fall is great and rapid, a number of water-wheels sufficient to develop some 20,000 horse-power, and make them drive dynamo-electric machines of high electro-motive power. The current from these machines is to be conducted about twenty miles to a set of electric motors placed on the margin of the lake, and driving pumps which will require about 7,000 horse-power to work them. The water has to be raised about 40 ft. to clear the ridge, but once raised it has an uninterrupted fall toward the Pacific of several thousand feet, so that the descending water is made to keep up the work. The whole apparatus constitutes what Mr. Maxim calls an "electric syphon." The plan will (says the New York *Iron Age*), it is believed, succeed, and thus relieve Mexico from the inundations that have damaged it so much for several centuries.

The Naval and Submarine Engineering Exhibition, to be held next April at the Agricultural Hall, is being well supported, and will doubtless be productive of much good. The exhibits will consist of machinery and mechanical contrivances employed in or connected with the construction and equipment of ships, docks, harbours, forts, and the like, and the value of the exhibition will be increased by lectures on naval architecture which will be given. In the designing, construction, equipment, and working of our fleets the foremost talent is engaged, and upon it the highest mechanical skill is employed, and the prizes to be offered will doubtless act as an incentive to many inventors to make known their ideas. The great progress made of late years in marine engineering is due to the continual competition between rival lines, thus necessitating economy of working by developing the largest amount of power out of the smallest quantity of fuel, so as to leave more room for cargo. Great Britain has now over half the sea-carrying trade of the world, and the great increase of length in modern vessels necessitates in many cases either the enlargement of old, or the construction of new, docks. This great enlargement of our dock accommodation is a feature of no small importance as regards the industrial progress of England,—at Leith, at Liverpool, at Folkestone, at Swansea, at Cardiff, at Milford, at Hull, and Penzance, in addition to other places on the coast. London herself has now special plans under consideration. The construction of the Victoria Docks provides an entrance lower down stream, where the navigation is less impeded. New docks are also in contemplation at Dagenham and Tilbury, with the object of avoiding the navigation of the somewhat circuitous reaches above Gravesend. The Act of Parliament for the Dagenham Dock was obtained last session, Messrs. Bell & Miller being the joint engineers, and Mr. James Abernethy, President Inst. C.E., the consulting engineer. The Tilbury Dock scheme is promoted by the East and West India Dock Company, and though not much more than one-third that of the docks at Dagenham in water area, it will, when carried out, possess the great advantage of a very large quay area and quay wall length. Plans have been deposited to accompany a Bill for next session, under the direction of Mr. Manning, the company's engineer, and Mr. Ahlfeldt, the manager of the Millwall Extension and East and West India Dock Company's railways. The site selected is at the natural entry of the Port of London, on the west side of Tilbury Station, opposite Gravesend, and the scheme is designed to meet and accommodate to the fullest extent the large steamships engaged in the East India, China, Colonial, and American trades, and will be capable of docking the biggest vessel afloat, except the Great Eastern. It will be essentially a railway dock, having lines running along the jetties connected with the Tilbury system, and laid with easy curves, and without turntables, so as to expedite the rapid handling of the immense railway traffic, which must necessarily pass over the Tilbury line into these docks. The junctions at Barking, Bromley, and Bow place the whole of the Tilbury Railway system in connexion with the great trunk lines of the kingdom, and the dock traffic will thus be enabled to pass by less conjested routes than those serving other dock undertakings. Ample shed roofing will be provided, a large quantity of grain and food stuffs having to be dealt with, which has now become such a prominent feature it the importations of this country, and the East and West India Dock Company will be enabled to maintain their supremacy in the chief port of the United Kingdom. It is proposed to construct two graving docks of about 900 ft. in length, with a sill 27 ft. below high-water mark, thus ensuring the reception at any time into dry dock of the largest American vessels. The *City of Rome* is 535 ft. long, 52 ft. beam, and 26 ft. draught, and is the largest vessel afloat, except the *Great Eastern*. The *Orient* is 470 ft. long, 46 ft. beam, and draws 26 ft. 6 in. when very heavily laden. The new deep-water docks at Tilbury will thus be seen to be capable of docking any vessel that can pass into New York, where the draught is limited to 26 ft. The new graving-docks will be capable of sub division by caissons sliding in grooves, so as to dock two or more vessels in separate compartments as may be required. The quay berthing accommodation will be over 15,000 ft. in length, with a uniform depth of 35 ft. of water throughout, and thus there will be no necessity to remove a vessel of the greatest capacity and draught for the completion of her loading, to the outer or tidal basin, the sixteen acres of which, with a depth of 41 ft. at high-water spring tides and 26 ft. at the lowest time of the tide, will be exclusively available for the direct entrance or departure, at any moment, of the largest class of ocean-going vessels now in existence or likely to be constructed, after the experience of the *Great Eastern*. The Port of London will thus cease entirely to be on the same footing as the other great commercial ports round the coast, the approaches to many of which are by tidal rivers, having shallow bars or with insufficient depth of water in their navigable channels at low tide, to admit of the reception and departure of vessels of the type enumerated, except at or about the time of high-water. Much has been done of late years in floating docks. Hydraulic docks, with floating pontoons exist at Bombay, Malta, and the Victoria Docks, London, and a new dock on Messrs. Clark & Standfield's system, is now being constructed at Barrow for the Furness Railway Company, which will be entirely a floating dock capable of accommodating vessels of nearly 3,200 tons displacement, not only raising them out of the water, but placing them, if desired, on fixed staging erected along the shore. One peculiarity in the construction is that the dock can be divided equally into two parts, each provided with its own engine, pumps, &c., so that each half can be used as a separate independent dock for smaller vessels, and can also be employed to raise the other half, so that every part of the dock is accessible for painting and cleaning.

Competition between railway companies is good, and preserves the public against limited accommodation, high rates, and imperfect service. Our leading companies have recently seen the advantage of separating the goods traffic lines from the passenger traffic line as much as possible. The widening of the London and North-Western Railway system at Liverpool is about to be followed at Birmingham, where it is proposed to throw the approach tunnel leading into New-street Station into open cutting, and to construct four lines of rails instead of two. The Great Northern Railway are about to widen their line between Hornsey and Potter's Bar, and similar widenings and extensions are going on in various parts of the country. Though all the main lines of the kingdom may be said to be constructed, a great deal remains to be done in the way of loop-lines and junctions, so as to effect a better connexion between our existing systems; for instance, to quote a case near home, all the goods traffic between the North-Western Railway and the South-Eastern Railway has, for want of direct railway communication, to be carted across London in wagons.

As regards metropolitan Parliamentary work there are more independent schemes proposed for next session than have been brought forward in any single session since the great railway years. There are 131 plans deposited for railways, twenty-seven plans for tramways, and eighty-three miscellaneous schemes, in addition to sixty-nine plans in connexion with Provisional Orders. The 14th of January will, however, test a great many, when, according to the Standing Orders, the usual five per cent. upon the amount of the estimate has to be deposited in the Court of Chancery. Among the schemes submitted are two Bills to improve the communication by railway to Waterloo Station. An Electric Railway is proposed to be made by a

new company leading from the north-west end of Northumberland Avenue, and running to within 9 yards of the arch of the loop-line of the South-Western Railway in Vine-street, York-road. Another scheme proposes to connect Waterloo Station with the City by a railway terminating near the Mansion House Station, on the west side of Queen-street, in Cannon-street. On the Surrey side, the connexion with the South-Western Railway is proposed to be formed by lines leading direct out of the station, and also by a curved loop-line entirely outside to enable trains to run through without entering either of Waterloo Stations. The London and South-Western Railway Company ought long ago to have run on to Charing-cross and Cannon-street rather than allow the South-Eastern Railway Company to have made this branch. A useful junction is made between the London, Chatham, and Dover Railway and the South-Eastern Railway on the north-east side of the latter line, enabling trains to run on from the north of London and Holloway to Woolwich, and a similar curve might easily be constructed on the south-west side, forming a junction between the South-Eastern and London, Chatham, and Dover Railway lines, which would enable the London, Chatham, and Dover Railway passengers to run on to Charing-cross. The plans connected with the proposed Metropolitan Outer Circle Railway as deposited, show various junctions by means of which it is contemplated to connect Ealing and other places in Middlesex, with Barking and other places in Essex, by a north-east route, running powers over the necessary existing lines being sought for. Another scheme, bearing the title of the Mid-Metropolitan Railway, proposes to form a railway to be worked on the pneumatic principle, commencing by a junction with the West London Junction Railway at Hammersmith, and running to near the Minories at Whitechapel; also another pneumatic line from the Exhibition-road to Park-lane, and another from Clarendon-place, Uxbridge-road, to Bridge-street, Westminster. Plans are also deposited for a railway in connexion with the Channel Tunnel, which is making fair progress. This Channel tunnel is not yet taken up by the Government officially, but the Board of Trade will, no doubt, watch the proceedings; for, as forming a link between the two realms, the proprietary rights of the constructors should be clearly limited. It is, however, only fair to the shareholder that the legal aspect of the question should be definitely settled, in order that their interest may not suffer with the realisation of the project.

Among various schemes suggested, a central station has been proposed for London; but I doubt very much if it would answer as such. The Post-office find that district offices can be better worked than one large central office; and if this is so in the case of letters, it certainly will be so in the case of people.

Railways have hitherto been the means of employing a larger number of civil engineers than any other branch of the profession. The population of our large towns and cities is increasing daily and a large field lies open in connexion with drainage and water supply. Where sufficient land can be obtained sewage irrigation is undoubtedly the very best way of dealing with it, but it needs to be managed in a proper manner, the object being utilisation and not mere convenient disposal. Where land cannot be obtained suitable, the aid of chemistry may be called in, but it is best to avoid chemical means as much as possible on account of the annual expenditure needed to maintain the works in good order. Pure air and unpolluted water are indispensable essentials to health and happiness: hence the importance of strict attention to sanitary matters cannot be over-estimated.

Time will not permit me to do more than allude to the proposed new Tay Bridge and the Forth Bridge. The Tay Bridge will be built about 60 ft. west of the old bridge and will be nearly two miles long. The spans will be 85 in number, and the level of the under members of the girders, 11 ft. lower than in the late Sir Thomas Bouch's work. The future Forth Bridge is to be a continuous girder bridge of varying depth. There are to be two spans of 1,700 ft. and two spans of 600 ft.; the depth of the proposed girder will be 330 ft. over the piers and 55 ft. in the centre. The bridge is designed to take a rolling load of 1,700 tons on each line as compared with 600 tons in Sir Thomas Bouch's design. Bouch's bridge was calculated to sustain 10 lb. per square foot wind pressure; in the new design no part of the bridge would be blown over or any member permanently injured with a wind pressure of 112 lb. We shall probably have an opportunity to allude to these structures further in our discussions during the session.

In conclusion, let me address to our new members a few words on the use of note-making for the preparation of a paper. The value of note-making can scarcely be exaggerated, but it is necessary to bestow great care upon each fact collected in its individuality of source and bearing, otherwise the caustic criticism of Dr. Johnson will be applicable that "they were neither meat, drink, nor good talk." Observe and record, but remember that to be useful an engineer's note-book must be clear, concise, and well-illustrated with sketches of details. A good index is also indispensable. Much as Molesworth's "Pocket-book of Engineering Formulæ" is used, it is very difficult to find what one wants from the Index. I, for one, attach great importance to note-making, and consider a note-book and pencil as essential to carry in the pocket as a 2-ft. rule. In writing a paper or a report upon any subject, it is impossible to do it justice without some precedent or allusion to similar cases, and this is furnished by the note-book. It has been well said that "great effects are produced, not by the effort of the moment, but by the preparation of past moments," and what I am now simply urging upon those members who have not already tried the experiment is preparation by the collection of material, which, judiciously made, is certain to prove useful in a professional career.

It is not easy to give a written description of any engineering work. One may readily write down thoughts as they occur, but the difficulty is to arrange them together for the illustration of a principle. I have known many men able to execute work efficiently who could describe their plan most intelligibly in ordinary conversation, and yet who would utterly fail in writing a paper or addressing a meeting. Notwithstanding this, I am of opinion that those who write as well as read upon any subject are those who acquire the most perfect knowledge of any art or science, and the very best way to find out our own deficiencies is to write about the subject. A paper to give rise to a good discussion must be no mere collection of separate disjointed thoughts, like the recipes in a cookery-book. It must be no perfunctory composition, but display consideration, thought, and be practically suggestive. It should not attempt to exhaust the subject of its title, but simply to introduce it, supplying, as it were, the right key-notes for discussion, and leaving the variations to be taken up by the meeting. Considering that we award no premiums, as in other societies, our list of papers is certainly a matter of congratulation:—

Railway Working and Management, H. Mitchell Whitley, A.M.I.C.E.; Differential Tides, James Love, F.R.A.S., F.G.S.; Foundations, William C. Street, A.R.I.B.A.; Practical Ironwork, R. E. Middleton, A.M.I.C.E.; Water Fittings, M. A. Pollard Urquhart; The Air within our Dwellings, Professor Kerr, F.R.I.B.A.; A Visit to the Birmingham Sewage Works, Thomas Cole, A.M.I.C.E.; Statistics of Railway Travelling and Tonnage in 1880, B. Haughton; The Necessity for increasing the Dimensions of our Docks, R. Nelson Boyd; The Berlin Metropolitan Railway, William Bird.

NORTHERN IRON TRADE IN 1881.

The facts are now obtainable from which there may be formed an idea of the value and the volume of the Northern iron trade during 1881. Not the least interesting of these facts are those that point to the value of the product,—to the prices that have been obtained for it is in a very great degree to this that the extent of production is due. In the crude iron trade of the Cleveland district, the official facts show that a declension in price continued throughout the first three-quarters of the year. The realised price for the first quarter was 2*l.* 0*s.* 2*d.* per ton, that for the second quarter 1*l.* 18*s.* 2*d.* per ton, that for the third quarter 1*l.* 16*s.* 9*d.*, and though that for the last quarter will not be declared for some time, it is probable that it will show an increase in the price on the whole. Generally speaking, the prices of iron of other kinds has varied in a somewhat similar way throughout the year, and this indicates, in great degree, the position that the trade, as a whole, has been in throughout the year. In the first seven or eight months the market was falling, and orders were in consequence kept back as long as possible, with a consequential decrease in the prices of iron, and an increase in the stocks in the hands of the makers. In the last quarter of the year, the attitude of the makers, and the reduction in the output of Cleveland iron, changed the position, and with the probability of a decrease in stocks that has been since demonstrated true, the market felt an impetus, and prices rose with rapidity to the point that the year commenced with. And in the last month, when the operation of the restriction of the output and the fuller demand were felt, stocks showed so marked a declension that the price again rose, and it is probable that at the close of the year it will be above that of the beginning.

Prominent in the features of the year has been the collapse of the demand for crude iron for the United States. Last year there was the pouring in from the North of England of large quantities to America; this year there has been little or none sent there direct from the Cleveland district. But in the meantime there has been a clearance of the stocks of imported iron that had accumulated at the ports of importation west of the Atlantic, and prices of Cleveland iron having risen there, it is probable that there will be a not inconsiderable export of crude iron thence in the course of a few months. There has, however, to the district been a counterbalance in another part of the American demand,—that for steel rails. The demand for steel for the United States in the shape of blooms and of rails has been so great that the local consumption of crude iron in the manufacture has been far above that of the quantity sent last year as pig-iron. Hence the demand from the United States has done much to steady the trade as a whole, and has given much of a demand that has kept up the output at the highest rate, and given a large increase over that of the past year. In 1880 there were produced over 2,500,000 tons of pig-iron of all kinds in the Cleveland district; in 1881 it is certain that the production will in the total be over 2,600,000 tons. But the increase is almost entirely in the production of iron for use in the steel manufacture,—iron, that is, mainly produced from ores imported from Spain, Carthagena, &c. The largeness of the production of this class of iron in the Cleveland and Durham district is one of the features of the age, as showing that in that great district, surrounded by its own ores, it has been needful to turn furnaces to the production of over 600,000 tons of iron from ores brought long distances. This, and that restriction of the production of pig-iron that has been so much condemned on economical grounds, but which seems to have been successful in its operation,—these have been the chief features that have marked the history of the Cleveland iron trade in its first producing branch.

In the manufactured iron trade the fluctuation in prices has been less, whilst the production has been very considerably enlarged. This branch of the trade has now fully overcome the effects of the decay in the iron rail manufacture. It has substituted for it the production of shipbuilding iron, and this to an extent that the total production of finished iron in the north of England is now nearly equal to what it was when the trade was at its briskest and had the rail-trade in addition to the branches that survive. It is to the growth of the demand for shipbuilding iron that the improvement is due, and the fact that briskness rules in the shipyards, and that freights are tolerably good, leads to the belief that the activity will continue for some time, and that the iron trade, as a whole, will feel the prolongation of the benefit that it has felt for the past year. That demand has enabled the plate-makers to maintain prices that are on the whole profitable, and has one by one brought nearly all the finishing ironworks of the north into operation after a continued period of dulness. The local demand for shipbuilding iron has, indeed, been one of the chief supports of the iron trade, for it is believed that the plate and angle mills in Durham and on its borders will have this year consumed the bulk of 800,000 tons of pig-iron; so that, except the shipments to other districts, they have been the largest users of the Cleveland pig-iron. The year, then, has seen the iron trade of the North placed on a firmer foundation; prices that, at the middle of the year, owing to the heavy stocks, were only occasionally remunerative, are now generally

profitable. The production, if not at its highest point, is very large, and the present demand is shown by declension in the stocks in the hands of the makers to be above it, so that the trade will enter the new year with brighter and brightening prospects, that must, as the facilities of production are increasingly used, be reflected on the prices, and, by the operation of the sliding scales, on the wages of the workmen; and by means of an increased circulation of money, must contribute to the general trade improvement.

THE AMSTERDAM ARCHITECTS.

THE Netherlands Society for the Promotion of Architectural Art, which has its head-quarters at Amsterdam, has invited an international competition for plans for a new architects' club-house. The conditions prescribe that ground-plans shall be in the proportion of 1 to 200; sections and views, 1 to 100; and external and internal details, 1 to 10. The prizes are the gold, silver, and bronze medals of the Society, together with premiums of 42*l.* 10s., 25*l.* 10s., and 8*l.* 10s. respectively. The jury is to consist of three foreign and four Dutch architects. The date for sending in the plans expires on May 1st, 1882. M. C. F. J. L. Rieber, the secretary, 2, Wyde Kapelsteeg, Amsterdam, will supply applicants with the programme of the competition.

PROPOSED REVISION OF METROPOLITAN BUILDINGS ACT.

SIR,—I am induced to trouble you with another letter, as a suggestion is made in your pages to alter the existing provision as to the capacity of buildings by enlarging the cubic area allowed by the present Act. I am inclined to question the wisdom of this suggestion, as the objection to the present limit could be better overcome without increasing the risk.

What I recommend is to legalise horizontal party structures of a specified construction, such as concrete and iron, the iron in all cases being either embedded wholly in the concrete or encased in terra-cotta or other fire-resisting material. Each floor or space so enclosed to be allowed to contain the present stipulated area, and all communications between such areas as staircases, lifts, &c., to be enclosed by cavity and continuous walls, with double iron doors to the apertures of communication, the whole of the construction being of fireproof material. This, I contend, would meet all the requirements, and, while allowing larger spaces under one roof without lateral divisions, which constitute the chief objection to the present law, would not extend the area exposed to danger from fire. The security from spread of fire in such construction was recently fully demonstrated in the case of the Haymarket Stores. I had a case in my own experience some time ago, in which the subdivision vertically by two party walls was very undesirable. I therefore formed the whole basement (being below the street-level) of vaults, with brick arches, enclosing the stone staircase to the ground-floor with brick walls, with double iron doors to the basement, thus reducing the area above, so as to require only one vertical party wall. This, after the building was erected, was objected to by the district surveyor as illegal; but the magistrate, being appealed to, decided in my favour, on the plea raised that vaults were excluded from the computation of area, and the matter was not carried further.

Here, again, another anomaly exists in the present Act, for flats or separate dwellings can be constructed as I suggest, only they must be separately approached by an open fireproof staircase from the street, and I fail to see any more security in such a separate outward approach than in a fireproof enclosed one such as I suggest. The revision of the Act as I suggest would, I contend, meet all objections without the risk of extending the ravages of fire, as would be the case were the present allowed area to be increased.

While writing, there is a point under the Metropolitan Management Act to which I should also like to call attention, viz., the control of the Metropolitan Board of Works over projections from the line of house-fronts in existing thoroughfares. This should be restricted within certain defined limits, say, within 10 ft. or 15 ft. of the footway; for it appears to me to be a great hardship and an unnecessary interference with the rights of owners to exercise any restriction beyond some such limit.

We will take a case where the houses were originally set back 50 ft. or so from the roadway, the gardens being formed in front of the houses. The thoroughfare having become urban, vegetation does not thrive, and the character of the houses has changed. The original leases expire, and it is necessary to rebuild the houses as the leases fall in. Is it just? It certainly is not consistent to say, "As you have once set up a frontage line, and cannot vary it, however the circumstances may differ, even if the adjoining owners raise no objection, you must perpetuate as an eyesore that which was originally intended for an ornament, as a garden." The width of new streets is prescribed, and if the old street is of the proper width fixed for a new street, 10 ft. more on either side, given to the public, is surely a sufficient concession, and would barely meet the justice of the case, in my opinion.

THOMAS HARRIS.

COMPETITIONS.

The Proposed Statuary for Blackfriars Bridge. At the meeting of the Court of Common Council on the 15th inst., the Bridge House Estates Committee presented a report on the reference of July 1st, 1880, instructing them to obtain, by public competition, designs, which shall be the absolute property of the Corporation, at an expense, by the way of premiums, of a sum not exceeding 1,000*l.*, it being desirable that Blackfriars Bridge be completed in accordance with the designs and provisions of the engineer, by the addition of appropriate groups of statuary to be placed upon the pedestals provided for that purpose at the extremities of the bridge. The committee having advertised, forty-nine designs were sent in, and referred to Sir Frederick Leighton (President of the Royal Academy), Mr. W. C. Marshall, R.A., Mr. G. F. Watts, R.A., and the City Architect, to make a selection therefrom, and they had laid laid before them a letter from Sir Frederick Leighton to Mr. Comptroller, which they submitted for the consideration of the Court.

The letter stated that the committee of award had inspected the models on two separate occasions, and had selected the six in which in varying degrees appropriateness and talent were best combined. But they were not prepared, in view of the great importance of the work, and the high gifts required for its adequate and satisfactory performance, and in view also of the calamitous results of failure, to recommend the execution on a large scale of any of the designs submitted to them, or the employment of the competing artists in the preparation of other designs with a view to their execution. But whilst they had with unfeigned regret arrived at this conclusion, they unanimously pressed on the Bridge House Committee the importance of not yielding to discouragement at the failure of a competition in which so much of the best ability of the country took no part, and of seeking now through some other channel to achieve, or at least to partially accomplish, the great object for the fulfilment of which the competition was instituted. The committee recommended that premiums of from 100*l.* to 250*l.* be given for the six best designs, the designs to become the property of the Corporation, and that it be referred back for the committee to consider the best means of carrying out the order of the Court relative to the placing of statuary on Blackfriars Bridge.

Mr. Bedford moved the adoption of the report, which was agreed to.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,276. J. Teer, Salford. Fire-grates. Dec. 2, 1881.

5,279. T. Ivory, Edinburgh. Gas-cooking stoves. Dec. 2, 1881.

5,294. E. Kaulbach, London. Smoke-consuming furnaces, &c. Dec. 3, 1881.

5,299. H. Green, Preston. Removing obstructions occasioned by frost, and preventing freezing in cisterns, &c. Dec. 3, 1881.

5,315. W. Clark, London. Fixing window glass. (Com. by T. Tanner, Otago, U. S. A.) Dec. 5, 1881.

5,319. S. Sturm, Cologne. Increasing the heating-power of stoves and fireplaces. Dec. 5, 1881.

5,324. W. Saunders, Stepney. Implement and receiver for cleansing floors, &c. Dec. 6, 1881.

5,351. T. Rowan, London. Warming and ventilating, &c. Dec. 7, 1881.

5,371. J. Bissett, Glasgow. Apparatus for heating currents of air. Dec. 8, 1881.

5,377. D. G. Cameron, Lambeth. Water-closets. Dec. 8, 1881.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

Dec. 6, 1881.

4,731. J. H. Johnson, London. Compositions to render stone, wood, &c., impervious to air, water, &c. (Com. by G. O. Kramer & Co., Osnabrück, Prussia.) Oct. 28, 1881.

4,941. W. Cunningham, Dundee. Ventilating apparatus. Nov. 11, 1881.

Dec. 9, 1881.

3,416. J. C. Vanlohe, Providence, U.S.A. Sawing or cutting stone, &c. (Com. by P. Gay, Paris.) Aug. 6, 1881.

3,796. A. M. Clark, London. Lenses for use in pavement lights, &c. (Com. by P. Collamore, Boston, and N. Boyle, Springfield, U.S.A.) Aug. 31, 1881.

3,828. M. Merichenski, Poplar. Apparatus for raising and lowering gaseliers, &c. Sept. 2, 1881.

5,027. E. R. Hollands, Newington. Open stoves or firegrates, Nov. 16, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending December 10, 1881.*

1,812. A. E. Carey, Newhaven, and E. Latham, Birkenhead. Manufacture of concrete.

In order to mix the several materials of which concrete is composed thoroughly, they are placed in different hoppers which deliver the required quantities on to a mixing-pan. This pan is stationary, or capable of being rotated, and is fitted with movable or stationary mixing-arms. When the materials are thoroughly mixed in the pan they are delivered in a dry state to rotating-inclined cylinders, where they are damped with water, and again mixed, and from whence they are delivered ready for use. April 27, 1881. Price 8d.

1,900. T. Jackson, Edinburgh. Utilising waste heat of kitchen ranges, &c.

Shafts are made to enclose the water-pipes, cisterns, &c., the air in which is heated by the kitchen range, as all danger from frost is prevented. May 3, 1881. Price 9d.

1,903. M. Ingram, Manchester. Fireplaces for dwelling-houses.

The fireplace has bars in front, but a solid bottom. The products of combustion pass through an opening at the back of the fire downwards to the underside of the bottom. A door is provided to this space, in which is a grid, through which a small quantity of air can be admitted to consume the smoke. The gases then pass backwards again to a vertical flue leading to the chimney. Air chambers can be fitted at the sides of the grate for heating the air of the room. May 3, 1881. Price 6d.

1,927. H. Hill, Macclesfield. Manufacture of paving flags and tiles.

At the bottom of a mould, fragments of hard stone with their faces outwards are arranged, and a "grouting" of Portland cement is poured in. The backing may be composed of gravel and an inferior quality of cement. The flag is allowed to set, and then removed from the mould. May 4, 1881. Price 4d.

1,966. W. Jones, Manchester. Water-meters, &c.

A cylinder has two pistons connected by a rod. Between them is a lever, one end of which is moved by the pistons as they traverse to and fro in the cylinder, while the other end actuates a slide valve by which water is admitted to and withdrawn from the cylinder. The lever has a registering dial. (*Pro. Pro.*) May 5, 1881. Price 2d.

1,976. J. Carrick, Glasgow. Stoves and fireplaces.

Within a chamber of metal and glass is a basket containing the fire. The flue with a bell-mouthed opening is placed above the fire. The basket can be placed in any part of the chamber and the flue be made telescopic. May 6, 1881. Price 6d.

2,010. H. J. Haddan, Westminster. Warming apparatus.

An air supply-pipe passes from the hearth to the chimney, and is provided with a valve. The openings of the stove and of the chimney which communicate with the room may, therefore, be closed. (Com by A. H. Godefroy, Versailles.) May 9, 1881. Price 2d.

3,707. W. R. Lake, London. Water-closet apparatus.

The pan is made of glass, blown in a mould, and inclosed in a metal jacket. The outlet is shaped so as to form a trap, and at the end of the outlet is a flap-valve. A valve is also fitted to the commencement of the outlet, which is raised by hand. The water is admitted to the basin automatically by a float, which, when the water falls below a certain level, opens a valve and admits more. (Com. by the Hartford Sanitary Plumbing Company, Hartford, U.S.A.) August 25, 1881. Price 6d.

Scott Memorial Fund.—A meeting is to be held at the rooms of the Royal Institute of British Architects, No. 9, Conduit-street, on this Friday, December 30th, at two o'clock p.m., to consider the transfer of the balance of the Scott Memorial Fund as an endowment of art teaching at the Royal Architectural Museum.

* Want of space compels us to omit those published in previous week.

HALF-TIMBER HOUSES WITHIN THE METROPOLITAN DISTRICT.

Mr. J. C. Taylor, of Acton, was summoned by the Local Board in respect of a building which he had erected in the High-street in contravention of the by-law.

Mr. Palmer, who appeared for the Local Board, said the building was a staircase consisting chiefly of wood constructed outside a house. According to the by-law, the building should be constructed of brick, stone, or other hard incombustible material.

Mr. Kisch, for the defendant, said externally it was covered with tiles, lime and mortar being inside.

Mr. Palmer, in reply, said there would not have been any objection to the building had it been all tiles. The by-law required the building to be constructed of hard and incombustible materials.

Mr. Kisch pointed out that the same kind of building was erected on the Bedford Park Estate,—a wooden frame with tiles outside.

Mr. Paget thought it was not in compliance with the by-law. It was what was called a lath-and-plaster house, many hundreds of which existed all over the kingdom. Ultimately, Mr. Paget convicted the defendant, but allowed the summons to be adjourned for him to pull down the building.

LEAD POISONING.

Sir,—In so important a matter as lead poisoning, and which your valued paper has lately been noticing, it appears to me very desirable that any information on the matter derived from personal experience would not only be acceptable, but useful. The minds of many persons who possess a nervous temperament are unduly excited over this matter, which really need not excite alarm or anxiety, for it is well known that there was much truth in the crude saying of the ancients, "Nature abhors a vacuum," and "water must dissolve something," and the highly solvent power of water is universally admitted; yet it is equally well known it has in this matter a greater preference or affinity for some bodies than others. Thus water containing lime, magnesia, and earthy carbonates never can, or will, act on metallic bodies, and as the water we use for domestic purposes contains these, little fear need be entertained of any evil arising from its passing through leaden pipes in its transit. Take from the water these earthy salts and bodies, then the water immediately begins to act on the body (be it metal or otherwise) that it comes into contact with. A simple experiment will show the action of water on lead. Take a little solution of acetate lead,—known as Goulard's extract; if this is mixed with the purest of water (distilled water) a clear solution is obtained, showing its perfect solution. If the next in purity (rain-water) be used instead, turbidity is shown, proving a certain separation of the lead; but if ordinary water, as we obtain it from the water companies or from wells be used, then an opacity and milkiness are thrown out, showing perfect separation of the lead, simply arising from the fact that the water of the solution prefers, or has a greater affinity for, the earthy salts, and hence it parts with the lead not being able to hold it in solution. On this principle, then, there need be no fear of lead poisoning whilst we derive the water we use from the sources we do. But as in some parts of the country water is scarce, and the rain-water is caught and stored in leaden-lined tanks, then a certain acting on may be relied on, and the water contained is sure to indicate by the test of sulphurretted hydrogen lead in sufficient quantities to induce slow poisoning.

Sidney R. J. Smith, A.R.I.B.A.

CLERKS OF WORKS.

Sir,—Whether or not the suggestion of a "Clerk of Works" as to the desirability of forming an association such as he describes is ever likely to develop into a reality is a matter which at this early stage it would be premature to offer an opinion, but doubtless it will, as it deserves to do, engage the serious attention of the numerous body of men to whom it is especially addressed.

In nearly every sphere of professional and industrial occupations are to be found associations or clubs whose members at certain times and places meet together for some purpose or other of mutual interest; then surely there is nothing very extraordinary in the idea of an association of "Clerks of Works," who, it must be generally admitted, form an important factor in the building operations of the present day.

I, as one who feels proud to be classed among the number, although for various reasons cannot take any active part in the organisation, am quite prepared to enrol myself as a member when the proper time arrives, feeling certain it is a move in the right direction, and, if carefully worked out and soundly established, cannot fail to be the means of elevating and bringing into notice a class of men who at present, it is feared, are, like policemen, thought but little of until their services are needed.

Having said thus much I beg permission to offer a few remarks bearing upon the letter of an "Old Clerk of Works," wherein he calls upon architects to select their clerks of works from properly trained and qualified men. "Very good." But he would have better explained himself had he described the kind of training he meant. Perhaps it is only my ignorance, but I should have thought that architects are the best judges for themselves of the class of men who are most likely to best suit their purpose; and it is notorious that, as a rule, the men selected have been builders' foremen, having worked their way up to that position from journeymen, the instances being very rare indeed that they are drawn from the office,—for this reason, that such a one would have to submit to be led instead of being able to command.

It would be perfectly gratuitous to assert that clerks of works any more than other men are *perfect*, but it cannot be denied that there are, both in London and the provinces, many noble edifices which have been reared under the careful supervision of clerks of works whose names have been honourably mentioned in these columns, and who were thought by the architects who employed them not unworthy of their trust because they had not been trained as architects nor been born gentlemen.

In conclusion, I beg to suggest that all those clerks of works and builders' foremen who sympathise with this question shall send their names and addresses to you, sir,—stating their willingness to assist by a small subscription to meet the preliminary expenses; that these addresses shall be placed at the disposal of the originator; that he may communicate as he deem fit with the owners with a view to promote at first a private meeting for the purpose of organising a public meeting to be convened at the earliest opportunity after the necessary arrangements are made. With this end in view I place at his service my name and address.

Another Old Clerk of Works.

COURTESY TO CLERKS OF WORKS.

Sir,—Will you kindly allow an old subscriber and reader of the *Builder* for these last thirty years to have a little grumble?

I am an old clerk of works, and have had the honour of superintending the erection of many good works in this old England of ours, both for private individuals and her Majesty's War Department as well, and I have had some little experience with the Admiralty. I mention this to show I am somewhat competent to speak of the matter I wish to grumble about.

I mean as to the plan of advertising for clerks of works. In this matter I think a little needful reform is really necessary.

An advertisement appears in your journal asking for applications for an appointment, say, for a clerk of works to superintend the erection of a mansion; candidates are requested to state age, ability, experience, and to send references and copies of testimonials.

In all cases a number of men (many of whom are really up to their work), reply, and send all the necessary particulars. I am afraid to say how many apply. The usual result is they hear no more of their application. Surely, sir, common courtesy should induce the person who advertises to send a notice to the unsuccessful ones, or at least advertise in the same journal, as at first, saying the appointment was made.

I am induced to make this little growl, from the fact that I completed my last engagement in May of this year, and I have replied to some forty advertisements, and not in one instance have I been favoured with a reply,—this, too, in the face of the fact of my having sent an addressed envelope for a reply (yes or no). We clerks of works are a long-suffering race. It is all very well for architects to say they have no time. My experience of twenty-five years convinces me to the contrary; and the least a gentleman can do who asks a number of men to give their time to make an application for his work is to let them know when he has made his choice. A reform in this direction is much needed.

E. H. Cogswell.

Dangerous Chimney-stacks.—The daily papers have already described the terrible havoc caused by the blowing down, during the gale of Sunday morning last, of a great number of chimney-stacks belonging to houses in the neighbourhood of Pentonville and the New River Head. Heavy stacks of brickwork have fallen through the roofs of houses, and have been carried through two or three floors, destroying the furniture and injuring the inmates. At least one fatality is recorded, and there were many marvellous escapes. The public safety demands that the condition of the lofty chimney-stacks of many old houses should be carefully inspected by competent observers from time to time.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.

Sir,—Your correspondent of December 3rd (a "Clerk of Works"), is quite correct in supposing that there is a Clerks of Works and Builders' Foremen's Association; or, more properly speaking, a Provident Institution of Builders' Foremen and Clerks of Works, which has been established for the last forty years, not only for the advancement of its members, but to render assistance to the aged and afflicted members, widows, and orphans.

The society meet on the first and third Wednesdays in every month at 8.30 p.m. for the transaction of business and to admit members. The advantages of the institution are the mutual intercourse of the members, a valuable library of first-class works in connexion with the building trade, and occasional lectures to members and friends.

A copy of the rules and every information can be obtained on application by letter to the secretary, or by inquiry at the institution on any of their meeting nights, when the members will be pleased to see any person desirous of becoming a member.

It is open to clerks, or any foreman in the building trade who has held the position for over two years, and has not less than twelve men under him, and who can give satisfactory proofs of his ability and respectability.

J. W. H. Bedford,
Corresponding Secretary.

9, *Conduit-street*.

ANTHRACITE.

Sir,—I have no interest in any colliery, stove, or process of combustion, and therefore claim to be held as impartial a witness as your correspondents, Messrs. Smith & Stevens. I have been familiar for many years with Carmarthenshire and Pembrokeshire, where, as they observe, anthracite coals are burnt (although the rich Cannel coal is occasionally burnt in the drawing-room), and as a professional man, who has probably superintended the expenditure of more money in those counties than any other person now alive, I think I may be pardoned for expressing an opinion on the subject of their letter in the *Builder* of December 17th.

That opinion is, that it is extremely undesirable that anything should be said or printed tending to invalidate the force of your warning as to the danger attendant on the unwary consumption of a class of coal that is excellent in all other respects. As to that danger, I hold that there can be no more doubt than as to the similar risk attendant on the use, in France and Italy, of fine wood charcoal, the fatal effects of which, in a close apartment, are but too well known. It may, perhaps, be the case that with a brisk fire and carefully-regulated stove and flues the greater part of the carbonic acid gas formed in burning anthracite can be carried off; but it is extremely difficult to prove that this is, at any time, the case. The specific gravity of carbonic acid gas is rather more than half as much again as that of air, being from 1·51 to 1·52, if air is 1·0. As invisible, tasteless, and devoid of scent, unless when it contains some mixture of sulphur, its presence in an apartment is hard to detect, while only a violent draught can sweep such a heavy body up the chimney, as it naturally sinks to the floor. Now the great value of anthracite as fuel is the slow, steady combustion by which it maintains a constant heat; so that in theory, as well as in practice, the escape of gas into the room is for the most part steady, and in considerable quantity.

You will, perhaps, permit me to give my own first personal experience of the consumption of anthracite in a dwelling-house. I had occasion, many years ago, to visit Pembroke Dockyard professionally. I had been married little more than a year, and my wife accompanied me. It was before the South Wales Railway had made much progress, and we stopped for a night at Carmarthen. We had a sitting-room in the hotel, opening into a bedroom, and when my wife retired to undress, she left me by a very bright anthracite fire, of which the warmth was very agreeable. Becoming alarmed at my not following her for a long time, she returned to the sitting-room, and found me in a heavy sleep on the sofa. She had much difficulty in arousing me, opening the window, and providing a supply of fresh air. There is but little doubt, I think, that if I had been left undisturbed that sleep would have been my last. I apprehend that any one accustomed to the coal would have been aware of the danger of falling asleep by the side of an anthracite fire.

The fact is that all the safety signals of nature, of which pain is the principal, have in them something disagreeable. Such is the case with the acute pain experienced on any injury to the skin, occasioned from without. Such is the case with the noise of wheels, which we are now so careful to minimise, at the cost, more or less, of public safety. Such is the case with the warning which smoke gives of the presence of fire. And if we contrive, as we readily can do, to dispense with smoke, it becomes necessary to take such precautions in so doing as may prevent the additional danger to life resulting from the suppression of the danger signal. To urge, in opposition to this wise rule, the fallacy that "carbonic acid cannot be produced from anthracite coal without sufficient draught to carry it off," is to incur a responsibility which might very probably be attended by very unpleasant results.

C. E.

The Mortgage Company of England, Limited.—Our advertisement columns give the particulars of this undertaking. The list of directors,—Viscount Sherbrooke being chairman,—shows, beyond cavil, that it will be conducted honourably. It seems to us to have a good career before it.

WORKS IN INDIA.

SIR,—I trust you will give me space to say a few words in justice to myself, as Major Mant's principal assistant during the last seven years, with reference to your report of Mr. Spiers's communication at the meeting of the Royal Institute of British Architects on the 5th inst.

Mr. Spiers says that Major Mant trained Indian talent and employed native draughtsmen to work out his designs, especially ornamental detail.

As a fact, Major Mant did train two men, natives of the carpenter caste, who were excellent draughtsmen, and capable of doing original work; these men, who were brothers, were employed by him up to the middle of 1875, the time I joined him in Calcutta (not 1876, as stated by Mr. Spiers).

I, indeed, took their place in his office, as one of them fell ill, and returned with his brother to Bombay, where he died soon afterwards.

I managed Major Mant's office from 1875 to the time of his death. I had the assistance of the surviving brother on the Baroda and Kolhapur palaces, after we returned to Bombay in 1878, but, other than this, I had no assistance for original work from any native draughtsman.

I may also mention that the Baroda Library and Hospital were designed in 1880, not in 1876, as stated in the report.

I have been instructed by the Kolhapur and Baroda States to complete the working drawings for these palaces.

JOHN FOTHERINGHAM.

VARIORUM.

WE mentioned recently the importance to owners of house property and others of clauses contained in the "Conveyancing and Law of Property Act, 1881." A "Synopsis of this Act, with Index and Forms," by Mr. J. W. Dawson, Solicitor, has now been published by Fry & Son.—Of the pile of Almanacks, Diaries, Christmas Numbers, Shilling Annuals, and such like, now before us, what are we to say? All are good and useful to a certain class. The "City Diary, 1882" (Collingridge), "Blackwood's Shilling Scribbling Diary," "The Railway Diary and Officials' Directory" (McCorquodale), and others, tell their own tale, and will be selected according to circumstances. The latter includes a list of the directors and officers of the independent lines of railway in the United Kingdom; the weekly traffic returns for 1881, with blank columns for 1882; and an abstract of four half-years' accounts of some of the principal companies.—Waterlow & Layton's "Surveyors', Architects', and Auctioneers' Diary and Almanac" cannot be too highly praised. The best version, which is, of course, a little dearer than some other diaries, gives a whole page for each day, is strongly bound, and contains a very large amount of information for the professions to which it is addressed. We can praise it honestly.—The Art-Union of London issues, as usual, its unique little Almanac, which is obtainable by all subscribers.—The Gog and Magog of all books of this kind, however, are the "British Almanac and Companion" and "Whitaker's Almanac," the latter again increased in size and value. If asked "which shall we take?" our clear, distinct, and well-thought-out answer is, "both." The British Almanac contains, as usual, a summary of the architectural progress of the year. —"The Steadfast Aim" is the title of the extra Part of the *Quiver* for Christmas, 1881, and an excellent part it is, full of very good illustrations.—Under the title of "Gas and Electricity as Heating Agents," the important lecture delivered at Glasgow, by Dr. C. W. Siemens, is published by E. Stanford. There's matter in't. —"The Gentleman's Annual. Christmas, 1881" (Chatto & Windus), consists of two stories only, both by ladies apparently, and both above the average.—"Mdlle. Angèle," by Alice Corkran, and "A Double Bond." We have read Miss Corkran's with particular pleasure. It is a story of Normandy life, fresh and natural.—Messrs. Bentley & Son follow suit in the game of 6d. editions of popular works, and the card they play is "The Ingoldsby Legends,"—giving the illustrations by Cruikshank, Leech, and Tenniel.—The New York *Sanitary Engineer* for December 1st contains a valuable article, by Professor Henry Morton, on "Electric Lighting: its Fire Risks and their Remedies." So considerable, it is said, has been the success of this periodical that it is to be hereafter published every week.

Christmas Cards.

Messrs. Eyre & Spottiswoode, of Great New-street, Her Majesty's printers, have sent us a large assortment of Christmas and New Year's cards. Some, of course, are less good than others, but the variety and the grace of many of them are remarkable. Mr. E. Maurice, Mr. Harry Arnold, and Miss Steel are their special artists. Such of our readers as want cards of this sort cannot do better than ask at their stationers' for Eyre & Spottiswoode's.

Miscellanea.

The Edison Electric Light.—A paper was read on Wednesday evening before the Society of Arts, by Mr. W. H. Preece, F.R.S., upon Electric Lighting at the Paris Electrical Exhibition. The lecturer traced the progress of the application of electricity to purposes of illumination from the early machines made by Professor Elias, of Haarlem, in 1842, and by Signor Pacinotti in 1861. The arc-lamps, which were described in detail, and the Lampe Soleil, which held an intermediate position between the arc and incandescent lights, had done good service. The rising favourite, however, was the incandescent light pure and simple. The chief lesson of the Paris Exhibition was that the arc-light was suited only for external illumination, while the incandescent lamps were eminently adapted for internal and for domestic illumination. Referring to devices for measuring the quantity of electricity consumed, he showed Mr. Edison's apparatus, an iron box like a small gas-meter. Inside is a glass cell containing two copper-plates which have been immersed in a solution of sulphate of copper. A definite proportion of the current passing through a house passes also through this cell, depositing itself upon one plate, and the weight of copper so deposited measures the current used. Many unkind things had been said, observed the lecturer, about Mr. Edison and his promises, and perhaps no one had been severer in this respect than himself. It was therefore some gratification for him to be able to announce his belief that Mr. Edison had at last solved the problem that he had set himself to solve. Mr. Johnson (Mr. Edison's representative in this country) explained that Mr. Edison contemplated the manufacture of electricity on a large scale for distribution over a wide area. It could be used without any skilled supervision, and could be applied to any purpose for which power was required, such as working sewing-machines, &c. The cost of the lamps was so slight that his company intended to supply them without any charge beyond that made for the electric current. Sir F. J. Bramwell, in bringing the discussion to a close, said he believed that we were near a practical possibility of applying electricity to the illumination of ordinary households.

Gas in Theatres.—The Lord Chamberlain has sent a circular to all the theatres in London, in which he says:—"The theatre at Vienna, which has now been destroyed, appears to have been fairly well arranged and supplied with many modern appliances for safety, but the explosion of gas on the stage extinguished the lights in the auditory. The consequent darkness added to the panic and confusion which ensued, and doubtless prevented the audience from availing themselves of the means of escape provided for them. The Lord Chamberlain has already called the attention of the managers to the extreme importance of an entirely distinct and separate system of lighting for the stage and auditory. At the annual inspection of the theatres in September last this was specially inquired into, when it appeared that, almost without exception, the houses were supplied with gas from two or more mains, and that a distinct service to the front and stage could be arranged without material difficulty or expense. The Lord Chamberlain is fully prepared to acknowledge the readiness of the managers to carry out any reasonable requirements for the safety and convenience of the public, and he feels convinced that they will agree with him that the experience of these recent calamities makes it imperative that the arrangements above alluded to should be carried out in all theatres with as little delay as possible. The Lord Chamberlain must, therefore, call on them to do so, and requests the manager of the —— Theatre, in acknowledging the receipt of this circular, at his earliest convenience, to state what steps he may propose to take in the matter."

Another Vienna Theatre on Fire.—Vienna has had another fright on Monday. In the southern suburb of Mätzleindorf a private theatre, with only wooden stairs, caught fire, and the stupidity of the officials was within an ace of causing another terrible loss of life.

The Contractor for Truro Cathedral is Mr. Shillitoe, late of the firm of Shillitoe & Morgan, of Doncaster. Mr. Shillitoe commenced active operations on Monday, December 19. The footings are in, and the crypt is well forward.

The Builders' Accident Insurance (Limited).—The Employers' Liability Act has now been in operation some months, and several important cases have been tried in the various courts throughout the country as to the responsibility and liability of employers of labour in case of accidents to their *employés*. Several companies take the risk by insuring employers against it. There is one company,—the Builders' Accident Insurance, Limited,—which differs from the others by being restricted to the building trades and those trades which are allied with it, such as timber merchants, slate merchants, and the many other trades more or less in connexion with building. Another feature in this company is that, as it is established and conducted by members of the trade, for mutual benefit, the profits, after paying losses and expenses, will be divided amongst the policyholders.

Electric Light for Lambeth.—A correspondent writes:—"The Lighting Committee of the Lambeth Vestry have decided to make a preliminary trial of the electric light from Westminster Bridge, along Westminster Bridge-road, Kennington-road, Kennington Park-road, to Kennington-gate, where the Brixton and Clapham roads meet, and have invited tenders accordingly. Since Mr. W. T. Wiseman's motion in the Lambeth Vestry on this subject, Camberwell and other vestries are taking the question up with great spirit. In lead of the proverbial parochial apathy reigning supreme, it is now a race among the parishes as to which shall have the electric light first. Perhaps Mr. Wiseman's startling statement as to a saving of 10,600*l.* a year on the tower system of lighting may have had something to do with the energy now displayed.

Reopening of the Royal Polytechnic Institution.—We observe that this favourite place of entertainment and instruction will be open for the delectation of the public during the forthcoming Christmas holiday. Its closing in September last called forth general expressions of regret. That there is a decided demand for such an institution appears to be the opinion of several ladies and gentlemen of high social position who have the welfare of the masses at heart. The Marchioness of Lothian, Earl Brownlow, and Mr. Samuel Morley, are amongst those who are named as having expressed a desire to contribute largely of their wealth to the re-establishment of the institution. We are informed that the transfer now halts simply for the want of some six or seven thousand pounds.

Banbridge Union.—The Guardians of this Union have had for some time under consideration a report, together with plans and specifications, by Messrs. Munday & Lidstone, of Westminster, for the entire reconstruction of the drainage arrangements at the Banbridge Workhouse. The proposal involved the substitution of the earth-closet or pail system in place of the existing cesspools, and an entirely new set of drains for slop-water. The construction of the new drains is to be postponed until the spring, but it is the intention of the Guardians to abolish the cesspools and construct new closets on the pail system at once.

Royal Italian Opera, Covent Garden.—In view of the strong feeling being at present manifested on all sides relative to the danger of theatres consequent upon the recent catastrophe at Vienna, Mr. Herbert F. Gye has thought that it may be of some service to persons interested in the matter, as well as to the public at large, to know the arrangements at this important theatre, and has, therefore, had a description of them printed. The means adopted (we are not speaking of structural arrangements) appear to be ample, and the circulation of the notice will serve to give confidence to the public.

Subterranean Telegraph Cables in Germany.—The network of underground cables in Germany, which was commenced in 1876, was completed this year. The total cost has been thirty million marks (1,500,000*l.*), and 221 towns, including the principal industrial and military centres of the Empire, are connected by the new system. The entire length of the cables is 5,463 kilomètres (about 3,400 miles), and of the wires 37,372 kilomètres (about 23,000 miles. Seventy river cables have been laid. The entire weight of the cables is stated to be 12,829,408 kilogrammes, or over 12,000 tons.

The New Leadenhall Market was opened by the Lord Mayor on the 15th inst. We shall have more to say about it in a future number. Messrs. Francis & Co., of Gray's Inn-road, are fitting up the whole of the shops in the market with their revolving shutters.

Obituary.—On Sunday, the 18th inst., at Alfred Lodge, East-hill, Wandsworth, died Mr. Alfred James Hiscocks, F.R.I.B.A., in the 76th year of his age. For thirty-seven years he had been District Surveyor of Wandsworth and Tooting. Death has been fearfully busy amongst members of the profession during the last few days.

TENDERS

For portion of work in completion, Granville Lodge, Redbill. Mr. Banister Fletcher, architect:—

King & Sons	£1,690 0 0
H. Burman	1,291 0 0
T. Heath	1,268 0 0
W. & H. Castle	1,209 0 0

For a house at Putney, for Mr. Peter Yapp. Mr. F. W. Hamilton, architect. Quantities by Mr. C. W. Brooks:—

Adamson & Sons	£1,678 0 0
Craske	1,618 0 0
Avias & Co.	1,553 0 0
Pain	1,533 0 0
Aries (accepted)	1,507 0 0

For a villa residence, Melville-road, Falmouth, for Mr. William Hamilton. Mr. F. W. Hamilton, architect:—

A. E. Skinner (accepted)	£945 0 0

For rebuilding two houses in North-street, for Mr. Romain. Mr. C. A. Legg, architect:—

A. S. Judd (accepted).

For temporary chancel, sacristy, side-chapel, gallery, and laying on gas in Catholic Church, Portemouth. Mr. J. S. Hansom, architect:—

Patman & Fotheringham (accepted)	£839 0 0

For additions and alterations to 1, Castelnau Villas, Barnes, for Mr. G. W. Jones. Mr. Frederick Rogers, architect:—

Potterton	£885 0 0
M'Manus	762 0 0
Gibbs & Flew	720 0 0
Jordan	689 0 0
Batstone	680 0 0
Woolf (accepted)	666 0 0

For the erection of the eastern portion of Raikes Memorial Church, Gloucester, including the tower up to the ringing-stage. Mr. Capel N. Tripp, architect. Quantities by Mr. Henry Garrington:—

Henry Lovatt, Wolverhampton	£3,459 0 0
Wall & Hook, Brimscombe	3,285 0 0
William Cullis, Hereford	3,150 0 0
D. C. Jones & Co., Gloucester	2,980 0 0
James Clutterbuck, Gloucester	2,900 0 0
Edward Godwin, Gloucester	2,811 0 0
White & Co., Evesham	2,800 0 0
Alfred King, Gloucester (accepted)	2,744 0 0

For rebuilding No. 46, Warner-street. Mr. Wm. Paice, architect:—

Aylett (accepted).

For certain works at Bedford and Norfolk Lodges. Mr. Wm. Paice, architect:—

W. Downs (accepted).

For the erection of boys' school, Hatfield road, St. Albans. Messrs. J. & S. Flint Clarkson, architects. Quantities prepared by Messrs. Hodgson & Mundy:—

Miskin, St. Albans	£2,264 0 0
Iveson,* Northampton	2,160 0 0

* Revised and accepted at £2,210.

For the erection of a house for the manager at the Market Harborough Gas Works. Mr. John Runson, engineer, and Mr. S. J. Newman, joint architects. Quantities prepared by Messrs. R. L. Curtis & Sons:—

Iveson, Northampton	£526 0 0
Barlow, Market Harborough	494 9 0

For memorial to the late Mr. William Smalley, for the Incorporated Society of Licensed Victuallers. Mr. H. J. Newton, architect:—

Cusworth & Sons	£117 0 0
Farmer & Brindley	98 0 0
Waite	72 0 0
Sansom (accepted)	65 0 0

For house at Kent Hatch, Westerham, exclusive of foundations. Mr. M. Ed. Macartney, architect. Quantities by Messrs. Evans & Deacon:—

Durtnell, Brasted	£5,275 0 0
Punnett & Sons, Tonbridge	5,145 6 1
Maides & Harper, Croydon	4,995 0 0
A. M. Deacon & Co., Norwood	4,698 0 0
Bromwich, Foster, & Co., Rugby	4,666 0 0

For alterations and additions to the North Surrey District schools, Anerley. Mr. A. G. Hennell, architect:—

Burman	£4,497 [illegible] [illegible]
Mowlem & Co.	4,474 0 0
Amer	4,250 0 0
Turtle & Appleton	4,175 0 0
Crossley	4,000 0 0
Kirk & Randall	3,884 0 0
Macey	3,880 0 0
Masters	3,775 0 0
Careless	3,729 0 0
Candler	3,720 0 0
Bowyer	3,672 0 0
Hart (accepted)	3,556 0 0

For the construction of roads and sewers, &c., Bower Building Estate, Bedford. Mr. D. W. Aston, surveyor:—

Taylor & Co., Pimlico	£2 995 0 0
W. Harris, Camberwell	2,792 0 0
J. Pizzey, Hornsey	2,431 3 3
H. Morris & T. Peckham, Islington	2,299 0 0
W. Norris, Lambeth	2,242 0 0
Bottoms Bros, Lavender-hill	2,061 0 0
Wilson & Stoddard, Leyton	1,875 0 0
J. Wood & Son, Leicester (accepted)	1,643 0 0

For two houses, Mann-street, Hastings, for Dr. Allen. Mr. W. H. Murray, architect:—

Stubberfield	£748 0 0
A. Vidler	697 0 0
A. H. White	650 0 0
Peter Phillips	624 0 0

Additions to the South London Brewery.—In reference to the list of tenders for these works, published by us last week, we are requested to state that Messrs. Adamson & Sons' tender was accepted because it was really the lowest, deducting the sum allowed by them for the gravel and sand to be excavated.

TO CORRESPONDENTS.

Thanks to many unknown friends for good wishes received. The unexpected pressure on our pages forces us to omit reference to a pile of communications.—T S (next week).—W. B. B. (next week).—S. H (next week)—M J. C B (shall appear)—A. Z (under consideration) F.S. R L.—Mrs M E H C—M. W.—W. W. L.—R F.—F W H—A S J—H. T.—C P.—J S. H.—A A.—S P D.—W J. N.—H & K.—T. J. S & Co.—G. S.—M. & Co.—W. P.—C & Son.—Mr. W.—M & L—H F G.—W. S.—A A.—W. E. M.—E. P. W.—W. A.—D W. A.—E B.—C C.—J T. P. -T. G.

All statements of facts, lists of tenders, &c must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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Addressed to No. 46, Catherine-street, W.C.

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The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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And Farleigh Down.
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Is the best for use in all exposed positions, being a well-known and tried weather stone.
50,000 feet cube in stock.
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Box, Wilts. [ADVT.

Doulting Freestone and Ham Hill Stone of best quality, in blocks, or prepared ready for fixing. An inspection of the Doulting Quarries is respectfully solicited; and Architects and others are CAUTIONED against inferior stone. Prices, delivered to any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset.—Agent, Mr. E. WILLIAMS, 73, Charlotte-street, Portland-place, W. [ADVT.

Doulting Stone and Ham Hill Stone, of best quality. Prices and Estimates, including delivery to any Station, on application to STAPLE & HANN, Quarrymen, Stoke-sub-Hamdon, Ilminster. Agent, Mr. E. CRICKMAY, Langbourn-chambers, 17, Fenchurch-street, E.C. [ADVT.

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M. STODART & CO.
Office:
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IMPROVED HOT-WATER APPARATUS,
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Barry's Lectures on Architecture.

MR. ALFRED BARRY has edited the republication of the late Professor E. M. Barry's lectures on architecture,* delivered from time to time to the students of the Royal Academy. The lectures are prefaced by a short memoir of the author's professional career, by the Editor, of which we need only say here that it includes the history of the rather curious and much-debated matter of the Law Courts Competition, more fully to be read in our own pages, by the way, than elsewhere, for those who are interested in looking up the subject again. We do not think it, at the present juncture, advisable or suitable to enter afresh into any critical remarks in reference to what was obviously in some way or other a mismanaged affair, in regard to which Barry had much right to consider himself ill-used. The memoranda in regard to his subsequent treatment, *consule* Ayrton, serve to remind one very disagreeably of the great injustice and discourtesy with which Government officials in England do not scruple to treat eminent members of the architectural profession, of which there are unfortunately not a few other instances on record, though none so flagrant as this. It is to be hoped things may be somewhat better now, but at that time it appeared that an eminent architect, long in Government employment, and son of the still more eminent architect of the greatest of our Government buildings, was regarded as a person who had no rights whatever, and whose letters and representations in regard to the injustice with which he was treated did not even call for the courtesy of a reply. There can be only one judgment, in fact, in regard to the relations between the Commissioner of Works' Department and Edward Barry, viz., that the Government officials did not even behave like gentlemen, let alone all consideration of their notions upon architecture and architects.

We pass from the memoir, however, to the lectures themselves, which form a bulky volume of over 400 pages. The editor has exercised a discretion in regard to the arrangement of the lectures, which are not printed in the order of the dates of their delivery, but are arranged in reference to their subjects; being classified under two main groups, a first series embodying the discussion of "general principles," and a second "historical" series, the latter being arranged so that the styles are treated of in the historical order in which they arose. Notes are added giving the actual dates of the lectures: thus we find appended to an early chapter of the volume on "Architecture Governed by Technical Principles," a note to the effect that this was the last lecture delivered by the author. Our first impression was rather against this transposition; but, on consideration, we are disposed to think that the book is made to appear a more complete and readable treatise in this manner, when regarded as a whole.

These lectures, as here published, differ very much in two points from the last volume of reprints of Academy professional lectures which we had before us, those of the late Sir G. G. Scott. The latter were profusely illustrated (not, as we pointed out in reviewing them, without some curious slips in regard to accuracy). The present volume, as a book dealing with architecture, is certainly deficient in illustrations, and all those which are given are reprints of cuts previously published in other works. There may have been circumstances connected with the bringing out of the book which rendered this unavoidable; but the value of the book to those who are not already well acquainted with the phases of architecture of which it treats is certainly much lessened thereby. On the other hand, while Scott's lectures dealt chiefly with the concrete facts of architecture, Barry's in many parts cover a wider range, and are largely taken up with the consideration of architecture as affected by social conditions of life, &c., and some of these questions are treated in a broad and philosophic spirit which is not very often to be found in architectural works.

Lights are thrown on a good many points in relation to the causes of failure of modern architecture, in a plain and common-sense spirit, in the first lecture on "The Variety of Interest in Architecture." That people in general should be made to feel that there is this variety of interest is, according to Professor Barry, one of the most essential conditions of architectural improvement. It is not easy to believe, he suggests, that the great public monuments of antiquity were constructed on the disheartening principle which governs public works now, where the question is not, How shall we get a worthy building? but, How little can it be made to cost? "We cannot fancy the architects of Westminster Abbey compelled to cheapen their design by reducing their mouldings, omitting the diapers and carvings, or leaving out the groined roofs, in order to save expense." Thinking of it in this way, it seems sometimes perfectly extraordinary that our press and Parliament should hold so mean a tone about art, and should be so utterly unconscious of its meanness. "Great nations," says Barry, "sometimes do little things, and their very greatness makes them impervious to criticism. It has been said that no one but a banker could walk down Lombard-street in a bad hat; and in a similar way it is, perhaps, only rich communities that can afford to show with impunity a public indifference to art." This may be only too true, perhaps; but there are other rich communities which do not show the same indifference. That this inertia in regard to art and architecture on the part of the public, and of their official representatives, is one of the very heaviest drags on artistic progress which exist among us, there can be no doubt whatever.

This sentence is one example of Professor Barry's tendency to look at reasons and motives, and not only at facts connected with his subject. He touches well, in the same lecture, on the revival movements of modern times, in a tolerant though not admiring spirit, as perhaps being only examples of carrying too far, for a time, the degree of study and of interest in the architecture of the past, which, when reduced to its right place, may in due time be a powerful factor in the formation of the architecture of the future. He was not blind to the fact that the Mediæval revival was from the outset "much mixed up with questions of religion and ritual"; a fact to which many modern Mediævalists are astonishingly blind.

We cannot, of course, go with the author when, in his second lecture, he by implication apologises for the recently-proposed iron balcony to London Bridge, on the ground that it was only a legitimate way of further utilising an existing structure in the best practical manner known in our own day. The project would have ruined the grand architectural expression of Rennie's bridge, and it is questionable whether it would have practically answered the proposed end. Nor can we concur in the apology which he makes in Lecture III. in regard to machine-made ornament, "that it must be clear to us all that the world will never give up a system, which by cheapening production serves the wants of the many, even at some cost to the artistic cravings of the few." This is an argument which is true enough as to machine-made pins and needles, or any other articles of purely utilitarian object. But cheapening ornament by machinery does *not* "serve the wants of the many," for it only gives the many that which is worthless, and which they had better be taught not to want. Ornament made by machinery can never really be worth much,—can never give the pleasure and interest which arise from design into each part of which the hand and feeling of the designer has gone.

The lecture on "Architecture as an Art of Utility" contains much which students would do well to read, mark, learn, and inwardly digest; among others, in regard to the seeking after intentional irregularity. "Young architects are apt sometimes to act as if it were a triumph of their art to throw down at random parts of a structure and accept the result. Irregularity is supposed of necessity to give picturesqueness, and the external quaintness of

* Lectures on Architecture, delivered at the Royal Academy. By the late Edward M. Barry, R.A. Edited, with Introductory Memoir, by Alfred Barry, D.D. With Portrait and Illustrations. London: John Murray. 1881.

a house is more studied than either the purse or the comfort of its inmates. This, I need hardly say, is a complete inversion of the principle that our art is based upon utility. . . . . Excepting in large structures, I should advise the student to be on his guard against needless irregularities of plan. In an artistic sense he has usually no greatness of dimensions or breadth of effect to throw away, and from the utilitarian point of view irregularity means too often expense and want of comfort, from an excessive surface of internal wall and of complication of roof." The fifth lecture, "Architecture Governed by Technical Principles," while there is nothing in it to which we should take exception, might have been more practically valuable if it had been more detailed and less general in its treatment of the subject.

We fear the same must be said of the chapter on "Architectural Proportion and Ornament," at least of the part of it dealing with "proportion," a matter which is said to be of great importance, but in regard to which we certainly can gather little idea from the lecture as to whether Professor Barry entertained any definite opinions on it. The first question in regard to "proportion" is to decide what we really are to mean when we talk of it; whether we are to mean a rule of relative sizes decided by mathematical or arithmetical laws; whether we are to mean the adoption of arbitrary rules, such as those embodied in Vitruvius, as recognised authorities merely on account of their acceptance by many generations of men; or whether our idea of proportion is merely to be derived from the judgment of the eye in each case. The first question is the most important, because on its acceptance or rejection so much depends in our method of looking at and judging architectural works. We do not derive from the author any certain judgment for or against this theory of mathematical proportion in architecture, or any statement of the arguments by which it may be supported or opposed; we have a general statement that the author is not disposed to accept the *dicta* laid down by some writers (as, for instance, that the best Gothic architects based their buildings on the equilateral triangle), but he gives an example of the fact that some conventional rules have produced good results: "A satisfactory proportion of a room may, for example, be obtained by first deciding the width, then drawing a line from one of the corners, so as to form an isosceles triangle, and making the length of the room equal to this line, being the hypothenuse of such triangle." What this means it is impossible to say. An isosceles triangle is simply a triangle of which two sides are equal; the relation of these two to the third side, and of the two equal angles to the third angle, may be anything we like, so that the definition is obviously incomplete somewhere. In regard to the question between the mere general satisfaction of the eye, which an unlearned spectator may be conscious of, and the satisfaction of the architectural critic who perceives that all the parts and mouldings follow out correctly a proportion which his eye has been accustomed to, and which he has been educated to consider as correct, a distinction is drawn which seems to us rather too decided. The instructed architect, we are told, "knows what should be the relative size of every detail,—what ratio the base should bear to the shaft, the shaft to the capital, and so forth. Any departure from recognised rules is to him a solecism and an offence, it is like a false quantity to a scholar, a *lapsus linguæ* to an educated man. The ordinary and not specially instructed observer sees none of these things. It is nothing to him whether a Grecian Doric column be used with a base, or a Corinthian column without one. The relative proportions of mouldings to each other have no significance for him, nor does he appreciate the differences of style which strike at once the more educated critic." Of course not. But how far are the perceptions of the more educated critic due to habit and acquired knowledge of the rules of a particular style, how far to a sense of innate and essential qualities of proportion? Because that is a very important question indeed. An architect who has been trained in a study of Classic models knows in what proportion (approximately, at least) various parts ought to be, and when he sees them differently proportioned he is struck with an impression of awkwardness in the architecture and want of knowledge in the designer; but we can hardly affirm positively that if he had been habituated to these proportions in the original style they would not have appeared satisfactory to him. Habit is an immense factor in architectural taste, far more so than is generally recognised. Then, appended to this, is the question whether it is an object of architecture to reproduce past styles correctly or not. If it is, of course this question of the correct proportion of the parts becomes of great importance. If it be not, the matter is altered entirely. The author, building on the fact that everybody has an opinion that an object is well proportioned or not, and that average cultivated judgment on the subject is not generally wrong, concludes that there must certainly be a science of proportion; but apparently also concludes (though he does not say so in so many words) that we cannot say what it is. That, however, is equivalent to saying that there is nothing that can be called science in the matter; it is a question of natural perception or "eye," heightened by culture. Nor can we say that the subject of ornament is treated in a way to clear it up very much to the student mind. It is certainly rather a contradiction in terms to be told in the same paragraph that a builder may erect a house which is practically satisfactory but displays no art, and that "the latter is shown in the application of ornament," and then in the next sentence, "not by the mere addition of carving, colour, or whatever may be thought to be ornament, but by giving dignity and beauty to the forms of construction," which is the exact opposite of "the application of ornament." A large proportion of the remarks on ornament enforce, in a suitable manner, views which have now been generally adopted by most people who are competent to form an opinion on the subject. We must question, however, the idea that we owe to the Greek love of sculpture the existence of the pediment as a prominent feature in architecture as a means of displaying sculpture. This would have been quite contrary to Greek architectural logic in general, besides which, we know that the pediment (which grew naturally out of the necessity for closing up the end of a roof) is found in the rock-cut architecture of Asia Minor, in places where no sculpture whatever is attempted.

In the lecture on "The Position of Modern Architects in respect of Architectural Restoration," the common-sense of the matter, as far as it can be urged on the side of restoration, is very well put. "Our churches," says the author, "are not mere tombs of the dead, but places of worship for the living. . . . . If the church of the district be so arranged that reverence in the service be impossible; if the pomps and vanities of earthly grandeur make themselves felt in it; if there be signs of neglect and deadness, all the more conspicuous from the contrast outside its doors, are we seriously to be told that we must not alter all this? And why? Because the gallery which darkens and divides bears the names of some old churchwardens; because the damp and ague-giving pavement exhibits some half-legible inscription; because the great Squire's pew, which symbolises selfishness, and shuts out the poor, has perchance some pleasant mouldings, some cornices of Georgian date, or, better still, some reminiscences of Queen Anne." This is just the common-sense of the matter, and it is satisfactory to find it so plainly and clearly put. "If," as he says elsewhere in the same lecture, "there be anything in architecture that is worthy the attention of earnest men, it cannot be that we are to look only to the past."

The lectures which form the historical portion of the book commence with one on "Early Military Architecture," which, as a phase of architectural work in which a great deal of really picturesque effect was evolved from the provision for the sternest and most exacting practical requirements, is not unsuitably placed at the head of the sketch of Mediæval architecture. The author confesses to having been much indebted in this lecture to Viollet-le-Duc, who had made the subject quite his own. We are then taken through the history of domestic architecture in the twelfth, thirteenth, fourteenth, and fifteenth centuries, and into the various periods of the Renaissance. Nothing new is professed or attempted, but there are some new lights thrown on the meaning and significance of some of the changes in architectural style which are worth attention. A remark is made, we observe, as to the vague and incorrect manner in which the expression "Palladian architecture" is frequently applied to Italian architecture:—"When men say they like or dislike Palladian architecture, they do not generally mean to refer to the architectural forms which Palladio himself actually used, but rather to Italian architecture generally, which has come to be described by a term only applicable in reality to one phase of its development." Much of what is called otherwise "Italian architecture" is, no doubt, entirely free from the peculiar faults of Palladianism (which latter is not without its peculiar excellencies also). The editor does not seem to be aware that since these lectures were delivered the history of the connexion of Bramante with St. Peter's has had much new light thrown on it, and it is a pity that he republishes the plan of the church ascribed elewhere to Bramante, and which, if it was Bramante's at all, must have been only a subsidiary sketch for an idea of the church quite different from and quite inferior to the original idea of the Greek cross of which Bramante was certainly the author. Otherwise the review of the history of the Renaissance, except that it requires, like other parts of the book, more illustration, is a very well-connected and suggestive one, which we cordially recommend to the perusal of our readers. We may conclude by quoting the final paragraph, which closes the volume, and suggests matter for thought:—

"A calm review of the history of the Renaissance, and of the circumstances which led to it, leads us to the conclusion that the movement is not yet over. The Classical tastes, which gave to it the first impulse, still exist among us and are likely to continue. An architecture which can give us solidity and magnificence; which can adapt itself to purposes of utility, and assimilate progressive scientific construction; which unites elegance of proportion with refinement of detail, and which welcomes the best efforts of the painter and sculptor in a loving combination of art, cannot be easily banished from the modern practice of the civilised world." Its spirit, at all events, is not likely entirely to die, in whatever different and even eventually improved forms it may hereafter exhibit itself.

THE LATIN PLAYS: ILLUSTRATIVE OF EDIFICES, AND OF EDIFICATION.

No word is more frequent in the mouths of the playwrights than "construction,"—well-constructed dramas, badly-constructed, loosely-constructed, defectively-constructed,—in fact, to listen to them, construction sometimes seems the main difficulty of the craft. Wit, repartee, incident, character, sentiment, humour,—these are the flesh and blood; but construction seems to deal with the skeleton, which is the support and foundation of all.

So far, dramatic construction agrees with architectural, for it would seem that the best materials may collapse if badly put together; but, in truth, the terms do not bear parallel interpretation in the two arts. The dramatist's notion of construction is the distribution of the subject which he has in his mind into successive scenes which shall gather force and effect from order of succession, and contrast without being confused, provide opportunities for introducing the richest variety of dramatic material, and avoiding tardiness on the one hand, and precipitate revelation on the other, keep interest and enjoyment ever advancing up to the very last scene of all.

So that what a dramatist means by construction answers more precisely to what an architect has in his mind when he is contriving a plan, or more generally, to take a simple example, in combining the various elements that complete accommodation in an ordinary house. Both artists have a main purpose that governs throughout. The dramatist has, or ought to have, a primary theme, a specially characteristic collision of interests or feelings, of which the speciality is put into lively evidence by the varieties of humanity selected to be brought into apposition with it, or opposition. It is, in fact, when the author fails to bring out a decisively marked and interesting characteristic by shifting about from one theme to another, so that no one is predominant, or when he does not seem to know how to work out the proper resources of the theme that he has undertaken to develope, that as an architect looks on he is reminded of apartments disproportioned to each other, passages that lead to nothing or trespass on space ill-spared by rooms, and all appropriate juxtapositions and communications neglected, and even some omitted entirely.

If ever an architect has such sins on his conscience,—that "guilty creature sitting at a play" can never be more conscience-stricken than when he recognises a very compendious re-

flection of his errors in the "Adelphi" of Terence, agreeably represented otherwise as it may be before Mr. Cockerell's scene in the old dormitory of Westminster.

The fault lies with the ancient Roman, not with our young moderns; if, indeed, it is not rather to be carried back to the Greek, from whom Terence borrowed most of his play, if he did not translate his original frankly and freely. The Roman dramatist made no scruple of such borrowings; there was the less reason in one respect that he should, as the author of the Greek original had been dead and gone some century before, and there was no possible question of unexpired copyright. The only point of honour which the prologues admit obligation to, is not to re-adapt a Greek comedy that some contemporary Roman compatriot had already laid hands on. Even so ancient was that "courtesy of the trade,"—known to the present generation as dignified respect for the first appropriation of an English author's work,—that has just expired among American publishers.

The extraordinary flatness with which these Roman plays conclude is noteworthy. If there is one principle most honoured by the modern dramatic constructors, it is that all main interests that have been roused in the course of the action shall contribute more or less to excitement and subsidence at the conclusion. This lameness at the last is observable in Plautus as much as in Terence. Only in one of the twenty plays of Plautus is there anything approaching to a comprehensive interplay of dialogue in a last scene; the exception is the "Asinaria." Otherwise we might have charged the defect upon the Athenian Diphilus, from whom Terence took the "Adelphi,"—Diphilus, who, if an epigram can be trusted, was apt to err by frigidity. Thus it runs, preserved to us by Athenæus:—

> "Gnathæna! wine I never drank
> So cool as yours; once more refill it."
> "My Diphilus! yourself you thank;
> 'Tis with your comedies we chill it."

To return to the "Adelphi"; the construction is, of necessity, unsatisfactory from a flaw in the original scheme. Two brothers are brought up,—one by his father, another by his uncle,—upon contrasted systems of extreme severity and extreme indulgence. Both turn out equally dissipated, and the play ends with the severe father reconciling himself to allowing his pupil even greater licence of irregularity than his brother had always taken advantage of unchecked. The laugh is turned against the disciplinarian when it proves that his own pupil was the misdemeanant in riotous conduct of which the brother, with no character for steadiness to lose, had kindly borne the blame; and against the easy-going uncle when his good nature is imposed upon, and he is forced to carry out his principles by manumitting slaves right and left, and to take a wife at a moment's notice of whom he knows nothing. Elegance of language and versification nevertheless retain the interest of the audience for an action in which there is so little to excite sympathy in any but the abettors of lax morals in the young, and so little to stimulate laughter except for those who side with a triumph over the weakness or corruption of the elderly. Such was the judgment of Julius Cæsar, most distinguished of all the long line of theatrical critics, who admitted, in six excellent *vers de société*, the charm of the style of Terence, and so far gave him the credit of being half what Menander was, but complained of short allowance of the *vis comica* that was so unfailing a distinction of the Greek.

His nephew, Augustus Cæsar, seems to have been of the same mind, for his predilection was decided for the old-fashioned plays of Plautus,—so Suetonius tells us, and this goes far to explain the querulous expostulations of Horace, who, in his long epistle to Augustus, makes a hard fight to assert the superiority of the new school of poetry, and to persuade the emperor out of his better senses, that the old poets had nothing more to recommend them than the fact that they were old, a merit which, give it time, contemporary poetry would enjoy no less.

As regards the particular issue between Terence and Plautus,—Plautus with whose volumes Erasmus said he would be content to go on, give him but the New Testament as well,—let us appeal unto Augustus Cæsar, and cite the elder poet to speak for himself, and to speak a speech which always commends itself to ourselves, redolent as it is of bricks and mortar. It is the better, if not spoilt in the translation, for being read with the thought how it must have been enjoyed by the friend of Colet and Sir Thomas More, the author of that repertory of wit and wisdom, "The Encomium of Folly,"—"Encomium Moriæ."

But a word first as to comparative moralities. Plautus, who drew from the same Greek fountain-head the New Comedy of Philemon, Diphilus, Menander, and the rest, is quite as ready as Terence to adopt and adapt a plot of which the chief interest turns on the success of the young in cheating and debauchery, and can always find opportunities for exuberant wit, and for as much true humour as is consistent with restriction to certain well-established types of character. We are the more taken by surprise when, in the single instance of the "Captivi," in both prologue and epilogue, he makes a merit,—exceptionally among comedians he declares it,—of having presented a play which is free from any immoral stain either in language, characters, or incidents,—one by attending which those who are already good may become still better. And yet one word more for Plautus. He has given a representation of maidenly modesty that would be beautiful in the fiction of any time, and could scarcely be expected on the comic stage of the ancients. The daughter of a worthless old sycophant is required by him to help a plot by personating for a time, without further consequences, a woman of loose life and conversation. She protests to the utmost of her power, but in vain, and the picture is touching of how she preserves what dignity she may in the dialogue in which she is required to bear a part, by ingenious ambiguities of language that go some way to preserve her sensibility from admissions that her soul rebels against. But now turn we to the promised speech.

In the second scene of the first act of that most amusing play, the "Mostellaria,"—the "Haunted House," we may translate it,—*Philolaches* soliloquises, though with a not unusual occasional reference to the audience:—

> "I've long and often thought and argued deep,
> And in my heart (if I have any heart)
> Have long debated and revolved, What's man,
> Just born, to be compared to? and have now
> Found out his likeness. Man is a new house,—
> I'll tell you how; and though you think it not,
> I will convince you what I say is true.
> When you have heard, you'll think and say as I do.
> Lend me your ears and you shall hear my arguments,
> For I'd have all as knowing as myself.—
> As soon as e'er an edifice is plann'd,
> But it up in taste, and polish'd to exactness,
> The architect's commended; and his house
> By all approved; each takes it for a model
> And spares no pains, no cost to have one like it.
> But when a tenant comes, unthrifty, mean,
> Neglectful, with a lazy family,
> The fault is straight upon the building laid,—
> Good in itself, but kept in bad repair.
> Then, as it often happens, comes a storm,
> Demolishes the tiling, spoils the gutters,
> And the too careless owner takes no heed
> The damage to repair. A shower succeeds,
> Washes the walls, the roof admits the water,
> The weather rots the builder's edifice,
> The house grows worse by use; and in all this
> The architect is not at all to blame—
> A great part of mankind affect delay;
> And if it cost them money to repair it,
> Delay it still till every wall fall in,
> And the whole's then anew from the foundation.
> Thus much for buildings. Now, how men are like them.
> First, then. All parents are their children's architects;
> They first lay the foundations and then raise
> The superstructure of their education.
> They carefully add firmness; that they may
> Become good men and be an ornament,
> As well as use and safeguard to their country.
> And to such end they spare nor cost nor pains;
> Expense on this account they count for nothing;
> Refine their manners, teach them letters, laws,
> And by their cost and care endeavour still
> That other men should wish their children like them.
> Then to the army. There their fathers place them
> Under protection of some great relation;
> And so they pass out of the builder's hands
> Ere they have served a year. You then may see
> A sample how the building may turn out,
> For I myself, as long as I was under
> The builder's hands, was sober all the time,
> And honest. But as soon as e'er I follow'd
> My own inventions, I at once undid
> All that my architect had done before.
> Then enter'd Idleness, and was the storm
> Brought on my hail and rain; quite overthrew
> My modesty and each restraint of virtue,
> And utterly untiled me. Heedless I
> Again to cover in my edifice;
> Love like a torrent rush'd into my heart,
> O'erflow'd my breast, and soak'd quite through my soul;
> And now my fortune, credit, and fair fame,
> My virtue and my honour all have left me:
> By negligence, I'm grown still worse and worse;
> These rafters are so ruinous, so foul,
> With rotting moisture, that, by Pollux' temple
> I see no means remain to patch it up.
> The whole must fall, and its foundations fail
> Without a hand to help me."

Surely, now, the poet deserves that we should by anticipation respond to his appeal as the curtain fell,—or rather rose,—for such was the Roman way:—

> "The play is finish'd; give us your applause."

THE LATE MR. ANTHONY SALVIN, ARCHITECT.

THE late Anthony Salvin was the son of General Anthony Salvin, of Sunderland Bridge, in the county of Durham, and the representative of that branch of the ancient family of the Salvins of Croxdale. He was born, October 17th, 1799, was educated at the Durham School, and passed many of his early days with his uncle, the Rev. Wm. Nesfield, at Brancepeth Rectory. The restoration of Brancepeth Castle was then going on, and the youth, much interested in the operations, it may be, acquired the taste for architecture which determined his choice of the profession he followed during the remainder of his long and active life. He came to reside in London about 1820, and with his future brother-in-law, William Nesfield, the painter, mixed in the society of the art-world of that time, Turner, Prout, and others, and was for a short time in the office of Nash when the elder Pugin was in the office. He was elected into the Society of Antiquaries in 1824, and lived to be the oldest member. Salvin began practice at an early age, as in 1828 he built Mamhead, near Exeter, for Sir Robert Newman, at a cost of about 20,000*l*., and in the same year Morby Hall for Mr. Henry Preston, at a cost of 40,000*l*., while in 1829 he had the gratification of being called in by Mr. Russell to restore the Great Hall at Brancepeth Castle, the building which inspired his career.

Then followed in quick succession such works as Methley Hall, in 1830, for the Earl of Mexborough; Parham, for the Hon. Robert Curzon; and many others of equal importance. Mr. Salvin was consulted for many years on all matters relating to Government castles, and his skill and knowledge of Mediæval fortresses were generally admitted. His careful study of the remains of English and Welsh castles, in all their details, is shown by his sketches, which are admirable for their artistic merit and archæological knowledge. Amongst the most successful of his works may be named Peckforton Castle, which was built from the foundation for Lord Tollemache. He also restored the Beauchamp Tower, and Traitors' Gate, at the Tower of London. The manner in which Caernarvon Castle has been kept from ruin may be credited to Salvin's influence in high quarters, and his enthusiasm for our ancient work.

At Windsor Castle he considered himself somewhat controlled in the restoration of the Curfew Tower; but in all things he earnestly endeavoured to be conservative. Alnwick Castle was restored by Salvin for Algernon, Duke of Northumberland, between the years 1852 and 1861. This was his great work, and the outlay was large. The decoration of the interior was controlled by the Duke, who insisted on its being carried out in the Italian Cinque-cento style, and for this purpose Cardinal Antonelli, at the Duke's behest, persuaded Commendatore Canina to come from Rome with a number of Italian artists and carvers; but the whole of the internal work was under Salvin's direction.

Keele Hall, in Staffordshire, near Newcastle-under-Lyme, built for Mr. Ralph Sneyd, between 1855 and 1862, is spoken of as one of the best planned houses in England, from its clever adaptation to the ground. The court-yard is on a low level, and a flight of steps, similar to the ancient arrangement of Parham Court, approaches the great hall on the first floor, on which the principal apartments are arranged, the basement being occupied by servants' offices. The whole shows attention to old work. Amongst his later works, Thoresby Hall, in Notts, commenced in 1864, for Earl Manvers, and finished 1875, is conspicuous; and the restoration of Dunster Castle, for Mr. G. T. Luttrell; Petworth House, for Lord Leconfield; Longford Castle, for Lord Radnor; Encombe Hall, for Lord Eldon; and Birdsall House, for Lord Middleton, are all works of importance. Salvin may be said to have died in harness, at the age of eighty-two years.

As late as last year he was building a house in Chesterfield-gardens for Lord Leconfield, when the growing infirmity of age compelled him to relinquish the task. But his work did not end here, for within the last few months, and greatly at his own expense, he interested himself in the restoration and enlargement of the church in the village of Fernhurst, Sussex, near which he lived during the last seventeen years of his life. His anxiety at the last was that the bells which he had bestowed should be hung in the new

tower and tone his departure. He died on the 17th of December, 1881.

Salvin was a true gentleman that the profession may be proud of, a man of business, and courteous, as all who knew him, employers and employed, will acknowledge. W. E. N.

A list of his works, as far as can be ascertained, is appended,—

Before 1826:— House in Durham.—Dr. Cook. Brancepeth Castle.—Mr. Matthew Russell. Church of Northallerton.
1827. Norwich Cathedral, west front. Harlaxton Manor (or Hall).—Mr. Gregory.
1828. Mamhead.—Sir Robert Newman, bart.
1828-33. Moreby Hall.—Mr. Henry Preston.
1828-33. Somerhill.—Mr. James Alexander.
1829. Brancepeth Castle, Durham, alterations in hall, &c.—Mr. W. Russell.
1830-36. Methley Hall.—Earl of Mexborough.
1831-32. Sunderland Chapel.—Lord Crewe's Trustees.
1831-33. Barley Rectory.—Rev. W. Turner.
1832-46. Farham.—Hon. R. Curzon.
1830-32. Ulverstone new church.—H. M. Commissioners.
1833. Stoke Green House.—Lieut.-Col. Rolfe.
1835-39. Burwarton House, Ludlow. — Hon. G. F. Hamilton.
1835. Grosvenor House alterations. —Marquis of Westminster.
1835-46. South Shields, new church.—Dean and Chapter of Durham.
1838. Keswick, new church.—Mr. J. Marshall.
1836. Cowsley Hall.—Mr. G. Lloyd.
1837. Seaton Carew Parsonage.—Rev. A. Guiness.
1833-35. Durham University.—The Warden and Trustees.
1834. Sheldon new church.—A Committee.
1835. North Runcton.—Mr. Daniel Gurney.
1836. Chalfont House.—Mr. John Herbert.
1836-41. Danesfield. Mr. C. Scott Murray.
1836. Woodlands.—Mr. W. Ley.
1837-43. Scotney Castle.—Mr. E. Hussey.
1838. Shutterskelf.—Viscount Falkland.
1838-40. Rufford Abbey.—Earl of Scarborough.
1839-48. Greystoke Castle.—Mr. H. Howard.
1838-40. Burtonfield, York. - Mr. C. Darley.
1837-45. Heath Hall, Wakefield.—Mr. T. G. Smith.
1839. Moor Park (work in terraces). — Marquis of Westminster.
1839-41. Sand Hutton, near York. -Mr. J. Walker.
1840-41. Durham University.—Warden and Fellows.
1840-45. Worden Hall, near Chorley. — Mr. J. N. Harington.
1840-41. Spittlegate, Grantham, new church.—A Committee.
1841. Kilndown, Goudhurst, new church.—A Committee.
1841. Ley Fields.—Earl of Scarborough.
1841. Willow House.—Earl of Scarborough.
1841. Esholt Hall, new chapel.—Mr. W. R. Stansfield.
1841-42. Sherborne House.—Lord Sherborne.
1841. Grantham, new savings bank.—Trustees.
1841-42. Denton, new rectory.—Rev. G. Potchett.
1842-43. Trinity College, Cambridge, Master's lodge.—The Master and Fellows.
1842-43. Flixton, Suffolk, Priest's house.—Sir R. Shafto Adair, bart.
1843. Ayott St. Peter's Rectory-house.—Rev. E. Prodgers.
1843-45. Arley Chapel.—Mr. R. E. Warburton.
1843-44. Hemel Hempstead Church, restoration.—Churchwardens.
1843. St. Paneras, Christ Church.—Rev. W. Dodsworth.
1844. Cambridge, Church of Holy Sepulchre, restorations.—A Committee.
1844-47. South Otterington Church, rebuilding.—Mr. W. Rutson.
1844-47. Durham Cathedral, rescating choir.—Dean and Chapter.
1844-46. Kelham Hall.—Mr. J. Manners Sutton.
1844-45. Newark Castle, repairs. — Commissioners of H.M. Woods.
1845. Carisbrook Castle, repairs.—Commissioners of H.M. Woods.
1845. Newark, new baths.—A Committee.
1845-48. Castle Rising Church, Norfolk, restoration.—Hon. Col. Howard.
1845-46. Lynn, new church.—A Committee.
1845-46. High Cross, new church, new parsonage.—Lady Louisa Giles Fuller.
1845. Tabley House.—Lord de Tabley.
1844-48. Blickedown House, Haslemere.—Captain Henry.
1844-50. Flixton Hall, Suffolk.—Sir R. Adair.
1846-51. Hafod, North Wales.—Mr. Henry Hoghton.
1846-48. Haworth Castle.—Earl of Carlisle.
1846-48. Pennoyre House.—Lieut. Col. Lloyd Vaughan Watkins.
1846-50. Peckforton Castle, Cheshire.—Mr. John Tollemache.
1846-48. Oxon Heath.—Sir W. Geary, bart.
1845-50. Tatterdale Hall.—Mr. W. Marshall, M.P.
1847. Runcorn, new church.—A Committee.
1847-48. Carnarvon Castle, restoration.—Commissioners of H.M. Woods.
1848. Torquay, new church.—A Committee.
1848. Wern Eynon, additions.—Mr. J. H. Vivian.
1848. South Park.—Viscount Hardinge.
1848. Stapeley House, near Nantwich.—Rev. James Folliott.
1848. Hatfield Hall, Durham University.—The Warden.
1857. Wells Cathedral Choir.—Dean and Chapter.
1849. Greystoke Church, chancel rebuilt.—Mr. Henry Howard.
1849. Shepherd's Bush, St. Stephen's new church.—Bishop of London.
1851. Shepherd's Bush, St. Stephen's parsonage-house. Bishop of London.
1849. Langley Hall, alterations.—Admiral Sir W. Proctor.
1849-51. Rockingham Castle.—Hon. R. Watson.
1849. Finchley Rectory.—Rev. T. R. White.
1849. Lanercost Priory, restoration.—Commissioners of Woods.
1849-51. Freethorpe Church, Norfolk.—Mr. H. Vade Walpole.
Goring, new farmhouse.—Mr. David Lyon.
1850-53. North Wootton Church.—Hon. Mrs. Greville Howard.
1850. Derwent Sole House.—Mr. Henry Marshall.
1851. Lanercost, parsonage-house.—Earl of Carlisle.
1851. Norwich Bank.—Messrs. Gurneys.
1851. Juniper Hill.—Mr. Cuthbert Ellison.
1851. Rothbury Church, Northumberland, restoration.—Rev. Vernon Harcourt.
1851. Sailsbury Schools.
1851. Betshanger Church.—Sir Walter James, bart.
1854. Betshanger Lodge.—Sir Walter James, bart.
1852. Stoke Holy Cross, Norfolk, mansion.—Mr. Henry Birkbeck.
1860. Stoke Holy Cross, Norfolk, farmhouse.—Mr. Henry Birkbeck.
1852. Bangor Castle.—Mr. R. E. Ward.
1852. Highgate National Schools.—A Committee.
1852-55. Balliol College, Oxford.—The Master and Fellows.
1852. Wilderness Park.—Marquis of Camden.
1852-53. Trinity Hall, Cambridge.—The Master and Fellows.
1853. Little Stanmore, new rectory.—Rev. B. Tuson.
1852. Highgate House.—Mr. Harry Chester.
1852-61. Alnwick Castle and estate improvements.—Duke Algernon of Northumberland.
1851-52. Sudbury Hall, Uttoxeter.—Lord Vernon.
1853-57. Torquay, new church, Upton.—A Committee.
1853. Lower Rover Church.—A Committee.
1853. Rose Castle, Carlisle, restoration.—Bishop of Carlisle.
1853. Hugh Legh, new schools.—Mr. George Cornwall Legh.
1853. Aldridge Church.—A Committee.
1853. Worden Hall, New Lodge.—Mrs. Harington.
1853-55. Caius College, Cambridge.—Master and Fellows.
1853. Tatterdale, new church.—Mr. W. Marshall.
1853. Arley Hall.—Mr. R. E. Warburton.
1853. Warboys, new schools.—Rev. W. Finch.
1854. Warboys, rectory.—Rev. W. Finch.
1853. Lympsfield schools, Surrey.—Mr. Wm. Leveson Gower.
1853. Wilby Church, Northamptonshire, restoration of chancel.—Rev. R. Stockdale.
Tower of London.
1853. Beauchamp Tower, restoration.—Commissioners of H.M. Woods.
1857. Salt Tower, restoration.—Commissioners of H.M. Works.
1861-62. White Tower, armoury, council chamber.—War Office.
1864-66. White St. Thomas Tower.—Commissioners of H.M. Works.
1867-68. Warders' new quarters.—Commissioners of H.M. Works.
1867-89. New Jewel Room, Wakefield, St. Thomas Towers. Commissioners of H.M. Works.
1854. North Runcton, additions.—Mr. Daniel Gurney.
1854. Yarmouth Bank.—Messrs. Gurney.
1854. Newfoundland, new church st.—Mr. Thos. Newman Hunt.
1854. Over Tabley, new church.—A Committee.
1854. Queenstown, new club house.—J. H. Smith Barry.
1854. Trinity Hall Lodge, Cambridge. — Mr. T. C. Geldart.
1854. Weaverham Church, Cheshire, restoration.—A Committee.
1855. Scothy New Church, Cumberland.—Mr. G. Head Head.
1855-63. Keele Hall, Staffordshire.—Mr. Ralph Sneyd.
1855. Headley New Church, Surrey.—Hon. Mrs. Greville Howard.
1855. Lindisfarne Abbey, restoration. Commissioners H.M. Woods.
1856. Hartford, Huntingdon, new house.—Mr. W. H. Desborough.
1856. Abbotts Ripton, Huntingdon. — Rev. P. P. Rooper.
1856. Rock Church, Northumberland, restoration.—Rev. N. W. Bosanquet.
1856. Buckworth Rectory.—Rev. J. D. Shafto.
1856. Upper Tooting, new church.—A Committee.
1856-58. Marbury Hall, Cheshire.—Mr. J. H. Smith Barry.
1856-57. Carlisle County Hotel.—Mr. Geo. Head Head.
1857. Trinity College, Cambridge, alterations.—The Master and Fellows.
1857. Shouldham Thorpe Church, Norfolk, additions and restoration.—Sir. Thomas Hare, bart.
1857. Great Badworth Church, alterations.—A Committee.
1857. Diddington Hall, Huntingdon.—Mr. Geo. Thornhill.
1857. Dutton Chapel. Lord de Tabley and Mr. J. H. Smith Barry.
1857. West Cowes Castle, Isle of Wight. — Commandant Royal Yacht Squadron.
1857. Silkstone Church, Yorkshire, restoration.—Mrs. Clarke.
1857. Vine Cottage, Cambridge.—Professor Selwyn.
1858. Church Fenton, restoration of church.—A Committee.
1858. Sherburn Church, Yorkshire, restoration.—A Committee.
1858. St. Mary's-the-Great, Cambridge, chancel.—Trinity College.
1858. Durham Library, restoration, &c.—Dean and Chapter.
1859. Congham Hall, Norfolk.—Mr. R. W. Elmes.
1859. Somerford Hall.—Sir C. Shakerley.
1859. Farham Church, Cumberland.—A Committee.
1860. Torquay, St. Mark's new church.—A Committee.
1860. Torquay, St. Matthias's new church.—A Committee.
1860. Mears Ashby Hall, Northamptonshire.—Captain Stockdale.
1860-62. Horsley House.—Mr. J. R. Hildyard.
1860-68. Trinity College, Cambridge; the Master's Court; the Master's Second Court. — Rev. W. Whewell, D.D.
1861-62. Aberford Church, Yorkshire, restoration, &c.—A Committee.
1862. Tupton House, alterations.—Lord Churston.
Churston Schools.—Lord Churston.
1861-62. Windsor Castle, embankment wall and 100 steps; new guard-room; Bell and Garter Towers, restoration; Henry VII.'s Library, restoration; Waterloo Gallery, restoration; Norman Tower, restoration; grand staircase.—Commissioners of H.M. Works.
1862. Windsor Castle, Oratry Tower, restoration.—Dean and Chapter of Windsor.
1862. Bolton-le-Gale Church, restoration.—A Committee.
1862. Whitehall, Cumberland.—Mr. Geo. Moore.
1862-66. Muncaster Castle Cumberland.—The late Lord Muncaster.
1863. Flixton Church, restoration.—Sir R. S. Adair, bart.
1863-66. Warwick Castle.—Earl of Warwick.
1863. Whickham Church, Durham.—A Committee.
1863-64. Tynemouth, new churches, viz.:—North Shields; Whitley; Percy Main.—Duke of Northumberland.
1864. Cambridge Free Grammar School. — Caius College.
1864. Crossrig Hall.—Colonel Rigg.
1864-65. Cambridge, new museums.—The Senate of the University.
1866. Cambridge Anatomical and Chemical Schools.—The Senate of the University.
1864-75. Thoresby Hall and stables.—Earl Manvers.
1864-73. Brancepeth Castle.—Viscount Boyne, the late.
1866-69. Capesthorn Hall, part by Mr. A. S., jun.—Mr. A. H. Davenport and Mr. W. H. Bromley Davenport.
1866. Lazonby, new church.—Mrs. Maclean.
1866. Nateby Scures Church, restoration.—Colonel Carleton.
1866. Stanwick Parsonage. — Dowager Duchess of Northumberland.
1867. Stanwick Church.—Dowager Duchess of Northumberland.
1866. Parkhurst, new house.—Mr. Cotsford Burdon.
1867. Windsor Great Park, the Royal Chapel.—Commissioners of H.M. Woods.
1867-68. Fawsley Hall.—Sir Rainald Knightley.
1867. Hampton Court Palace, rescating Royal Chapel. —Commissioners of H.M. Works.
1868. Worth Maltravers Church, restoration.—Earl of Eldon.
1868. Simonbrom Church, restoration.—Colonel Chateris.
1869. Northumberland House, new ball-room.—Duke of Northumberland.
1869. Albury House, Surrey.—Duke of Northumberland.
1868. Windsor, new stables.—Dean and Chapter of Windsor.
1869. Hutton Hall.—Sir H. Vane.
1869-70. Worth Church, Sussex, restoration.—A Committee.
1869-72. Dunster Castle.—Mr. G. F. Luttrell.
Paddockhurst.—Mr. Geo. Smith.
1870. Virginia Water, royal fishing cottage.—Commissioners of H.M. Woods.
1870-72. Petworth.—Lord Leconfield.
1870-75. Longford Castle, in progress Christmas, 1875.—Earl of Radnor.
1871. Flixton Parsonage. Sir Shafto Adair, bart.
1871-74. Encombe Hall, Dorsetshire.—Earl of Edon.
1871-72. Cumberland Lodge, Windsor.—Commissioners of H.M. Woods.
1872. Melbury House.—Lord Ilchester.
1872-74. Rogate Lodge.—Mr. Hugh Wyndham.
1872-74. Muncaster Castle; Church; Parsonage.—Lord Muncaster.
1872-75. Bridsall House, Yorkshire.—Lord Middleton.
1873-75. Osborne House.—Mr. C. S. Roundell.
Burwarton Church.—Viscount Boyne.
1875. Thoresby, new church.—Earl Manvers.
1876. Sedgefield Church.—A Committee.
1875-78. Greystoke Castle.—Mr. Henry Howard.
1876-77. Burwarton Hall.—Viscount Boyne.
1877. Cumberland Lodge, Windsor Great Park.—Commissioners of H.M. Woods.
1878. Royal Lodge, Windsor.
1878. Longford Castle.—Earl of Radnor.
1878-79. No. 9, Chesterfield-gardens, Mayfair, new mansion. —Lord Leconfield.

BERLIN AND PARIS.

The building activity which at present seems so universal in the great cities of the world,—in New York, where "flats" are being erected with a rapidity that anywhere else than across the Atlantic would be extraordinary; in Vienna, as has been noticed in these pages; in England, as our readers know well; in Paris, as recent accounts amply show,—is no less remarkable in Berlin. In the German capital new buildings are rising, and new means of communication are being laid out, chiefly, it appears, at the West End, a feature to be remarked in most capitals, arising probably from the fact that it is the south-westerly winds that prevail in the year, thus leaving the atmosphere of the west end clear. In Berlin this rule holds good: squares, public gardens, and public promenades, planted, of course, with the favourite linden and chesnut trees, and amply supplied with granite seats, are being laid out. The Bourse is being enlarged, and a new bridge is to cross the Spree, obliging the opening of a new street and the widening of several others in the neighbourhood. It is, however, as previously remarked, at the West End, in the fashionable neighbourhood, that building is most active. It was here that was recently opened by the Crown Prince the Industrial Museum,* a magnificent quadrangular three-storied edifice, which cost over three millions of marks, the work of the architects Gropius and Schmieden, a museum containing a mass of artistic treasures, among them Dr. Schliemann's Trojan antiquities, and a choice selection from the Prince of Wales's Indian collection. In addition to the museum, now completed, is being built a new theatre, to be as im-

* It will be remembered that the Crown Princess did not neglect on this occasion to refer in a few feeling words to the work of her father, Prince Albert, in the direction of technical education.

portant as any of the existing Berlin theatres, the Wilhelm Theater, the Friedrich Wilhelm, or the Victoria. The name of the new house has not been determined on, decision hovering between the Augusta or the West-end Theater. We may rest assured that the sad series of accidents which have lately been so terribly frequent in the theatres of the great capitals, will cause all due consideration to be given to the point of the safety of the public, and the recent and most terrible of all these, in the twin German capital of Vienna, will lead to still further precautions being taken in this direction. Such events seem to come cruelly to force lagging improvements, — improvements which, at the same time, can avail but little where panic is found to paralyse those very persons behind the scenes who, at such moments, should have about them their utmost presence of mind; it is alone by rehearsal of the part to be played by each in case of fire that its real presence can be combated. Firemen are never flustered; in the recent Cheapside fire we saw how fire-drill rendered a number of young warehousemen excellent aids to the fire-brigade. In this matter of fire-drill at the theatre, our own experience can fully confirm the statement of a writer to one of our daily papers, who mentions the successful action at the Munich Court Theatre (on the occasion of a fire there some time since) of the iron curtain,—dropped every night after the performance, and thus kept in perfect working order,—and the shower-bath taps behind the scenes. Here, as in every other point of its model management, which should be studied by all theatrical managers, the Munich Court Theatre showed that its *personnel* was admirably drilled.

In Paris, the building activity to which reference has so often been made continues apparently unabated. Here again, as in London and Berlin, it is at the west or fashionable end that the masons are busiest. The district between the Trocadéro and the Champs Élysées,—already so crowded with rich American and English residents,—is rapidly filling with huge five-storied stone mansions, in the construction of which enter none of those restricting considerations of short leases such as hamper so seriously the builder in England. In the Rue Pierre Charron (the former Rue de Morny) where the building activity is especially remarkable, there are several houses being erected worthy of notice as differing from the familiar Parisian type. One of these, at the end towards the Trocadéro, is, we learn, being built by the Comtesse de Gueridas, and is intended to serve as a museum of Roman and Egyptian antiquities, which, when completed, will be presented by the owner to the City of Paris, a princely gift; near this house the "Nationale" Insurance Company is erecting a group of magnificent dwelling-houses, five stories high, and which have now reached the third floor. The Paris Insurance Companies have been lately largely adorning the capital with the edifices they have been erecting each block, — they are to be found scattered over the fashionable quarter, in the Boulevard Haussmann, the Champs Élysées, and elsewhere,—bearing on a highly decorated marble tablet the name of the company by which the house has been erected. It can be understood that in this investment of their capital,—the returns from which in Paris are ample,—the companies insure the solidity of the work. It would be desirable, were our leasehold laws differently conceived, to see this plan more largely adopted on this side of the Channel. At no great distance from the "Nationale" Insurance Company's block, in the Rue Pierre Charron, is being erected a comparative novelty in Parisian street architecture, not too largely broken by eccentricity; a wealthy manufacturer of electric apparatus is building a two-storied house, the façade to be adorned with coloured faïence, and two large medallions, one to receive a clock, the other a barometer. It is to be a novelty in the direction of polychromatic architecture.

Before we leave the Trocadéro, let us not forget to mention,—as bearing on a subject recently alluded to in these columns, the artistic value of collections of casts,—the opening of a portion of the Cast Museum at the Trocadéro. At the time of the death of the late Viollet-le-Duc, reference was made in these pages to the scheme the eminent architect had drawn up of forming a Museum of Casts, to show the development of French sculpture as applied to architecture. The Commission of Historic Monuments took up this excellent idea, and since 1879 the special sub-commission,—which included among its members such well-known names as M. Proust, the present Minister of Fine Arts, M. du Sommerard, and Viollet-le-Duc fils,—has met almost every week; the result of this energetic action is the museum now opened at the Trocadéro Palace, one wing of which has been set aside for the purpose. Seven divisions have been made for each century since the twelfth, and a workshop and warehouse supplied in the cellars. No fewer than 300 specimens have been already gathered, some of considerable size, over 30 ft. long. At present only two rooms, those devoted to the twelfth and thirteenth centuries, have been opened, but these, as may be imagined, supply an ample fund of most interesting inquiry. The memory of the ex-minister, M. Ferry, and his Under-Secretary for the Fine Arts, deserves to be cherished for this fresh addition to the artistic treasures of the capital and its numerous educational establishments. Above the door of the new museum, it may be mentioned, has been placed the following label,—"Commission des Monuments Historiques. Musée de Sculpture comparée." It is in museums of this kind that the artist obtains that historical knowledge of his profession that leads him to further inquiry, and that love of the great works of the past that must leave an enduring impression on the works of the present and the future.

We have not yet done with Paris, where the progress of the new Hôtel des Postes is deserving of mention. The works, which, when some months ago we saw them, were still below ground, have now, with the rapidity for which building in Paris is famous, reached the first story, and some idea of the general appearance of the building can be formed. The new Post-office will be a large quadrilateral. There are to be three stories above the ground-floor, which latter is to be devoted entirely to the service of the public, and the yard to the mail-carts. On the first floor the letters are to be sorted; on the second, delivered to the carts. It is on this floor that the officials are to be lodged. On the third floor are the books and documents, and the store-rooms. Below ground will be situated the stables, the stamping-rooms, and the pneumatic apparatus. A double balance lift is to place all the floors in communication. A gallery, some 60 yards long, on the ground-floor, will contain, ranged on each side, in addition to the telegraph bureau, all the various other departments for the public convenience,—offices for registered letters, sale of stamps, &c., and an information bureau. The new Post-office, it may be remarked, when completed, will serve alone for the Paris correspondence, the country and foreign service will then be transferred to the residence of the Minister of Posts and Telegraphs. The new Post-office has already knocked a considerable amount of daylight into the gloomy and once fashionable quarter in which it is situated, and the value of land has, as may be imagined, risen to astounding prices, even for Paris.

As a last note from Paris, it may be mentioned that the neighbouring Bank of France is about to be enlarged on the western side, and the Rue Radziwill, a street which, though within but a few yards of the Palais Royal and the "Strangers' Quarter," we feel sure many an old visitor to Paris scarcely knows, will be built over. Eminently signs of the times these, the enlargement of the Bank and the Post-office.

As for the announcement of another Industrial Exhibition to be held in Paris next year, the professional world must wait till some further details are made known than those which have so far appeared.

Though there are those who have been recently telling us that they have a right from personal experience to state that the seasons have changed, winter still brings with it the need for fires; the heating of our houses, bringing in its train the necessity for the consideration of the appalling quantity of smoke produced, may fairly be said to be the burning question of the day. We hear of it in every quarter, discussed as it has never before been discussed; we have been for generations satisfied in England with our open grates and well-filled coal-scuttles, for we have long since ceased habitually to burn wood as our neighbours the French continue to do. There, as indeed with us, among middle-aged persons, the importance attached to the fire and its management is a marked feature of winter life. Every one must have met among his acquaintances some member whose pleasure it is, tongs in hand, to make up the fire, with infinite care piling up little piece of coal after little piece till the edifice is complete. In France, among the relics of the old society, there remain, just the same, those who regard themselves as the sole possessors of the secrets of fire-building, and fortunate is the outsider who may happen to meet any one kind enough to explain to him the art and mystery. He learns, in the first place, perhaps after breakfast on some wintry morning, that a servant is, and ever will be, incapable of making a fire, and then, tongs in hand,—*badine*, as the long flexible instrument is called,—the informant begins to build up the fire over the log or *buche*, each piece of wood touching its neighbour with due spaces for draught, the whole crowned with a mass of charcoal embers from the grate beneath. This, the morning fire, one is told, is made of hornbeam, oak, or apple wood, which, compact in fibre, generously distributes its heat and leaves a glow of embers. The after-dinner fire is very different it is to be made up exclusively of beech wood,—the champagne of combustibles,—helping the digestions of the diners by its brilliant, cheery aspect, spurting out from time to time in sparkling flashes on the group gathered round the fire. We can imagine our wood-burning forefathers enjoying something of this luxury of fire-building, the joy of the old, the consolation of the solitary. Prosaic, smoky coal has even seen wound round it some romance with its fire-pictures, and the slumbering embers, the cleanly cannel in our coal-consuming country being the champagne of the English hearth; but the days of coal now seem numbered, and gas is ruling triumphant, as in the distance looms the production of heat by dynamic energy.

THE EXCAVATIONS AT OLYMPIA.

AT a recent meeting of the Society of Architects of Berlin, Professor F. Adler delivered an address on the results of the excavations at Olympia. The diggings were commenced on the 4th of October, 1875, and, after six laborious seasons, were brought to a conclusion on the 20th of March of the present year. The entire expense of the series was defrayed by the German Government and the German Emperor; and in return Germany was permitted to appropriate any duplicates of objects found in the course of the excavations.

Professor Adler, who shared with Professor E. Curtius the honour of chief place in conducting the work, pointed out that these excavations were only intended to resume the task which the French had commenced in the year 1829, but which, notwithstanding that numerous important finds of ancient remains were made, they never carried beyond the preliminary stage.

The centre of Olympia, Professor Adler said, was undoubtedly the altar of Zeus. This, however, had manifestly been at a later time removed from its first and original position on the Kronos Hill to a spot that had been identified by the objects found on it, in the valley of the river Alpheios. Not far from the centre stood the altar of Hera, and a little further still the heroes' place of Pelops. This was enclosed with walls and planted with sacred trees. At a little distance further stood the shrine of Demeter, the mother of the gods. The four spots here mentioned formed, as could be shown from history, the starting-points around which gathered in the course of time a number of structures, large and small, devoted to a great variety of purposes. First we have the extensive Temple of Hera, which was in the Doric style; a little further, the hypæthral Temple of Zeus; and then, on the southern declivity of the Kronos Hill, an entire row of twelve treasure-houses close together. At a later date there was added the Prytaneion, with the sacred altar of Hestia, a building intended for the authorities at the contests and for the reception of the victors. Next we find extensive galleries or stands covered in, which were intended to afford a shady spot for the spectators of the festival processions; further, the Bouleuterion, probably used by the managers of the contests and of the sacred enclosure generally. Then there was a peculiarly-formed group of structures with two long and extensive side buildings and a square building in the centre, containing the altar of Zeus Horkios, where the competitors in the athletic struggles used to take the oath to observe the rules of the contest. The laying-out of the grounds on which the Olympic games were held proved to be exceedingly simple. The chief

spots were the Stadion and the Hippodrome; the latter had been for the most part effaced by the inundations of the Alpheios, so that it could only be very imperfectly identified. The remains had been found of the Gymnasion and Palaistra, and other buildings where the young athletes went through their courses of preliminary training and practice. One place, which in later centuries had been turned into a Christian church, appears to have been the actual *atelier* of Phidias, in which that sculptor prepared his celebrated chryselephantine statue of Zeus. Several buildings that were evidently of the Roman period had been only touched, and not completely laid open. The entire grouping of the numerous buildings which had been laid bare at Olympia shows that the ancient Greeks understood well how to turn the peculiarities of the site to the best advantage, both for the purposes of religion and of the festive games.

The task the expedition for excavations had before it was not only to clear up our notions respecting the size, plan, and general aspect of the chief centre of Greek festivals, but also to seek for any plastic remains that might still be discoverable on the site. Of bronze objects, such as were common in the earlier periods of Hellenic art, the excavators were unable to find a large number. It is probable that most of the bronze remains of value that were still in existence in the sixth century, A.D., were carried off by the invaders who plundered Olympia at that time, and perhaps repeatedly smelted and employed for other purposes. One of the most important objects found is the portrait-bust of a Greek who is unknown, but who was three times a victor at Olympia. This is a work of the first order. No less valuable are several heads of Zeus, and a variety of other objects, including several large archaic bronze reliefs, metallic vessels, weapons, and weights, as well as many well-preserved fragments of statues, such as arms, hands, and feet.

The number of marble groups and statues found is 130. In the number there are thirty figures with heads. Of the twelve metopes of the Temple of Zeus, with the twelve labours of Hercules, all except one have been found in a more or less complete state of preservation, so that a general reconstruction of the series will be feasible. Among the statues, as the world has already learned, the great acquisitions are the Nikè of Paionios and the Hermes of Praxiteles. The latter is, beyond question, the gem of the whole series of the plastic works discovered. It is, indeed, an object of priceless value. By its help it is possible for us for the first time to form an adequate judgment of a Greek original by an acknowledged master of the first rank in marble statuary.

Another most important class of discoveries is the inscriptions. These are numerous, and extend from the earliest times to the fourth century of the Christian era. There is a wide field for study in these literary remains. The same may be said of the numerous coins and smaller bronze articles which have been obtained.

As regards the architectural remains, it was of great interest to find, if possible, any examples or types of any classes of structures that might have hitherto been unknown, while, on the other hand, in the case of known styles the remains could not fail to be of value for the comparison they would enable us to make with existing or known structures. Among the former class of hitherto unknown edifices may be mentioned the Palaistra, the Prytaneion, the Bouleuterion, and the treasure-houses. These really fill up a large gap in our knowledge of Greek life and architecture. The comparison of the remains found at Olympia with the Greek edifices hitherto known is a task on which scholars and architects are still engaged, and on which they will probably yet have to spend much time before the results of their labours can be known, and before it will be possible to reconstruct on paper or in model the different separate buildings. It is a gratifying fact that the number of architectural remains found at Olympia is very extensive. Their preservation is due to the circumstance that when the barbarians from the North invaded Greece, and swept over the Peloponnesus, the latest Greek inhabitants of Olympia built strong walls round their district, and were compelled for this purpose to pull down and employ many of the old monuments and buildings.

During the concluding series of the German excavations, great attention was paid to that often obscure and neglected portion of architecture,—the question of the underground work and foundations. This portion of the work was entrusted to Herr Gräber, and he had succeeded in identifying, within a comparatively small area, no fewer than 120 distinct sets of drains or pipes, intended some of them for carrying off sewage, others for bringing water to the different edifices. Herr Gräber found the pipes to be of various materials and dimensions. The levelling, on investigation, showed that both in the sewage drains and in the pipes for water supply the natural fall of the ground had been taken advantage of throughout, and that reservoirs at an elevation had been employed.

Another class of objects abundantly found consisted of roofing-tiles. These had been systematically sorted and arranged, and the result showed beyond dispute that the well-known and greatly-admired marble roof of the Greeks had been preceded by a long period of development, when ceramic tiles only were in use, before the perfection that was still acknowledged had been attained. The oldest roof among the Olympian edifices was probably that of the Temple of Hera, and this exhibited the well-known style of "monks and nuns" common in Mediæval times.

One of the most important discoveries was that of the Treasury of Gela, which had only been found in the latest stage of the excavations. This had in front a colonnade, while it had two gables or pediments at the sides, thus presenting three aspects. The architecture at the summit of this stone building consisted of pieces of terra cotta, of bright colour, and fastened by nails. Herren Dörpfeld and Borrmann, two of the German officials employed at Olympia, on their journey home visited Sicily, and found that terra-cotta materials had been similarly employed in the Greek settlements there, at Selinus, Gela, Akræ, and other places. It appears, therefore, now certain that this style of building was pretty general among the Greeks about the fifth or sixth century B.C. The different kinds of terra-cotta exhibit the most varied and interesting transformations. Thus the waterspout may be followed through various developments, from a simple plain pipe to the richly-ornamented lion's mask.

Herr Dörpfeld had further the merit of having thoroughly examined in its technical aspects the much-neglected question of the Greek measures. This he had done by investigating the grounds and buildings at Olympia. After repeated and most careful measurements, Herr Dörpfeld had succeeded in demonstrating from the Temple of Zeus that the normal Olympian foot was 0·3204 mètre in length. The Stadion was known to be 600 Olympian feet long, and he had tested and proved the correctness of his measurement on the Olympian course itself. It is true that there was an earlier measurement of the foot prevalent about the time of the tyrant Pheidon, and by measurements on the Temple of Hera this foot was shown to be equal to 0·297 mètre. The later edifices erected at Olympia were based on the Roman foot, which was only 0·296 mètre in length. It is somewhat surprising that of the best known and commonest measurement among the ancient Greeks, namely, the Attic foot, there was no trace at Olympia. This is probably due to political jealousies, as there is at Olympia not a single trace of the Attic style of architecture. The Athenians, we know, were not popular with the Greeks of the Peloponnesus. The Doric, Ionic, and Corinthian styles, on the other hand, are all represented in the most varied combinations.

Finally, it is to be noted that at Olympia has been found the oldest specimen of the vaulted style of architecture of ascertained date. This is at the so-called secret entrance to the Stadion, which was used by the competitors and judges at the athletic games and contests. The passage is 100 Olympian feet in length, and each vault is constructed of fourteen wedge-shaped stones connected by bronze fastenings. There is also a second very interesting, but later, vaulted structure. This is the so-called Exedra of Herodes Atticus, the Sophist, and dates from the second century A.D. This latter work is specially deserving of attention, both on account of its peculiar construction and because it has traditionally exercised an influence on later works of the kind down to the period when the High Renaissance was flourishing at its prime.

Balmoral.—Mr. A. Anderson, architect, has been appointed Inspector of Buildings for the Queen at Balmoral Castle, in place of Mr. J. Beaton, retired.

THE CITY OF CHESTER.

Amongst British cities, Chester stands alone. Alike in its history and its architecture, in its commerce, in its walls and walks, in the public spirit of its citizens, the quaint old city presents a contrast to many much larger. It is changing, however, in this railway age, and round that antique inner circle of walls there is growing up a newer Chester that is commercial in its character, and that is contributed to by the position of the old town as a railway centre and by the visitors it attracts. Far away from the haunts of our early commerce, Chester has its history lost in remote ages, and whether its origin was with the great-grandson of Noah, whether with the early Britons or Roman colonists, certain it is that in the days of the Cæsars, forum and temple arose on its site as one of the legions there settled, and the tokens of the presence of the conquerors are many eighteen centuries after their days. And of these centuries Chester may say that "Saxon, and Norman, and Dane" it was; and that after the Conquest it, down to the days of the first Edward, was the scene of Welsh incursions and English revenge; and that in more modern times it has been the theatre of war, and from its walls monarchs have watched the fate of armies on whom their crowns depended. But from the time of the Civil War, Chester has kept on the even tenour of its way, and the growth of newer ports nearer the sea has lessened its trading importance. But since the era of railways the old city has received a strong impulse, and there has been very great development in recent years. That development may be best seen by a glance at some of the facts that tell its state in the past and in the present. About two score years ago, then, Chester had its nine churches, and half a dozen chapels; its infirmary was well off for funds; it had other charitable and philanthropic institutions. Its industries included lead, chemicals, and shipbuilding. Railways had not entered it, but its canal furnished cheap conveyance to Liverpool. Its population was some 21,300, and was slowly increasing. A dozen coaches passed through the town daily, and there were several "regular traders" by water; but trade languished for want of facilities, and Liverpool was beginning to tap the trade of the old town. Since then, Birkenhead has also arisen, and many of the old industries have passed away, and now there is little that is distinctive about the trade of the town. It has still its lead-works, and other of its manufactures, but the trade of its port has gone beyond recall. The city has gained, however, that which arises from its position, and from its being the centre of eight branches of railways at least, and in the trade that has grown thereout there has been more than a counter-balance, as the fact that its present population is 40,342 fully testifies. And there has been, as we have hinted, a corporate progress of the town that is fully entitled to notice, if brief.

Enter the city by that great general station (or even by that later and vast if less used structure that the Cheshire lines have had erected for them), and some idea of its importance is at once evident. Into that older station six lines converge; its roofs are said to cover over 123,000 square feet, its great platform is 1,000 ft. long, and it is computed that 3,000,000 passengers pass through it yearly. Near to it is the first and the largest of the series of stately hotels that Chester has,—one erected at a cost of 20,000*l*. The erection of that station may be said to have diverted in considerable degree the traffic of Chester, and to have made needful new bridges and buildings that have been supplied. Indeed, the extent of the renovations, restorals, and rebuildings in Chester may be said to have changed the town in the past four or five decades. Its ancient cathedral has been restored, additions have been made to old churches, and new ones have been built. Its post-office was enlarged a score of years ago; its old infirmary has had a new wing; the English Presbyterians have erected a new and stately church; the Wesleyans have been obliged so to alter and modernise that old chapels have been re-erected or altered, whilst to many, schools have been added. Barracks have been built for the militia, a drill-hall for the volunteers; whilst savings-bank, music-halls, banks, convents, have all contributed to the change that has been wrought in the appearance of the city in the decades we have named. Not the least of the changes is that of the town-hall which attests the public spirit of the citizens of Chester, and

lifts its central tower high above the noble halls and stately and ornate rooms. Nor is that great gift of the Marquis of Westminster, the Grosvenor Park, of twenty acres, with its trophies and statues, to be omitted as showing what has been added to the corporate provision by princely munificence for the recreation of the people of Chester.

A walk round those famous walls that for two miles enclose the earlier city, and that bring up to memory the builders of the distant ages: from them are seen the old town, with its newer additions, a mingled mass of towers, spires, and ancient dwellings alternating with those of more modern date. A glance at its curious "rows," where the first floor becomes the pavement, and there is a general sense on the part of the passer of doubt whether he is on the roof or in the cellar,—these curious old arcades are part of the picture of Chester that cannot be omitted. One of the writers too little read just now,—Albert Smith,—has described this curious feature of this old world city in one of his works in words that do not need to be now reproduced. But some of the quaintest of the old houses that are intersected by these rows have of late shown signs of decrepitude, and it is many years since that most famous one,—Providence House,—had to be rebuilt, though so well is the old mingled with the new that it needs the inscription, "Reconstructed 1862," on one of the beams to remind the passer of the change. These old gable-fronted houses are full of memories, and that known as Bishop Lloyd's House, with its square of carved Scriptural scenes, may be said to be one of the curiosities of Chester. And it is worthy of note that though the lapse of time and the work of decay's fingers renders repairs and reconstruction at times inevitable, it is generally done with some appreciation of the beauties of the old place and some attempts to revive its methods. Needless to say much more of the "rare old city." Of the glories of its "Roodee" we need not treat. Its citizens are public-spirited, as schools of design, infirmaries, and councils show; the efforts of the latter have made the death-rate a moderate one; and around the old and venerable town there are the signs of an extension that is not dependent upon any one industry, but is the result of the appreciation of the position and the attractions of the town. And it needs but a continuance of that public spirit, a provision for fuller wants of visitors and residents, to cause the rare old city to still more bask in the prosperity of the present whilst remembering that of the past with respect.

SALE OF A BUILDING ESTATE AT CHINGFORD.

MESSRS. FOX & BOUSFIELD lately submitted for sale at the Auction Mart, Tokenhouse-yard, a freehold estate, of 78 acres in extent, situated in Chingford. The property was described as being on the verge of Epping Forest, and about one mile from the Chingford Station on the Great Eastern railway. It was stated that there was an old-fashioned and commodious family residence on the estate, standing on an elevation immediately opposite the ruins of the old parish church, and commanding a fine view over picturesque scenery; and also four cottages. The entire property was said to be let on lease for a term of seven years from September, 1878, at a rental of 300*l.* a year, one of the conditions of the lease being that any portion of the land required for building was to be given up on six months' notice. The first offer made was 9,000*l.*, and the property was ultimately sold for 12,000*l.*, with the view of being laid out and resold for building upon.

Tramway Statistics.—A return has been published recently relating to street and road tramways down to June 30th this year, which shows the remarkable growth of tramways in public favour since 1876, when they were first generally introduced into this country. The capital authorised to be raised by shares in 1876 was 3,141,000*l.*; it is now 7,602,509*l.*, and of this amount 5,096,030*l.* have been paid up, and this, added to the sum raised by loans and debentures, makes the total amount expended 6,939,838*l.* There are 488 miles open for public traffic. The stock of the companies comprises 15,220 horses, 40 locomotive engines, and 2,045 cars. There have been 205,623,510 passengers carried down to June 30th this year; the gross receipts were 1,576,301*l.*; and the net receipts, after paying working expenses, 336,405*l.*

PROGRESS IN PRESTON.

AMONGST the Lancashire towns, whose material advancement within the last few years is indicated by the public buildings which have been erected and are in progress, Preston claims notice, more especially so at the present moment when preparations, architectural and otherwise, are already being made for the exceptionally historic festival, held every twenty years, which is intended to be celebrated in 1882.

In anticipation of the coming celebration several undertakings of a constructive character are now being carried out. The Corn Exchange, which was erected in 1824, and which, with the several spacious rooms in connexion with it, has for many years past been utilised for public meetings and entertainments, is at present entirely in course of reconstruction, and being converted into a large public hall. The external walls only remain, the building internally being completely transformed and greatly increased in height, whilst westward it is being considerably extended by the erection of an entirely new block, containing a range of several apartments in connexion with the general public purposes to which it is in future to be applied. The building, when completed, will be 230 ft. in length by 95 ft. in width, covering a ground area of nearly 22,000 superficial feet. The principal entrance to the interior of the building will be on the east side, leading into a circular vestibule 17 ft. in diameter. Through the vestibule a spacious entrance-hall, 34 ft. by 28 ft., is reached, having on each side several retiring-rooms and lavatories. From this entrance-hall the large hall on the ground-floor is approached. It is 147 ft. in length by 63 ft. in width, having a promenade on the north and south sides 16 ft. in width each, which can be either added to or partitioned off the main body of the hall at any time, by means of revolving shutters. The full width of the hall and promenades will thus be 95 ft. When used for meetings, concerts, or other similar purposes, it is estimated to seat an audience of 1,500 persons, for whom seven exits will be provided. At the west end of the hall there will be an orchestra, 44 ft. in width by 36 ft. in depth, designed with special regard to orchestral performances, and having accommodation for 300 performers. At the rear of the orchestra there will be a spacious organ-chamber, for which a powerful organ is now being erected by Mr. Wilkinson, of Kendal, at a cost of 3,000*l.* The instrument is the gift of a Preston merchant. The front of the organ-chamber will be an important feature in the work, having ornamental pilasters, with elaborate capitals and spandrels, with enriched plasterwork, modelled from special designs of the architect. In the new portion of the building, at the west end behind the orchestra, there will be ladies' and gentlemen's retiring and waiting rooms on the ground and first floors, with kitchens, heating apparatus, and storage rooms in the basement. The entrance for the band and principals, on musical occasions, will be from the waiting-rooms on the ground-floor, whilst the entrance for the chorus will be on each side of the organ-chamber, from the waiting-room on the first floor. Above the promenades galleries will be carried along the north and south sides, and also at the east end opposite the orchestra, the last-named gallery being circular on plan. Behind this gallery there will be a balcony or promenade, 8 ft. in width. The galleries and balcony are estimated to hold an audience of 1,500 persons, and will have four separate entrances and exits. The fronts to the galleries will have a handsome brass railing, with wrought-iron scroll-work between iron columns 14 ft. apart, with ornamental enriched capitals which spring from circular arches. Above these runs an enriched plaster frieze and cornice, surmounted by a cove to the underside of the ceiling, the latter being perforated by a series of circular lights. The hall will be heated by hot water, and lighted by three sun-burners in the ceiling, each having a large extracting-shaft for carrying off the vitiated air. The first floor over the principal entrance at the east end contains a spacious assembly-room, 102 ft. in length, and 45 ft. in width. The architect is Mr. Sykes (of the firm of Messrs. Garlick, Park, & Sykes), of Preston, and the contractor Mr. R. Saul, also of Preston. The estimated cost of the building, exclusive of the organ and fittings, is 10,000*l.*

The Free Library, Museum, and Art Gallery new buildings, to be erected at a cost of 60,000*l.*, part of the fund bequeathed to the trustees for that purpose by the late Mr. Edmund Harris, a well-known townsman, are about to be proceeded with, and it is confidently expected that the Prince of Wales will lay the foundation-stone of the building during the guild week next year. Active preparations are now being made for commencing the undertaking. The corporation have agreed to provide a site for the building, at an estimated cost of 30,000*l.*, and an Act of Parliament having been obtained for the purpose, the site will shortly be cleared. The structure will occupy a ground area of about 26,000 superficial feet, and will have four distinct frontages, being completely isolated from the neighbouring buildings. The principal frontage,—130 ft. in length,—will be on the east side of the Market Place, being the west front, and forming a fit architectural companion to the north elevation of the late Sir Gilbert Scott's noble Gothic production, the Town Hall, completed and opened a few years ago. There will likewise be a frontage on the east side, of similar length, facing Lancaster-road, a fine thoroughfare of upwards of 50 ft. in width, which has been opened out within the last few years. The north and south frontages will each be 160 ft. in length, facing two proposed new streets, of 50 ft. in width, which are about to be constructed by the corporation, under a comprehensive street improvement undertaking, intended to be carried out in connexion with the erection of the Free Library buildings. The designs for the buildings have not yet been prepared, and we are therefore not in a position to state what style of architecture will be adopted, but in anticipation of the foundation-stone being laid in September next, by the Prince of Wales, as above stated, we understand that the plans will very shortly be in the hands of the Harris trustees, at whose expense the building is to be erected. It is said that there is a strong probability of the designs being entrusted to Mr. James Hibbert, a local architect, who has taken a deep interest in the undertaking, and who has already erected many of the public buildings in the town. This probability receives force from an article on the subject which recently appeared in the leading columns of the *Preston Guardian*, and from which we make the following extract:—

"We are getting an admirable new Mayor, but we are also parting with a not less able and worthy retiring Mayor. In Alderman Hibbert we have a member of the Council who brings to all he has to do untiring zeal, inflexible straightforwardness, and the highest intelligence. The office of Mayor has lost nothing of its honourable tradition while in his keeping. He has served the Corporation well in every department of its business, but his exertions in connexion with the Free Library deserve especial commendation. His 'Notes on Free Public Libraries and Museums,' privately circulated in pamphlet form, have been sought after by many promoters of such institutions, and are proof of his great industry and ability. In order to procure the materials, and to make himself fully familiar with all the systems of working public libraries, he visited most, if not all, the principal libraries in the kingdom; and we believe he has mastered the conditions requisite for the planning and structural form of a perfect building for library and museum purposes more thoroughly than any other man within reach. During his year of office he has seized every opportunity to further the interests of the Preston Free Public Library. We trust that his restoration to health, and freedom from the cares of office, will permit him to devote himself in the succeeding years to the superintendence of the erection of a building which shall be at once a stately and splendid memorial of the Harris family, and one so skilfully adapted for its intended uses that the utmost degree of benefit from the liberality of Mr. Harris may be reaped by many future generations of citizens of the ancient borough of Preston."

The structure will include lending and reference libraries, a reading and news-room, together with a museum and art galleries. It is intended that when the building is completed and opened, the cost of its care and maintenance shall be defrayed by the corporation.

On a site on the north side of Fishergate (the principal thoroughfare in the town), covering an area of 32,000 superficial feet, which has been acquired at a cost of a little more than 5,000*l.*, a very extensive block of buildings has for some time past been in course of erection, which are intended for the constabulary and all other business purposes belonging to the county, Preston being the centre where all executive business connected with the Palatinate is transacted. The buildings, which have a frontage to Fishergate, nearly opposite the railway-station, of 160 ft. in length, with a return frontage on the east side, in Pitt-street, of 200 ft., are 54 ft. in height, and contain three floors, besides the basement. They are faced with red brick and Minera stone, from the Welsh quarries near Wrexham. The principal elevation is that in Fishergate. The several floors contain ranges of three-light mullion windows, and the frontage

is surmounted by nine ornamental gables, enriched by a free introduction of sculpture which includes the arms of the county palatine on shields, the "red rose of Lancashire," and the Prince of Wales's feathers. There are three projecting entrances, massive cantilevers supporting elaborately-carved canopies. The Pitt-street frontage is, in its main features, uniform with the Fishergate elevation, with an entrance, principally for the magistrates, at the north end. The eastern portion of the buildings contains the offices belonging to the clerk of the peace's department, the treasurer, and the auditor, together with a spacious apartment for the meetings of the magistrates of the county, another large apartment for the storage of the county records, the magisirates' dining-room, and other apartments; whilst the western portion of the block is set apart for the business connected with the county constabulary. This last-named part of the buildings is already completed and occupied, and the other portion is expected to be finished about June next, the interior works being now in progress. Within the building there is an open area from the basement to the top, faced with white enamelled bricks. The basement contains kitchens, stores, and several apartments for the sergeants and other members of the constabulary force. On the ground-floor a corridor, 6 ft. in width, and extending the entire depth of the building, from the Fishergate frontage, gives access to the various offices. The floor of the corridor is laid with polished concrete marble, manufactured in Germany, and the walls are faced with a dado in white and grey enamelled tiles. The offices of the clerk of the peace, the deputy clerk of the peace, and the several clerks' offices, are on this floor, as also the record-room, the magistrates' dining-room, and stationery-room. A spacious stone staircase, approached from the Pitt-street entrance, leads to the court-room on the first-floor, in which the annual meeting and other meetings of the magistrates of the county will be held. The size of this room is 63 ft. by 45 ft., and its height from the floor to the apex of an ornamental lantern-light 45 ft. The lantern-light is glazed with embossed coloured glass. Its dimensions are 44 ft. by 16 ft. The offices of the county auditor, the treasurer, the bridgemaster, and those of their subordinates, are also on this floor, along which there are corridors, uniform with those on the ground-floor, and similarly paved with polished concrete. An octagonal staircase, in Hopton Wood stone, from the Derbyshire quarries, having Dalbeattie polished granite columns at the foot, leads to the several offices in the upper parts of the building. The second floor contains what are designated spare rooms. All the record-rooms, which will contain documents of great value, are fireproof. Mr. Littler, of Manchester, is the architect, and Mr. John Walmsley, of Preston, the contractor. Mr. W. Fox is clerk of the works. The sculpture work is by Mr. Miles, who executed similar work at the Town Hall. The estimated cost of the entire building is 50,000*l.*

The new station, the joint property of the London and North-Western and Lancashire and Yorkshire Railway Companies, which is said to be the longest roadside station in England, although recently opened for traffic, is still incomplete, and at present is being further extended in width in a westerly direction. Some conception of the enormous dimensions of this station may be formed when it is stated that its entire length, from the approach in Fishergate, to the southern extremity of the platforms, is 1,800 ft., or one-third of a mile. The two central or island platforms, as they are called, are themselves 1,360 ft. long, or upwards of a quarter of a mile in length each, and 50 ft. in width. Between these two platforms there are three blocks of buildings 40 ft. in width, and carried to a length of upwards of 600 ft. The north block contains four spacious waiting-rooms, 40 ft. by 30 ft. each, and unusually lofty, together with the station-master's office. The central block contains the first and second class refreshment-rooms, 100 ft. in length; and also the grand dining-saloon, 70 ft. long, and capable of seating 300 persons. The express trains between London and Edinburgh and Glasgow, stop twenty minutes at Preston for dinner. Both the refreshment-rooms and dining-saloon are luxuriously fitted and furnished, and the floors are laid with ornamental encaustic tiles. The south block contains another general waiting-room, of the same dimensions as those already named; together with what are designated re-booking offices, or auxiliary booking-offices, in addition to the principal booking-offices at the entrance to the station. Also telegraph-offices, transfer, parcel, and other spacious offices which are occupied by Messrs. W. S. Smith & Sons. In addition to these, there are also the buildings, with booking-offices, waiting-rooms, and platforms on the east side of the station, which are specially set apart for the traffic of the Lancashire and Yorkshire Company. The station, when completed on the west side, will be about 400 ft. in width. There are at present twelve lines of rails, and the station is covered in to the entire length of the platforms with a light iron girder-roof in three bays. A short distance to the south of the station, on a high level, very considerably above the railway, the company are erecting a large hotel, an illustration of which has already appeared in the *Builder*. The building, which is in red brick, is almost externally completed, with the exception of a prominent tower, now in progress. The site of the hotel is on the summit of a beautifully laid out park, which slopes down to the margin of the river Ribble, and from which there is a commanding and extensive view of the valley beneath, and of the surrounding country for many miles in the distance. On the east side is the lofty eminence called Hoghton Tower, which has an interesting place in history as having been visited by James I.; the Rivington Hills; and other places inland, extending to the borders of Yorkshire; whilst on the west side the winding course of the Ribble is discernible down to its mouth, between Lytham and Southport. The hotel is intended to be approached from the railway platforms by an ornamental bridge thrown over the line leading to garden grounds, which are about to be formed on land between the railway and the hotel, at present covered by warehouses and sheds.

The West Lancashire Railway, a new line between Preston and Southport, is at present in course of construction. A section of the line, about eight miles in extent, from Southport to Hesketh Bank, in the direction of Preston, has already been completed and opened, and the works on the remaining portion to the Preston terminus have for some time past been in progress. The heaviest portion of the work is that part of the line which is carried over the valley of the Ribble by an embankment, and thence across the Ribble itself by an iron girder bridge of five spans, and in continuation to the intended station at Preston, on a stone viaduct of twelve arches. The bridge is 320 ft. in length, the central span being 64 ft., and the other spans about 51 ft. each. The girders will rest on stone piers, for the construction of which coffer-dams have been made, but the contractors have met with considerable difficulties in consequence of the coffer-dams having been swept away on three occasions by storms and floods. Owing to a project on the part of the Ribble Navigation Company for lowering the bed of the river, the contractors have been compelled to excavate from shore to shore, to a depth of 10 ft. down to the solid rock, and this has increased their difficulties. One of the piers is already in position, and coffer-dams for the others are being constructed. Several of the arches of the viaduct on the Preston side of the river are already completed, and it is expected that the line will be finished and ready for opening during next summer. The engineers of the line are Messrs. Brunlees & Fox, and Messrs. Braddock & Matthews, of Southport, are the contractors.

Several buildings of a public character have been erected in the town within the last few years, notably in Fishergate, where the street architecture of that locality has undergone great improvements. Amongst other structures may be enumerated the Lancaster Banking Company's premises, the Preston Banking Company's buildings, the new Post Office, the Preston Gas Company's Offices, a fine Gothic structure, both externally and internally; the Reform Club, the Conservative Club, and the refacing of the theatre. The Manchester and County Banking Company are also about to erect new bank premises in Church-street, opposite the Town-hall.

It may be added that the town is rapidly expanding in several directions, more especially northwards and north-westward, on the banks of the Ribble, where building is actively going forward. The population of the town, which in 1871 was 84,000, has within the last decade increased to 94,000.

IMPORTANT DOCK IMPROVEMENTS AT LIVERPOOL.

For some time past the shifting course of the sand deposits in the bed of the river opposite the docks at the south end of Liverpool has materially interfered with the shipping in that locality, the south docks having, during the last few years, been comparatively deserted, to the great loss of the inhabitants of Toxteth Park, and the district immediately around, in which they are situated. This has led to the Dock Board resolving upon carrying out improvements of an important character in several of these docks. At the meeting of the Board last week, Mr. Lyster, the dock engineer, presented a report on the subject, in which he stated that the question of deep sills for facilitating the working of the dock system was of such vital importance to the trade of the port that he had lately thought it well to give consideration to the possibility of providing an extra depth over the sills leading from the river into the Herculaneum half-tide dock, as well as a corresponding extra depth, not only in that dock itself, but also throughout the new system now in course of construction at the north end of the estate. He suggested the desirability of lowering the Herculaneum sills and dock to the levels of 10 ft. and 13 ft. respectively below the old dock sill datum, and, in addition, he suggested that he should be authorised to construct the sills of the main passages of the new docks, as well as the body of the docks themselves, to the level of 10 ft. and 12 ft. respectively. These suggestions met with the warm approval and sanction of the Board, Mr. Harrison, in moving their adoption, observing that this deepening of the sills and docks would enable vessels with large cargoes to enter the docks, and it would be a great advantage to the south end of the port. He observed that ultimately it would no doubt be connected with the Brunswick Dock, but whether that had to be deepened would be for the Board to say a few years hence. It was, however, he remarked, impossible to overestimate the advantages that would arise to the south-end trade. Mr. Brocklebank, one of the oldest and largest shipowners in the port, and who was for several years chairman of the Dock Board, said it was one of the greatest improvements that had been proposed for a great length of time. The advance of shipping was so rapid that it was scarcely possible to look ahead sufficiently far in order to accommodate every description of vessel. The estimated cost of the works thus sanctioned is 16,000*l.*

THE CASTLES OF SKENFRITH AND WHITE CASTLE, OTHERWISE LLANTILIO.

SKENFRITH CASTLE.

Among the numerous strong places in Monmouthshire, which, from their character and position, seem to have been thrown up during the occupation of that border territory by the Mercians and the English during the eighth and following centuries, Skenfrith holds a conspicuous place. Its fortune, moreover, was to be adopted, like Caerleon and Grosmount, by the Norman invaders, who placed a keep upon its ancient mound, and girdled its elevated platform with walls and towers of considerable strength, so that it became of even greater importance in the twelfth and thirteenth than in the preceding centuries. It stands in the deep valley, and upon the bank of the Munnow, five miles below the castle of Grosmount, and six above that of Monmouth on the same river, besides which it forms the south-eastern point of the celebrated Monmouthshire trilateral, Grosmount and Whitecastle being the two others, so celebrated in Border warfare, and especially in the contest between Henry III. and the Mareschals, earls of Pembroke. Churchyard writes of them as,—

> "Three castles fayre, are in a goodly ground,
> Grosmont is one, on hill it builded was;
> Skenfrith the next, in valley it is found,
> The scyle about for pleasure there doth pepe.
> Whit Castle is the third, of worthie fame,
> The country round doth bear Whit-Castle's name;
> A statelie seate, a lofty princely place,
> Whose beauty gives the simple scyle some grace."

Unlike the elevated and rock-founded castles of Chepstow and Ludlow, the strength of Skenfrith was in the low and marshy character of its position. The Munnow flows within a few feet of its walls, and overflowed into its ample ditches, and a few yards below the castle is the bridge mentioned by Leland. Skenfrith marks the uniting point of

several valleys, and even now, with the advantage of modern roads, is by no means easy of approach. Probably, in some measure on this account, it has suffered but little from additions or alterations, and as little from violence. Time, the greatest but least violent of revolutionists, has been the principal agent in the changes that have taken place, and the great obstacle to the study of the castle by the antiquary is the rich and redundant mantle of friendly ivy by which it is draped.

Skenfrith belongs to that family of castles of which Coningsborough and Launceston are the English types, and of which Brunlais, and, in some degree, Tretower, are local examples. Its keep is a cylindrical tower, with a widening or battering base, to which the elder antiquaries gave the name of a Juliet. This stands within an inclosure formed of curtains and bastion towers, in this instance forming a trapezium in plan, of which the northern and southern sides are 74 yards and 71 yards, and the eastern and western 31 yards and 59 yards. The diameters of the area, measured across the keep, are,—northern and southern, 48 yards, and eastern and western, 57 yards.

The keep stands unconnected with the curtains, and nearly on the central line of the area, about ten yards from its eastern end. It crowns a low mound, about 6 ft. high, and 50 ft. broad at the top, evidently artificial. If the mound ever had a proper moat, it has been long filled up. The tower is about 40 ft. high, and may have been 5 ft. or 6 ft. more. It is a cylinder of 36 ft. in diameter, with walls 7 ft. thick. 10 ft. above the ground is a bold half-round string or cordon, below which the wall batters, and at the base is 10 ft. thick, augmenting its diameter there to about 42 ft. The present entrance is to the west, by a doorway of 5 ft. 6 in. opening, having an interior door opening inwards, and probably having had an exterior door also, but the doorway is now a mere breach in the wall, with but a fragment of the rebate of its inner door. The masonry, and the absence of bar-holes, show this doorway not to be original. Probably it was opened in the Decorated period, when passive strength was less an object, and a first-floor entrance was found to be inconvenient. Such later openings are common in keeps with closed basements. There is one at Pembroke.

The basement chamber is circular, 22 ft. 4 in. diameter, and its floor is at the ground level. In it are two loops, with flat tops, in recesses splayed to an opening of 3 ft., of which the cills are 3 ft. from the ground. The wall is quite plain, and there is no trace of a well. This chamber was 11 ft. high; no doubt, a store-room, and must have been entered from the chamber above by a ladder.

The first floor, of the same diameter, was 14 ft. high. This was the principal chamber. The floor was of planks resting upon four large beams laid across, the outer beams receiving the ends of some shorter timbers laid at right angles to them. The doorway points about west, and is partly over that of the basement. It was 5 ft. broad, and its passage-vault was round-headed, but the ashlar dressings are gone. There is no trace of a portcullis. In the substance of the wall is a square hole, probably once containing an oaken tie, such as was used at Brunlais and at Rochester. This doorway was evidently the original and only entrance to the keep. To the right of the entrance a second door opened into a mural stair, a fragment of the cylindrical shell of which remains. This led to the second floor and battlements. For its support the external wall is thickened by a half-round buttress, solid below, and ascending to the summit. The door and the staircase are utterly ruined. In this floor are two window openings in flat-sided recesses, apparently round-headed. The windows, probably large loops, are broken away, and the ashlar face of the recesses is gone, but the relieving arch in the wall is flat pointed. Near the north recess is a corbel of Decorated aspect, 6 ft. from the floor.

The second story, entered by the winding mural stair, is much obscured by ivy. Its floor was of stout plank, resting upon a large single cross-beam, of which one support, a broad plain corbel, remains; the planks fitted into a rude groove or chase, not a set-off, in the wall, which is, therefore, not diminished in thickness. The curve of this story is a little impaired by a projection connected with the stair; and there is a sort of recess, which may have been the kitchen fireplace, the cooking being usually, in these towers, carried on in an upper floor, as at Castell Coch and Morlais. There were three windows in this floor, but of them little is to be seen, nor of what may remain of the ivy-covered battlements. The main floor was plastered, though thinly. It is evident that the floors were always of timber. The main strength of a tower of this character was passive, the loops and windows counting for nothing in the defence, but no doubt the battlements had a rampart walk, and the roof, therefore, was either flat, or if conical, sprang, as at Coucy, Coningsburgh, Pembroke, and Marten's Tower at Chepstow, from an inner wall. Nothing can be more senseless than, as some modern architects have done, to cover these towers with a conical roof springing from the outer wall, which thus could not be defended in the only way possible with such structures, from above.

The curtain wall of the single ward within which this Juliet keep is placed is 8 ft. thick, and from 30 ft. to 40 ft. high, the contained area being at a level 6 ft. to 10 ft. above that outside, and no doubt raised artificially. The four angle towers were cylindrical, 11 ft. internal diameter, and with walls 8 ft. thick. They have no internal projection, but the angle at each is crossed by a gorge wall, 7 ft. long. Both towers and curtain have an exterior base about 12 ft. high, battering below to a thickness of 10 ft., but without a cordon. Each tower is entered from the gorge by a door of 3 ft. opening, and its basement is elevated about 4 ft. or 5 ft. above the inner court. Each has three loops in recesses 4 ft. 5 in. deep, and 5 ft. 8 in. broad. There are no staircases, though there seem to have been two upper stories, the highest rising above the curtain. The floors were of timber. The arches vary; some are round-headed, others lancet, others drop-pointed. The loops are square-headed. The south-west tower has been taken down, and the present entrance to the place is through the gap.

In the south front, 60 ft. from the west end, is a half-round buttress tower, with no internal projection. The breaches in its interior and exterior faces show it to be solid. Opposite to this tower, in the north wall of the court, is a doorway of about 6 ft. opening, the pointed arch of which is seen just at the level of the court. As the sill of this doorway must be at about the level of the Munnow, it was probably connected with a short canal for the admission of a boat, like what is seen at Tonbridge and Leeds Castles, and at Caerphilly. In this same wall, but close to the north-east tower, is a small flat-sided recess, either a door or a window, and 6 ft. above the court level. If a door, it must have been for the lifting of stores from a boat upon the mill-leat which flows below it.

There is no trace of a regular gatehouse to this court, but a part of the centre of the west wall has been rebuilt with carelessness, and probably represents the entrance. This entrance was likely to have been by a mere doorway in the curtain without a regular gatehouse, like the lesser gateway at White Castle. From this point a slightly-elevated causeway, crossing the court, leads direct to the central tower.

The walls are tolerably perfect, but the battlements have been removed, and the upper stages of the towers are in ruin. It is remarkable that the mural towers are without staircases, and there are no visible mural chambers or garderobes, or, with one doubtful exception, fireplaces, in the castle. The material is the old red sandstone of the district, as was the ashlar. The workmanship is ordinary but pretty good rubble, and the mortar coarsely mixed and freely used. The mill leat, and the Munnow immediately beyond it, form the defences on the north front. Along the other three fronts was a broad and deep ditch fed from the river, and now filled up. As the ground with the walls is 6 ft. to 10 ft. higher than that immediately outside, they are to that extent revetments. It is pretty clear from the appearance that the original fortress was a raised platform, in its centre a mound, and around it a wet ditch, the whole, no doubt, strongly palisaded.

There is nothing of a Norman character in either the plan or details of the structure. The singular form of the area may be but an accommodation in right lines to an irregular earthwork. Had it been Roman, the platform would scarcely have been raised. The keep tower is clearly Early English of the time of King John, or early in that of Henry III. The surrounding walls and towers are of the same date.

The history of Skenfrith is obscure, but it is evident that it was built simply to contain a small garrison, and not at all as a private residence. The area contains no trace of hall, chapel, or kitchen. No lines of foundation are visible, and whatever lodgings were erected were probably of timber, with roofs resting against the wall.

Skenfrith is said, at the entrance of the Normans into the district, to have been held by Bach, a son of Cadivor ap Gwaethvoed, which Gwaethvoed is the reputed ancestor of several families in Monmouthshire and East Glamorgan, and who, or his father, was likely enough to have obtained possession of it during the victorious campaign of Caradoc-ap-Griffith in 1065. The pipe-roll of the first year of John shows the castles of Skenfrith, Llanteilo or White Castle, Kinton, and Ledbury, to have belonged to the king; and in 1205 (5 John) he granted Skenfrith, Llanteilo, and Grosmount to Wm. de Brecs, to hold them as they had been held by Hubert de Burgh, and Geoffrey, Earl of Essex, was allowed 20 marks which he had paid to De Burgh for fortifying them. This probably was the date of the present masonry. John de Monmouth, a powerful local baron, had some claim upon these castles, which was admitted by the king; but nevertheless, in 1219, De Burgh was ordered to have seizin of the three castles forfeited by the defection of William de Brecs. William's heir was Reginald de Brecs, who was in ill-health; he demurred to the decision of the king's court. In 1220 they were held by De Burgh. In 1223 the king had occasion to send a messenger to Skenfrith, and in 1224 the Sheriff of Hereford was directed to send thither to De Burgh 2,000 quarrels (heads of cross-bow bolts), and all through the troubled reign of Henry III. these castles continued to be of great military importance. At the settlement of Wales by his son they probably were allowed to fall to ruin. With most of the surrounding property Skenfrith finally fell to the Duchy of Lancaster. As early as the time of James I. it was presented by the local jury as "ruinous and decayed, time out of the memory of man."

The parish church, containing some fragments of early English or early Decorated date, stands a few yards west of the castle. It contains an altar tomb, bearing the effigies in a sort of trick of John Morgan, who died 2nd September, 1557, and Ann, his wife, who died 4th January, 1564. On the side of the tomb are figures in relief. The armorial bearings are,—quarterly, 1 and 4, Barry of 9, on six escutcheons, 3, 2, 1, as many lioncels rampant, 2 and 3, three towers, in the nombril point a roundel. Evidently these are the arms of Cecil, and point to the connexion claimed by that family with Wales. Another shield bears on a chevron three sprigs, between three spear-heads; crest, an arm embowed grasping a ————. John Morgan is said to have been of Wayne, in this parish.

WHITE CASTLE.

White Castle, called also from the parish in which it stands, Llanteilo Cresseny, and in the records "Album Castrum," stands upon very high ground about five miles east of Abergavenny, and commands an extensive and completely panoramic view over a country eminently characteristic of the old red sandstone. Within the wide circumference are mountains and hills green to their summits, deep valleys, oaks and elms of great size and in great profusion, and pastures of unusual richness. It is not to be marvelled at that the Welsh, having lost so glorious a possession, should strive to recover it, or that the English and the Normans, having won, should spare no labour or expense in the construction of strong places to enable them to retain it.

Unlike Grosmount, Skenfrith, Goodrich, and Chepstow, and the other castles upon the Munnow and the Wye, and the seaboard of the Channel, White Castle is far removed from any watercourse or defensible river, and is only to be reached by a long and steep ascent. It is five miles and a half from Skenfrith, and five from Grosmount, Grosmount and Skenfrith being four miles and a half apart, and forms the western and most exposed point of the celebrated trilateral. Its decay is due rather to time than to violence, for its walls and towers are all standing, and what is wanting are those parts which would naturally give way to rain and frost, or from time to time be removed for the rebuilding of houses and cottages in the neighbourhood.

White Castle is also as peculiar in its arrangements as in its position. It has no keep, and so far it resembles the Edwardian castle; but, unlike those structures,—of which Caerphilly in South, and Beaumaris in North Wales, are

typical examples,—its main defences are confined to a single line, covered, however, at the principal entrance by a walled earthwork or barbican, and at the lesser entrance by a second and rather smaller earthwork, without, or with but little, masonry. Its ditches also are on a formidable scale, both for depth, breadth, and extent, and altogether, both in position and details, it is not inferior in strength to any castle in the March, and is besides in the first-class as regards capacity.

It is composed of a central ward, in general figure hexagonal, but oblong and somewhat pear-shaped, its internal diameter, north and south, being 50 yards, and its greatest cross diameter, east and west, 37 yards. The northern end measures, also internally, 15 yards, the southern 18 yards. The sides next to the north end are, in length, 27 yards, those next the south end 23 yards and 26 yards. The wall is 10 ft. thick at the base, and slopes externally to 7 ft. at a height of 15 ft. In height it is about 30 ft. to the rampart walk or allure. The towers at the two southern angles are 18 ft. internal diameter, with walls 7 ft. thick. The two middle towers are 12 ft., the other two at the northern angles form the great gatehouse, and are 13 ft. They are about 45 ft. high. The four southern towers have a basement floor a little below the court-level, with one loop; a first floor with three loops, and a second floor, whence was a way to the ramparts of the curtain. There seems, also, to have been an upper or third story. The floors were all of timber, and there are no staircases or mural chambers. The gorge valley of the two southern towers are broken away, that of the western partially so; that of the eastern is perfect, and contains the entrance-doorway of 3 ft. opening. The gatehouse towers are also entered at the gorge from the court, but the gorge-wall is thicker, and contains a series of mural staircases ascending to the summit. These are not "turnpike," and are not continuous, but begin anew at each floor. The gateway, concealed, save from the front, by the unusually bold projection of the flanking towers, has a passage 10 ft. wide and 8 ft. deep. The barrel-vault remains, but the ashlar of the internal gate is gone, and its former existence is only shown by a barhole. Of the outer gateway two barholes remain, and a fragment of the portcullis groove, which is 4 in. square, and placed outside the gate, so that the grate was wholly visible even when raised, unless, indeed, concealed by a timber brattice. It was worked from a machicolation between the towers, now gone. The flanking towers are without loops, that to the left on entering is approached from the vault by a narrow doorway. If there was a drawbridge attached to this gate, its heel must have rested upon a large stone about 10 ft. in advance and 6 ft. below the level of the portal. The ditch at this point is nearly 100 ft. broad, and 30 ft. to 40 ft. deep. It is evident that there were no bridge piers of masonry in the ditch, so that the roadway probably rested on trestles.

The opposite and lesser gateway is in the south wall, close to its west end, and flanked, therefore on one side by the south-western tower. It seems to have been a mere opening in the curtain, about 10 ft. broad. It is now a mere breach, but the bar-holes remain. There is no sign of a portcullis. The approach to this gate came up along the edge of the ditch, between it and the wall, from the east, and was commanded by two loops in the curtain and by the south-eastern tower.

The area of the court is quite clear of buildings, but a few heaps of rubbish show that it contained barrack buildings of timber, with stone basements, placed against the walls, which have been plastered. There is no trace of hall, chapel, kitchen, well, or permanent lodgings, and no ornament of any kind; no moulding, no mural chambers or garderobes, no staircase save in the great gatehouse, and only two small fireplaces, in the first and second floors of the north-eastern gate tower. The towers are not only bold and lofty, and about 60 ft. high, but the outer half of these bases is carried many feet down the slope of the ditch giving them great breadth of base, and a very substantial and massive character.

The great barbican is a very remarkable work, not unlike a similar defence at Castle Rising, which there, however, is confined to an earth-work, whereas here the defences are both in earthwork and masonry. The work is irregular in its shape, concave where it rests upon the counterscarp of the main ditch,—on its other faces convex. In depth, or from north to south, it measures about 56 yards; in breadth, 74 yards. It is defended by a ditch of moderate dimensions, which communicates with the main ditch at each end, but is scarce a quarter of its depth. The curtain wall is very irregular in outline, the west side being made up of about four straight pans of masonry, meeting at various angles. The front is a long straight wall, and the east side, also straight, meets it at a right angle. The curtain of this outwork is about 5 ft. thick, and from 15 ft. to 18 ft. high. Upon it are four mural towers; three, drum-shaped, are 10 ft. in internal diameter, with entrances at the ground-floor from the court. In height they rise a story above the curtain. They are looped to the field, have timber floors, and their staircases seem to have been of timber. One tower is angular, and has evidently been the kitchen, part of the oven and the outline of the large fireplace being still visible.

The outer gatehouse is placed at the south-eastern corner of the barbican, terminating its wall and resting upon the counterscarp of the main ditch. It is of rude construction, composed of two solid masses or cheeks of wall, 46 ft. long and 9 ft. thick, rounded at the outer end. Most of the northern wall is gone, and with it the roof or vault of the entrance-passage, and the details of the gateway. This sort of entrance between the high and long walls is found at Coningsborough and Berkhampstead. The other or inner end of the barbican-wall, at the south-west corner, ends abruptly, and probably descended a little way down the counterscarp of the main ditch, so as to prevent an entrance. In the wall is a recess 6 ft. 4 in. broad and 3 ft. deep, which may have been a public garderobe, similar to that in the wall of the middle ward of Corfe Castle.

The lesser barbican covers the south entrance, the way to which does not, however, appear to have lain across it. It is of earth only,—that is, has no walls, but is of great strength; in shape, and indeed in function, it is a lunette. Its diameter, in the direction from the gate outwards, is 20 yards, and its breadth 100 yards. It rests upon the counterscarp of the main ditch, here about 20 yards broad. It has, also, on its front and sides, a ditch of its own about 20 yards broad, and communicating with the main ditch. In parts this work seems to have been revetted. It was connected with the main work or body of the castle by a narrow bridge, which sprang from its eastern angle, and of which traces remain. There does not appear to have been any outer gatehouse at this end; probably the approach was by a boat across the ditch, or by a plank bridge upon trestles.

Besides the above described works there is another and much larger, though less strong, earthwork, which covers the whole east face of the castle, as well as the flanks of its barbicans. It is about 30 yards broad, and outside the main ditch, on which it rests, and upon the ditches of the barbicans. It had also, towards the field, a ditch of its own, now converted into a hollow road. The approach to either gate of the castle, from the east, lay across this outwork, which was probably stoutly palisaded, and intended to give a moderately-safe refuge to the peasantry and their cattle, during invasions from the Welsh.

It is evident from the general design, position, and capacity of this castle, that it was not intended, like Caerphilly, for the accommodation of a great military baron, nor like Morlais or Castell Coch for a mere military port. Its central part is nothing but a fortified area, like Framlingham, where, however, there seems to have been, as at St. Briavel's, a keep. Here certainly there was none. It is and always was a mere shell, composed of a strong and lofty curtain, mural towers, and a gatehouse. There do not appear to have been any of the usual buildings contained within a large castle. The accommodation within the walls seems to have consisted in timber sheds, resting on stone foundations, and built against the walls. In this way a very large number of soldiers might have been accommodated.

Moreover, the capacity for lodging a large body of troops was not confined to the inner ward. The outworks are also spacious and strong, and could contain a small army, or the *élite*, or perhaps the cavalry, of a large one, besides affording accommodation for a considerable herd and flock of cattle and sheep. Such a place would be secure against any ordinary inroad of the Welsh, and supported, as it would be, by the equally strong, though less capacious, castles of Grosmount and Skenfrith, not to mention Chepstow and Caerleon, which were not always in friendly hands, not only would the entrance of a Welsh army into Gwent be difficult, but its retreat, once within the line, would be almost impossible.

As to the age of White Castle, it is difficult to speak positively. The earthworks are not at all of an English, still less of a Welsh, character. Nor, as a general rule, did the Normans ever throw up earthworks on so immense a scale. The masonry is probably of the age of John, or, perhaps, even of that of Henry III., contemporary with Skenfrith, or perhaps a trifle later, and the earthworks may be of the same date. They are certainly designed to suit a castle in masonry, not the mere palisaded residence of a Mercian Thane. They do not at all resemble the earthworks connected with Offa's Dyke, or those known to be the work of Æthelflæda or Edward. On the whole, it seems more probable that, looking to the extreme importance of the position, the early Norman invaders exceeded the usual character of their earthworks, and designed and executed those which are still seen.

The name White Castle,—in Welsh, "Castell Gwyn,"—is said to be derived from Gwyn ap Gwaethvoed, a brother of the reputed founder of Skenfrith, and one of the Welsh lords of this district. If so he must have held it during the troubles preceding and subsequent to the death of Harold, but any works that he may have found or thrown up were probably effaced by those of the present castle. The castle was held, with those of Grosmont and Skenfrith, sometimes by the De Breose family, sometimes by the Crown, and finally by the Dukes of Lancaster. No doubt it shared in the general neglect of the Border castles; that is, of such as were not the seat of any baronial family. In the time of James I. it was a ruin, and had been so beyond the memory of man.

G. T. C.

ROYAL BERKSHIRE HOSPITAL.

The extensions of the Royal Berkshire Hospital having in past years been confined chiefly to the wards, a deficiency in accommodation for nurses and servants became manifest, and the governors in the early part of the present year determined upon the erection of a laundry, servants' wing, new chapel, operating-rooms, &c., and by adding a story to the present nurses' home and outpatients' hall, providing additional accommodation for the nurses, and a museum, library, and students' rooms, for the medical staff.

Our illustrations show the nurses' home and servants' wing, which form a detached building on the east side of the hospital property, and these with the laundry (of which we give an interior view) are connected by a colonnade with the main building.

The new chapel (the interior of which we will illustrate on another occasion) is placed in the centre of the main hospital block, and by covered approaches access is obtained from all parts of the building.

The laundry is being fitted with machinery supplied by Messrs. Thomas & Taylor, of Stockport, worked by steam-power.

The interior of the chapel, museum, library, and students' rooms, will be handsomely fitted in walnut and pitch-pine French-polished, and in all the buildings sanitary and other appliances of approved kind are being introduced.

The work connected with the laundry, servants' wing, nurses' home, colonnade, library, and museum, is being executed by Messrs. Parnell & Sons, of Rugby; that of the chapel and operating-theatre by Mr. A. Sheppard, of Reading; the finishing of the library and museum by Mr. A. Kimberley, of Banbury; the engineer's work by Messrs. Thomas & Taylor, of Stockport; and the whole is being executed from the designs and under the supervision of Messrs. Morris & Stallwood, architects, of Reading, at a total cost of about 15,000*l*.

Architect and Builder.—In Station-road, Snodland, a new church, to be called the New Jerusalem Church, is to be built from plans prepared by Mr. H. Bridge, builder, of Maidstone, who is also the contractor for building the church. The style is Gothic, shape cruciform, with a tower. The church is to be of Kentish rag, with Bath stone dressings.



. DESIGN FOR A COTTAGE HOSPITAL.

. G.E. CARROLL. ARCHT. LIVERPOOL .

Wyman & Sons Printers Gt Queen St



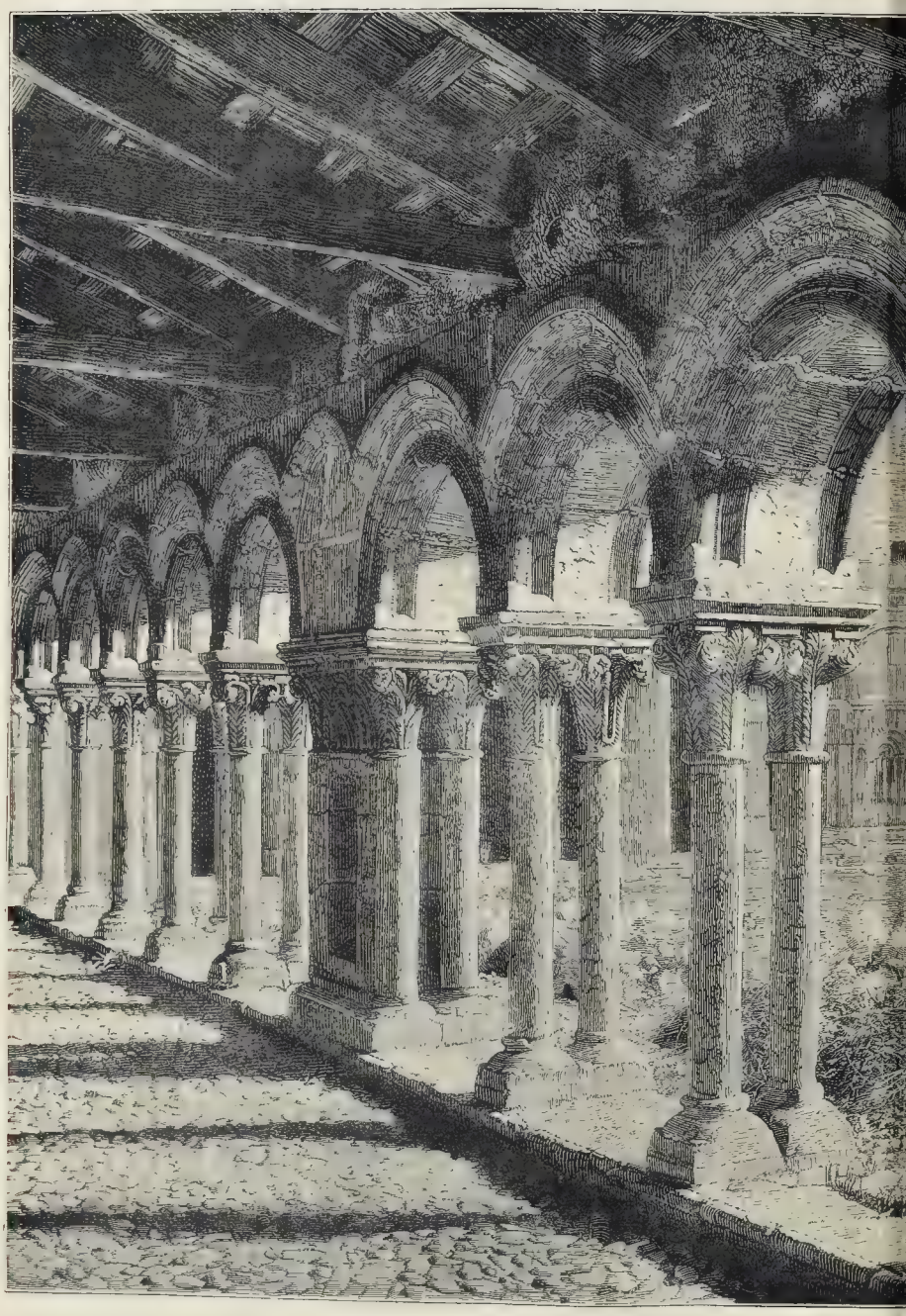
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ROYAL BERKSHIRE HOSPITAL

NURSES' HOME & SERVANTS WING



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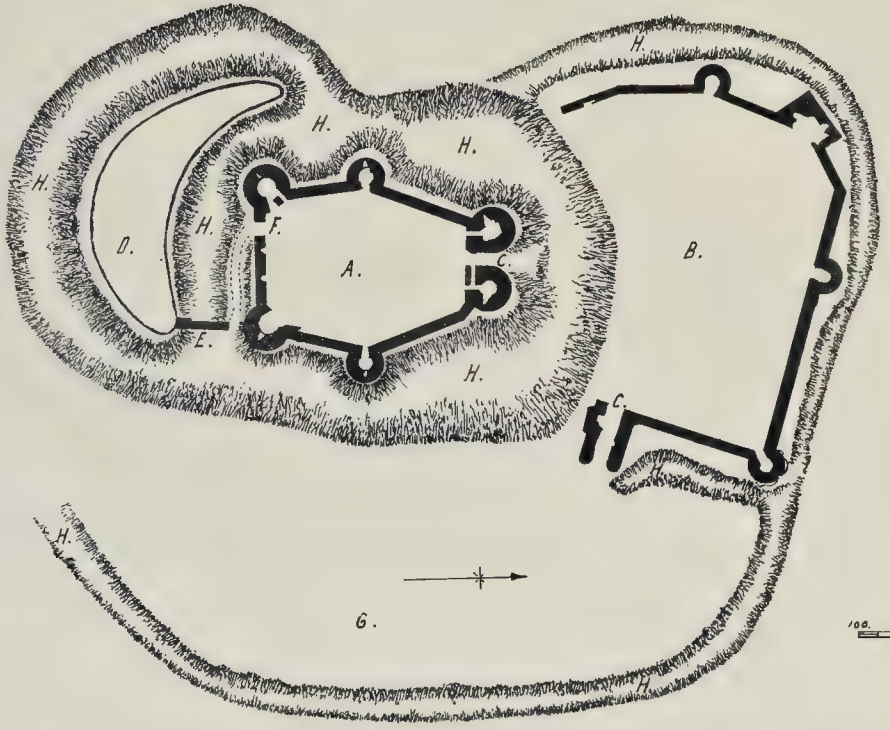
E HUELGAS, NEAR BURGOS, SPAIN.



Whiteman & Bass Photo Litho 236 & 5a Holborn

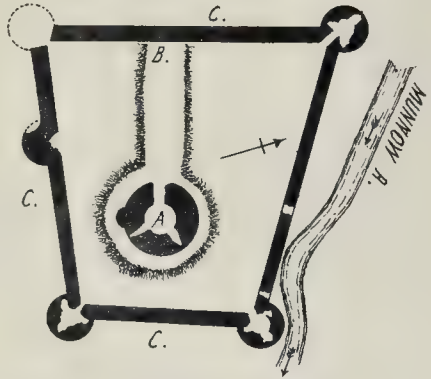
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WHITE CASTLE.



A. INNER WARD. B. GREAT BARBICAN. C.C GATEWAYS. D. LESSER BARBICAN. E. BRIDGE. F. SOUTH ENTRANCE. G. OUTWORK. H. DITCHES.

SKENFRITH CASTLE.



A. THE KEEP. B. THE PROBABLE ENTRANCE.
C. ANCIENT DITCHES.



SCALE OF FEET.

Whiteman & Bass Photo Litho 236 High Holborn

Wyman & Sons Printers Gt Queen St

CLOISTERS OF THE ROYAL CONVENT OF THE HUELGAS, NEAR BURGOS, SPAIN.

SPAIN is the land of cloisters, both in respect of number and beauty. We have illustrated some of them before now. Foremost amongst them are those of the Convent of the Queen Santa Maria of the Huelgas, near Burgos, of which we are able to present a view. We should scarcely go so far as Mr. Fergusson, who says, in his "History":—"It is unrivalled for beauty both of detail and design, and is perhaps unsurpassed by anything of its age and style in any part of Europe"; but we can admire it greatly for all that.

DESIGN FOR A COTTAGE HOSPITAL.

THIS drawing illustrates a design for a cottage hospital proposed to be built in a small town. The object in view has been to obtain a cheerful homely effect, entirely removed from anything suggestive of a public official building dedicated to the sick.

The whole of the accommodation is arranged on one floor. On the left-hand side of the building there is a large operating-room, a dispensary, with separate entrance for out-patients, and two wards for males, together with lavatories, water-closets, and a bath-room. On the right-hand side of the building is placed the kitchen, scullery, and other offices, and two wards for females, with bath-rooms, lavatories, &c., planned the same as those in the male wing. In all, twelve beds are provided.

In the main or centre portion of the building is placed a medical officers' room, a committee-room, a matron's sitting-room and bedroom, the attendants' bed-rooms, and a convalescents' room, which opens out into a covered verandah. The mortuary is away from the building.

The author of this design is Mr. George E. Carroll, of King-street, Liverpool.

THE FUTURE CATHEDRAL OF LIVERPOOL.

SIR,—Approval having been expressed by a correspondent of the *Builder* ("Evacuates") of Canon Venables's suggestion in the *Nineteenth Century* to adopt Wren's unexecuted design for St. Paul's for the Liverpool Cathedral, I cannot, feeling the interest in the subject of a Liverpool man, resist the desire to state some grave objections to that idea which have occurred to me since it was broached.

The unexecuted design of Wren is, it is true, in some respects, superior to the executed one. It shows a compact and simple composition externally; and internally, though not fully adapted to the Protestant service, exhibits a concentration and uniform spaciousness approximating to the ideal of a Protestant church. But with all due deference to Sir Christopher Wren, I venture to assert that its chief characteristic, the four concave façades, is a mistake, and one which he himself would acknowledge were he to live again in the light that has since his days been shed on the sources of sublimity and grandeur. The form he chose for the body of the building is a very suitable one for the abacus of the Corinthian capital, with which it is identical in horizontal section, but it is very unsuitable for the main body of a great edifice, more especially a cathedral, the grave destination of which imperatively demands straight lines and right angles, as most expressive of stability and strength; and without which, a building, though it may please by its elegance and grace, can have but little of that majesty and grandeur of character which should be aimed at in an edifice reared to the honour of God, as well as to contain a certain number of his worshippers.

He was probably influenced in favour of the curved plan by that of St. Peter's at Rome, of which it seems to be the converse, and which represents a cluster of semicircular apses; forms which render that great building less great than a rectilinear Greek cross plan, with its re-entering angles, would have done. But whether led to them by St. Peter's Church or not, the weak though graceful concave façades of the design in question, had it been executed, would have rendered the realised structure a far less imposing pile than the executed cathedral, and excluded that combination of grandeur and grace which should distinguish a great church, the lofty elevations of which should sympathise with the sublimest material works of God.

As to the *style* of the cathedral, I cannot but prefer Canon Venables's suggestion, Classic, to that of your correspondent, "Evacuates," Byzantine. I have not seen Canon Venables's article, except through extracts, but presume that he means by Classic the columnar Græco-Roman style, of which the Byzantine and Gothic were the eldest daughters, and the beautiful varieties of the Saracenic in Spain, Egypt, Syria, Persia, and Hindostan, the grand-daughters, and which is susceptible of equal refinement with the Byzantine, and equal sculptural and pictorial glory with any style. He cannot, I think, be far wrong in suggesting for the future cathedral the style of the purest days of Christianity, probably long before the time of Constantine the Great,—the style of the early Christian basilicas and churches in Rome, when their arrangements were purely Protestant; and of the first Christian temples of Antioch, Alexandria, Jerusalem, and Constantinople, and which is certainly nearest to the style of Herod's Temple and contemporary synagogues, wherein the Divine founder of Christianity frequently taught; which it is more than probable partook largely of Roman character.

The Classic style is unquestionably the prevailing style in Liverpool.

I cordially agree with Canon Venables that in the Liverpool Cathedral there should be no playing at long choirs, banishing the altar far away from the sight and hearing of the people; and also in what he quotes from Mr. Beresford Hope, "that it should realise the spirit of the age, the wants of the special town, and the requirements of our National Church, and be the true *Ecclesia*, or House of Assembly of Christians of the city and diocese"; conditions which may be fulfilled consistently with,—nay, involve,—the highest architectural beauty and grandeur.

SAMUEL HUGGINS.

SUBSIDENCE OF LAND AT DENMARK HILL, CAMBERWELL.

A GRADUAL subsidence of land has taken place on the Champion Park side of Denmark-hill Station. Some eight or ten years back (says the *South London Press*) the embankment contiguous to Champion Park presented a uniform slope, and attracted the attention of the passengers from the care and cultivation which had been bestowed upon the land. From time to time, however, and almost imperceptibly, slight subsidences occurred, and temporary remedies were introduced for the purpose of preventing more serious encroachments. These appear to have been ineffectual; for within the last month or so a very perceptible alteration has taken place in the appearance of the embankment. The clay beneath has slipped away and the consequence has been that ruts and fissures mark the surface which it formerly supported.

At the meeting of the Camberwell Vestry on the 7th inst., the General Purposes Committee reported that they had taken into consideration a report from the surveyor as to the subsidence of the footpath in Champion Park, and that he had been in communication with Mr. Banister, the company's engineer, on the subject. It was thereupon agreed that the Vestry Clerk should be directed to serve notice on the company, informing them that the subsidence of the footpath and the road required immediate attention, and that they should direct their engineer to take immediate measures to secure the public safety. Consequent on this resolution, active steps have been taken to prevent a further subsidence. Workmen have been engaged in removing the clay, and putting in chalk in its place. By this means a firmer support will be obtained, and the ground, it is anticipated, will be more effectually drained. At the De Crespigny-terrace end, where the results of the subsidence are less perceptible, the wall is being protected by large bolsters of wood.

At the meeting of the Vestry on the 21st inst., the General Purposes Committee reported that the surveyor had directed the attention of the committee to the fact of a further subsidence that had taken place on the public pathway in Champion Park, next to the railings of the London, Brighton, and South Coast Railway, adjacent to Denmark-hill Station, which required immediate attention, and recommended that the Vestry Clerk be authorised to take such proceedings, by mandamus or otherwise, as he might be advised, to compel the company to adopt effective measures to make the path and road safe and secure for the protection of the inhabitants and the public. The recommendation was adopted.

PROGRESS OF THE INSTITUTION OF CIVIL ENGINEERS.

AT the annual general meeting held on the 20th inst. the report read showed that during the past year there had been an increase of fifty-two members, 119 associate members, and forty-nine students, with a decrease of sixteen associates, while the honorary members remained the same. There were on the books on the 30th of November last, eighteen honorary members, 1,261 members, 1,406 associate members, 552 associates, and 662 students; together, 3,899. At the same date in 1860, the number of members of all classes was exactly 1,000. The student class had only been created fourteen years. In the interval, 1,462 candidates had been admitted, of whom 400 had since been elected into the Corporation, and 400 had ceased to belong to the Institution and in most instances to the profession. The deceases had been at the rate of nearly 19 per 1,000, and had included several very old members, notably Mr. James Ashwell, the survivor of the five founders of the Institution.

The income last year was 12,398*l.* 11s. 5d., besides which the receipts had included 3,076*l.* 14s. on account of admission fees and life compositions (which were rigidly treated as capital, and were not used for defraying ordinary expenses), and 431*l.* 5s. 6d. from dividends on trust funds. The general expenditure had amounted to 12,092*l.* 7s. 11d., including 6,523*l.* 17s. 8d. for four volumes of Minutes of Proceedings and for the subject-matter index. A sum of 3,000*l.* had been invested, and 390*l.* 0s. 1d. had been expended for premiums and prizes under trust. The cash balance in hand was 771*l.* 12s. 1d., being 424*l.* 2s. 11d. above what it was at the same period in 1880. The income had been nearly 4 per cent., and the total receipts 6 per cent., in excess of the previous year.

The nominal or par value of the investments held under trust was 14,612*l.* 13s. 10d., and of those belonging absolutely to the Corporation 36,838*l.* 11s. 8d., the dividends on the latter having contributed 1,433*l.* 17s. 6d. to the income. It was stated that on the 30th of November, 1867, the Institution investments (irrespective of trust moneys) were of the nominal value of 17,133*l.* 1s. 3d.; that in the next two years 18,120*l.* 2s. 4d. had been paid for rebuilding and furnishing the enlarged premises, without the necessity for calling upon individual members for special subscriptions; and that the present capital had been the growth of little more than twelve years.

SANITARY PROGRESS AT HENLEY-ON-THAMES.

THREE years ago the inhabitants of this picturesque riverside town were roused out of their usually quiet state by a resolution passed by the Local Board of Health in favour of constructing waterworks to give the town a supply of pure water. This meant an expenditure of 10,000*l.*, and was considered a needless and extravagant waste of public money by many of the principal owners and ratepayers, and an agitation was begun which resulted in many of the members of the Board who had advocated waterworks being turned off the Board, and others opposed to it taking their place. The present supply is drawn from wells, the drainage being into cesspools, in many instances so near the wells as to make it at least possible for the water to be contaminated. After the failure of the authorities to carry out their scheme, a company was formed, and a scheme prepared by Mr. Jabez Church, C.E., of Westminster. The shares were well taken up, and contracts entered into for carrying out the works, Messrs. Docwra & Sons being entrusted with the construction of the reservoir; Mr. Charles Clements, of Henley, with the buildings at the pumping-station; and Messrs. Young & Co., of Pimlico, with the engineering work, including the laying of mains. The water will be softened and filtered by Atkins's process, carried out by the Water Reform Company, Fleet-street. The works are nearing completion, and it is hoped that water may be supplied in about two months.

It has lately been thought necessary that the surveyor and sanitary inspector should devote the whole of his time to carrying out the duties of the offices, and, with a view to this desirable purpose, Mr. H. Malcomson (late surveyor of Lichfield), has been appointed.

The Local Board has lately undertaken to do all the scavenging and cleansing of cesspools in the district, thus hoping to avoid carrying out a system of drainage. A memorial, however, having been sent to the Local Government Board, complaining of the want of such a system, Capt. Hildyard, one of the inspectors, came down to hold an inquiry, and to inspect the town. At a meeting of the Local Board last week, a copy of his report was read, in which he strongly condemned the present arrangement of draining into cesspools, and he also stated that it would be impossible to allow the slop water from the lower part of the town to continue flowing into the Thames.

The Local Government Board has given the authorities six months to prepare a scheme, and it is hoped that there will be no attempt to shirk this important matter, but that efforts will be made to render the drainage of this much-frequented summer resort of visitors perfect, and it will doubtless add to its popularity as a residential place.

CRYSTAL PALACE SCHOOL OF ENGINEERING.

The certificates gained by the students of the Crystal Palace School of Practical Engineering were distributed in the lecture-room at the palace on the 17th inst., by Sir John Coode, of the Council of the Institution of Civil Engineers. Prior to the distribution, Mr. F. K. J. Shenton, superintendent of the Crystal Palace School of Art, Science, and Literature, read the report of the examiners,—Mr. F. Wentworth-Shields, M.I.C.E, and Mr. Joseph Fogerty, M.I.C.E.,—both of whom congratulated Mr. J. W. Wilson, the vice-principal; Mr. J. W. Wilson, jun., and their assistants, on the excellent work done in the school.

Sir John Coode, in the course of his address, observed that anything more satisfactory than the report of the examiners could not be conceived. Forty years ago, when he himself was preparing for the noble profession to which so many of them aspired, there was not a single institution in the country which could for a moment claim to take rank with their school. The want being greatly felt, a college for educating civil engineers was formed at Putney, but it unfortunately had only a very short existence. He mentioned this in order to impress on them as strongly as he could the advantages which they enjoyed. He had been particularly struck with the very happy combination of technical instruction with practical training which this school offered to the young man who desired to join the profession of the civil engineer, or, indeed, of the mechanical engineer.

Major Flood Page, manager of the Crystal Palace, moved a vote of thanks to the examiners, and expressed the gratitude of his directors to the distinguished members of the engineering profession who had been ever ready since the school was formed to render their services as examiners, and to tell them candidly what they thought of the institution. The vote was passed with acclamation.

Mr. J. W. Wilson, jun., afterwards stated that nearly two-thirds of the students who had left the school were in good positions.

IMPROVEMENT OF GRATES.

In a lecture on the Economy of Fuel for domestic purposes, delivered at South Kensington in connexion with the Smoke Prevention Exhibition, Mr. Thos. Fletcher, F.C.S., said:—

It is well known that all metals are good conductors and bad radiators of heat. Any metal in contact with burning fuel lowers the temperature by conducting the heat away, and our first care must be as far as possible to encase our fires with a non-conductor, such as fire-clay. If economy of fuel is any consideration, no metal must come into contact with it unless absolutely necessary. It is or was the fashion to put iron backs, sides, grates, and bars to open fires, the result being dirt, smoke, cinders, and great waste of fuel. Thousands of people who have these extravagant grates, knowing they are extravagant, go on from year to year because they object to the cost and mess of replacing them in houses which may be left at any time, the certain outlay being greater than the probable economy. I will try to explain to you how you can, with very little trouble or expense, convert these extravagant grates into the most modern and approved forms. The result will be, if my own experience is any guide, a saving of at least one-third the fuel, and more than half the dirt and trouble. There is only one fairly good non-conductor of heat known at present which can be applied to grates,—that is, ordinary fire-clay. If we use this to line a grate, the result is, if not fitted and then burnt in a kiln, it simply cracks away and falls to powder when the fire is lighted, and here is the point to which I wish to call your special attention. If you take ordinary builder's fire-clay, and mix it, not with water, but with a solution of silicate of soda, you can build, shape, or patch your fire-linings to any extent, without risk of breakage or falling to pieces. If you get cracks you can repair them perfectly with the same material, and you can also repair broken or damaged fire-clay linings already in use, provided the surfaces you wish to join or build to are clean and damp, to ensure perfect adhesion. You will of course understand that loose fire-bricks or balls are an unnecessary nuisance, as you can reduce or alter your fire-grates neatly and well by this material, using, if necessary, lumps of broken brick to fill up any large spaces, and plastering over these, making a neat finish of the whole. Silicate of soda, or soluble glass, is not exactly what soap is made from, but it is used to an enormous extent for the adulteration of soap, and can be obtained easily at a very small cost. We pay for it at the soap-works at about 1s. 3d. per gallon. One most important point is, that the iron bars under the fire shall not only be closed by building up underneath the fire-grate with bricks, but the mixture I refer to must be laid on the upper side of these bars until it is about ½ in. to 1 in. thick, so as totally to prevent contact of the metal with the burning fuel. The front bars of the fire must be left alone; it is not possible to interfere with these without spoiling the appearance of the fire. When we get a solid fire-clay bottom, back, and sides to a fire, we get a much higher temperature, because the heat is not conducted away by the metal; we get no cinders, and our fire, burning, as it does, principally on the surface, is both brighter, hotter, and much more free from smoke. It will be found, also, that the fuel consumption is very much reduced, and the fire burns much longer without attention."

THE REMOVAL OF MATERIALS FROM BUILDINGS ON WHICH MONEY HAS BEEN LENT.

Sir,—From my experience last week it would appear that thieves need no longer fear the police or run the risk of a prison. I have a man in charge of some unfinished cottages at Edmonton which had been abandoned by the builders, and on which property I have lent money. I have an equitable mortgage and deposit of the building agreement, in which latter it is covenanted that no materials shall be removed without my written consent. The man in charge wired me the other day that a number of roughs had arrived, and were loading a van with materials from the buildings, purporting to be acting under a bill of sale.* I replied that he was to lock up any person stealing the materials, and detain the goods; but the police refused to take the charge or in any way to interfere, and so the materials disappeared and some portion of my security vanished under the eyes of the police.

What an opportunity for the thieves of London to get up bills of sale and plunder in broad daylight every carcass in the suburbs, under the eye, if not under the protection, of the police! In like manner a builder, to whom I had also advanced money, failed to complete his work at Wandsworth, and I had unfortunately to enter into possession, three months ago, under my powers contained in the building agreement. In November I entered into a contract with another builder to finish the property for me for a certain sum of money, and while he and his men were at work, a few days ago, there came upon the scene about a dozen roughs and a policeman, and forthwith a quantity of materials were forcibly taken away. It transpired that a mason who, four months ago, was employed by the original builder, sold, or pretended to sell, the materials taken away to a neighbouring publican, and, after flourishing a receipt, I was left minus the materials, the police looking on and refusing in any way to interfere.

The contractor who is responsible to me for the goods applied to Mr. Partridge on Saturday, but that gentleman simply called it a dispute of title, and referred the contractor to a superior court.

I wonder if the mason had sold Mr. Partridge's sideboard to a publican, and the roughs had dealt with it as they did with my materials, whether he would have considered it a dispute of title or sent the parties to prison?

The fact of refusing to interfere under a criminal charge in such cases opens the door to a flood of crime. The whole scum of London may now proceed to sell materials which do not belong to them, carry off the spoil, and dispose of it without fear or hindrance.

I do not complain of any man urging a claim or disputing my claim; but, with all respect to the learned magistrate and the police, I consider it a crime for a band of men to enter (trespass upon) my premises, and forcibly remove materials without my knowledge and consent, and dispose of the same before establishing a claim to them. It is no question of title, for that can and ought to be settled without a removal of goods. It is a question of crime or no crime, and if I am correct in calling it crime, then it is for the police and the magistrate to deal with it; if no crime, then it is a millennium for some of the denizens of Seven Dials.

W. G.

* A search has been made for the registration, but without result.

WANT OF A RAILWAY, EAST DULWICH.

At a public meeting held recently in East Dulwich, a resolution to the effect that a new railway was required giving additional accommodation for that district, was proposed and warmly supported by several speakers; amongst others by Mr. Mercer, who said that ten years ago there was little to be seen but green fields, and other indications of rural life. Since that time something like 4,800 houses had been built, but he was sorry to say that 40 per cent. of them were unoccupied at the present time, and it was simply because people were not afforded means of getting to and from the City quickly. Another speaker (Mr. J. Ball) said that within the last two days he had counted the number of empty houses in the three main thoroughfares of the district, viz., Lordship-lane, Crystal Palace-road, and Barry-road. In Lordship-lane, from Goose-green to Barry-road, he found 159 houses or shops occupied, 72 unoccupied, and 19 in process of building. In Barry-road, 107 were occupied, 44 unoccupied, and 12 were unfinished. In Crystal Palace-road, 215 of the houses were occupied, 105 unoccupied, and 9 were in an unfinished condition. The number of unoccupied houses amounted to about 30 per cent. of the whole. The resolution was unanimously adopted, as was also another resolution appointing a committee to wait upon the representatives of the two railway companies in reference to the construction of the proposed new line.

CURIOUS EFFECT OF A STORM.

A curious effect of the last equinoctial gales is reported from Griesheim, in Germany. A chimney had just been finished at the Chemical Works at that place when the storm came on. The total height of the chimney was 40 mètres. The upper 32 mètres above the socle were divided into four parts, which were respectively two bricks and a half, two, one and a half, and one brick in thickness, the mortar being of ordinary lime and sand. The violent wind which came on immediately after the bricklayers had finished had the effect of bending the chimney fully a yard out of the vertical line. But it did more than this, it twisted the upper portion of the chimney perceptibly round its axis out of its original position. The deviation from the vertical line begins a little above the socle, and then increases in a slight curve up to the top, which, as above stated, is fully a yard out of the perpendicular or axial line. The materials used were of very excellent quality, nor was there anything in the method of construction to account for the strange effect visible after the storm. It is clear that the mortar was not dry, and was, therefore, incapable of resisting the effect of the unusual violence of the wind.

FUNERAL OF MR. G. E. STREET, R.A.

On Thursday last, the 29th, the remains of the late George Edmund Street, R.A., P.R.I.B.A., F.S.A., &c., were interred with all due solemnity in the nave of Westminster Abbey. The procession started from the residence of the deceased, 14, Cavendish-place, Cavendish-square, about two o'clock, in the order hereunder mentioned:—

The funeral car carrying the body.

Seven mourning coaches, containing the members of the deceased's family, including Mr. Arthur Edmund Street, M.A., A.R.I.B.A, son; a brother and sister of the deceased; Mr. Wells, R.A., and a number of other private friends; besides several representatives of Mr. Street's office staff, including Messrs. Tanner, Gandy, and Holland.

Four mourning coaches, containing the President and Council of the Royal Academy, viz.:—Sir Frederick Leighton, P.R.A.; and Messrs. Alma Tadema, H. H. Armstead, Vicat Cole, J. E. Hodgson, F. R. Pickersgill (Keeper), and other members and officers of the Academy, including Mr. Fred. A. Eaton, Secretary.

Nine mourning coaches, containing the Past Presidents, Past Vice-Presidents, the Vice-Presidents, Members of Council and other officers, Honorary Associates, and other members of the Royal Institute of British Architects, viz.,—First coach, Professor Donaldson, P.P.; Mr. Charles Barry, P.P.; and Mr. George Godwin, P.V.P. Second coach: Mr. Horace Jones (the City Architect), V.P.; Mr. Ewan Christian, V.P.; Mr. F. C. Penrose, M.A., P.V.P.; and Mr. David Mocatta, P.V.P. The third, fourth, and fifth coaches contained the Members of Council, in the following order,—Mr. A. W. Blomfield, M.A.; Mr. James Brooks; Mr. David Brandon, F.S.A.; Mr. Arthur Cates; Mr. Joseph Clarke, F.S.A.; Mr. John Gibson; Mr. Henry Currey; Mr. Octavius Hansard; Mr. J. T. Knowles; Mr. Alfred Waterhouse, A.R.A.; Mr. E. G. Paley; and Mr. Thomas Worthington. In the sixth coach were Mr. J. Macvicar Anderson, honorary secretary; Mr. William H. White, secretary; Col. Sir Andrew Clarke, R.E., C.B., K.C.M.G. (representing the Royal Engineers); and the Right Hon. W. H. Smith, M.P. (Hon. Associate). In the seventh coach were Sir Philip Cunliffe Owen, C.B.; Mr. P. C. Hardwick, F.S.A.; M. le Professeur Émil Trélat, of La Société des Ingénieurs Civils, Paris (Hon. and Corr. Member); and Mr. James Abernethy, Past President of the Institution of Civil Engineers (Hon. Associate). The eighth coach contained Mr. G. J. Symons, F.R.S., President of the Meteorological Society; Mr. C. L. Eastlake (Keeper of the National Gallery); Mr. Joseph Goddard, President of the Leicestershire Society of Architects; and Mr. John P. Seddon (representing the Royal Architectural Museum). The occupants of the ninth coach were Mr. T. M. Rickman, F.S.A. (Auditor); Mr. J. Tillman, President of the Northern Architectural Association; and Mr. J. Wreghitt Connon (representing the Leeds Architectural Society.)

One mourning coach, containing representatives of the Council of the Society of Antiquaries.

One mourning-coach, containing the following representatives of the Architectural Association, viz., Mr. Aston Webb, President; Messrs. Frederick E. Eales and W. H. Atkin Berry, honorary secretaries; and Mr. J. Douglass Mathews, treasurer.

The carriage of H.R.H. the Prince of Wales, and several private carriages, brought up the rear of the procession, which took the following route:—Regent-street, Waterloo-place, Pall Mall, Cockspur-street, Whitehall, Parliament-street, Broad Sanctuary, and Dean's Yard, to the west cloisters gate, arriving at 2·50, whence the procession entered the Abbey, preceded by the choristers and clergy of the Abbey. The latter included the Very Rev. the Dean (Dr. Bradley); Canons Farrar, Duckworth, Barry, and Rowsell; and Minor-Canons Troutbeck, Price, and Cneadle.

The pall-bearers were:—The Right Hon. A. J. B. Beresford-Hope, M.P., Past-President of the Royal Institute of British Architects (representing also the Royal Architectural Museum); Sir Frederick Leighton, P.R.A.; the Right Hon. G. J. Shaw-Lefevre, M.P., First Commissioner of Works; Mr. W. H. Gladstone, M.P. (representing his father, the Prime Minister); Mr. E. Freshfield (representing the Society of Antiquaries); Professor T. Hayter Lewis, F.S.A., Senior Vice-President of the Institute; the Right Rev. the Bishop of Winchester; and the Hon. Mr. Justice Kay (representing the Lord Chancellor).

The mourners entered the Abbey in the order in which they proceeded from Cavendish-square, followed by representatives of the general body of the Royal Academicians, Associate-Academicians, and officers of the Academy; of the general body of the Fellows, Associates, and Honorary Associates of the Royal Institute of British Architects; of the general body of the Fellows of the Society of Antiquaries; and of the general body of the members of the Architectural Association. Also represented at the funeral were clerks of works, builders, and carvers who had worked under Mr. Street, including Mr. W. T. Creed (clerk of works), Mr. Wallis (clerk of works at the Royal Courts of Justice), and Mr. H. G. Margetson (carver at the Courts of Justice).

The service was full choral. The grave is in the nave, just by the pulpit, and close to the graves of Sir Charles Barry and Sir Gilbert Scott.

Besides the gentlemen whom we have already named as attending the funeral, we noticed Messrs. J. C. Horsley, R.A.; J. E. Millais, R.A.; W. Calder Marshall, R.A.; W. Q. Orchardson, R.A.; W. W. Ouless, R.A.; J. R. Herbert, R.A.; P. H. Calderon, R.A.; H. S. Marks, R.A.; T. O. Barlow, R.A.; Alfred Waterhouse, A.R.A.; E. Long, A.R.A., J. E. Boehm, A.R.A.; Marcus Stone, A.R.A.; J. McWhirter, A.R.A.; G. Aitchison, A.R.A.; R. Phené Spiers, Master of the Architectural School at the Royal Academy; Hugh Stannus; Professor Kerr; Professor T. Roger Smith; Messrs. E. Woodthorpe; W. White, F.S.A.; Bowes A. Paice; James Fergusson, F.R.S.; George Vulliamy; John Hebb; E. R. Robson, F.S.A.; E. C. Robins, F.S.A.; T. W. Cutler; E. I'Anson; F. H. A. Hardcastle; Hampden W. Pratt; H. Jarvis, jun.; Cole A. Adams; H. Lovegrove; Thomas Hawksley, M. Inst. C.E.; R. W. Edis, F.S.A.; C. F. Hayward, F.S.A.; Mr. R. L. Cox; and Sir Henry Cole, C.B. We were also informed that the following gentlemen were among many old assistants and pupils of Mr. Street who came from near and far to the funeral, viz., Mr. G. D. Oliver (Carlisle), Mr. H. G. W. Drinkwater (Oxford), Mr. W. Wood Bethell, Mr. James Bell, Mr. T. E. Collcutt, and Mr. Sidney Vacher.

No doubt many names are omitted in the foregoing account, which is, however, as perfect as it could be made in the two or three hours which intervened between the conclusion of the funeral ceremony and the time of our going to press.

The funeral arrangements were in the hands of Messrs. Holland & Son, of Mount-street, Grosvenor-square.

The Government has confided the completion of the Courts of Justice to the two gentlemen who have been Mr. Street's chief assistants in the work. This took place some little time before his death, but it was thought the mention of it might have affected him, and we, therefore, avoided doing so.——In our notice last week we mentioned as Mr. Street's executor a brother Royal Academician. This is not correct; Mr. Arthur Edmund Street is left sole executor of his father's will.

THE "ELECTRIC" PAINT REMOVER.

WE have had an opportunity of seeing some experiments with the new patent "Electric" Paint Remover lately introduced into the market by the patentees and manufacturers, Messrs. Rendle Bros., of Westminster-chambers, who, already well known (in conjunction with their father, the late Mr. W. Edgcumbe Rendle) for their admirable method of glazing roofs without putty, are likely to become as well known for the valuable material which is named at the head of this article. Before describing it and its method of application, we should perhaps note that the material is chemical, and not electrical, in its action, the title "Electric" being adopted by the patentees as expressive of the rapidity of action which is one of its chief characteristics. Although the results obtained by its use are not obtained with the rapidity of lightning, the celerity with which the "Paint Remover" does the work it professes to do, and does it effectually, is very striking. As to the composition of the material, its principal ingredient, we understand, is chemically pure soda, with other ingredients, all of which are stated to be non-injurious to the wood or other material from which the paint is to be removed. One ingredient common to most paint-removers, viz., lime, is totally absent. The material, which is in the form of a white creamy paste of equal consistency, is sold in tins, and it has the recommendation of being very cheap. It is easily applied, possesses no offensive smell, contains no grit, and is not injurious (as we are informed) to the hands of the workmen using it, nor does it injure the material operated upon. It is equally efficacious for the removal of old paint, varnish, tar, rust (where not eaten into the metal), grease, japan, &c., from wood, stone, iron, marble, &c. Another application of it is for the rapid removal of wall-papers, a pint of the "Remover" being mixed with a pailful of water, and the mixture laid on the paper to be removed with a plastering brush. By the time the workman has made the circuit of a small room in this way, he will be able to quickly wash off the paper, beginning, of course, where he commenced with his brush. To remove paint, japan, &c., a thick coating of the "Remover" is spread with a palette-knife or trowel on the surface to be operated upon, and allowed to remain for about half an hour. The *rationale* of its action is that the strong alkali of the compound, acting upon the oil contained in the paint, induces saponification, rapidly forming a kind of soapy paste in which the ingredients of the paint are taken up, and when this process is completed (a matter which is easily ascertained by the removal, with a knife or other tool, of a portion of the layer of "Remover," or by its change in colour, as it loses its whiteness in proportion as it absorbs the pigments in the paint), the work operated upon can be held under a water tap, or subjected to the action of a jet of water, or washed with a flannel and water. The newer the paint, and the fewer the coats of it which have to be removed, the quicker, of course, is the action of the "Remover," one application of which will be found to be sufficient for all ordinary work. Among the specimens which we saw operated upon were pieces of painted wood and parts of japanned gas-meter-cases, and each experiment was perfectly successful, fully bearing out the claims made on behalf of the "Paint Remover."

We have stated that the material will clean stonework. This it will do, whether the stonework be covered with paint or discoloured by soot or grease. Talking of grease, we call to mind a notable instance of the defacement of a building by that kind of "matter in the wrong place," viz., the Portland stone surbase on the exterior of the Metropolitan Meat Market at Smithfield. This is disfigured by being overlaid with a veritable "dado" of grease made quite black by dirt. The cause of this eyesore is that the butchers and market-porters, in the intervals of carcass-carrying, loll, pipe in mouth, and, of course, with their greasy "overalls" on, against Mr. Horace Jones's architecture. The Corporation of London will, we think, do well to allow Messrs. Rendle to try their new material on this greasy dado, which, however much it may tend to preserve the stone, is a great disfigurement to the building.

Messrs. Rendle prepare a special solution of their material, prepared expressly for cleansing very delicate carved work, and for use in the cleaning and restoration of textile fabrics.

We have said enough to show the remarkable properties of this material, which we have no doubt has a good future before it.

PROPOSED NEW WORKHOUSE FOR ST. PANCRAS.

THE Guardians of the above parish, after nominating the following architects, — viz., Messrs. Aldwinckle, Young & Hall, Hoole, Bridgman, Saville & Son, Isaacs & Florence, Verity, Norman Shaw, Seddon, Quilter, Giles & Gough, Wadron, and Gundry,—have selected the first five on the list to send in competitive plans for the new workhouse, which, it is estimated, will cost from 150,000*l.* to 200,000*l.* 300*l.* are to be equally divided between the four unsuccessful candidates; the successful one will be paid the ordinary commission on the outlay. Upon counting the votes, it was found that Messrs. Saville & Son, of 1, Argyle-square, and Messrs. Isaacs & Florence were seven each; this being so, a second voting took place, and the result was:—Saville & Son, 13; and Isaacs & Florence, 4.

THE PUBLIC SAFETY IN THEATRES.

At the meeting of the Metropolitan Board of Works on the 23rd inst., the Building Act Committee recommended that the Superintending Architect be authorised to have a translation made of the Berlin and Hamburg Theatre Regulations, and that he be instructed to obtain, if possible, a copy of the new regulations issued by the municipal authorities of Vienna, and have a translation thereof made, and that the translations be printed and circulated amongst the members of the Board. The recommendation was agreed to. The committee also reported that after the inquiry relative to the inspection of the Royal Comedy Theatre, Panton-street, and the Avenue Theatre, Northumberland-avenue, they regretted that the examination of the latter theatre had not been more carefully made, and under more favourable circumstances. A discussion of a personal character followed, in which the interference of the District Surveyor by a letter addressed to the Superintending Architect was condemned on one side and defended on the other. The report of the committee was adopted.

We have received a number of letters on the subject of these two theatres, and of the differences which have grown up between the District Surveyor and the Superintending Architect of the Board in connexion with them; but they deal so freely with persons that we have avoided discussing them. If the public safety, however, be at stake, it must of course be done.

At a meeting of the dramatic critics of the principal London newspapers, the following resolutions were passed: — 1. That the condition of many of the London theatres, both in regard to the stage and the auditory, in case of fire and panic, is extremely unsatisfactory and unsafe. 2. That the time has come for amending the laws that apply to theatres and places of amusement generally in the United Kingdom; and that it is highly necessary to appoint a Government official, to be held publicly responsible for the safety of theatres and places of amusement, and to be assisted by qualified inspectors. 3. That, pending the introduction of new legislative measures, and for the immediate protection of the public, the control, as regards danger from fire, of all theatres and places of amusement should be placed under the direction of the official chief of the Metropolitan Fire Brigade and his subordinates. 4. That the Lord Chamberlain be invited to assist, as far as lies in his power, in the prevention of danger from fire, or alarm of fire, in theatres.

Mr. C. J. Phipps, F.S.A., has, at the request of Mr. Michael Gunn, made an examination of the Gaiety Theatre, Dublin, with especial regard to facilities for safe egress in case of panic. He finds that the supplies of gas to the corridors and staircases are quite distinct and taken from an entirely different main from that supplying the stage. Each division of the audience has its own entrance and way out, and the various attendants and officials are charged with the duty of opening all doors, &c., under their control directly the exit of the audience is impending. All internal doors and barriers open outwards, and external doors are locked back while the audience is in the theatre. There are high-pressure mains on the stage, in front and in the flies, with a fireman of the Brigade always in attendance while the audience is in the theatre. On the most crowded nights the audience is out of the theatre in four minutes, so that, Mr. Phipps says, "the danger is not from fire, but from a mad stampede." Ay; but how to prevent danger from *this* cause?

The Safety of Churches.—Very little time has been needed to produce cases in confirmation of the truth of the observations we made last week touching the necessity for attention to the modes of exit provided in churches as well as in theatres. On Christmas-day at Warsaw, in the Church of the Holy Cross, a false alarm of fire was given by some evil-disposed person. A general panic ensued, the worshippers making a mad rush to the doors. Some thirty or forty persons were crushed or trampled to death, and about sixty others were more or less injured. Again, on Boxing-day the floor of the Methodist chapel at Camborne, near Plymouth, laden with goods for a bazaar, gave way and produced a frightful panic and serious injuries to many persons.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,379. J. C. Baker, Liverpool. Ventilating buildings, &c. Dec. 9, 1881.

5,381. D. Gill, Weston-super-Mare. Water-closet apparatus, &c. Dec. 9, 1881.

5,391. W. R. Lake, London. Cesspools. (Com. by L. Mouras, Vesoul, France.) Dec. 9, 1881.

5,397. W. Whitwell, Stockton-on-Tees. Apparatus for heating air, &c. Dec. 9, 1881.

5,419. G. H. Chubb, London, and H. W. Chubb, Chislehurst. Locks. Dec. 10, 1881.

5,424. E. A. Rippingille, Aston-juxta-Birmingham. Gas stove. Dec. 12, 1881.

5,439. W. E. Burder, Loughborough. Boilers for hot-water apparatus. Dec. 13, 1881.

5,466. W. Bash, J. Bash, and N. S. Dansa, Manchester. Locks and latches. Dec. 14, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

Dec. 13, 1881.

3,451. E. Lee, Torquay, and A. C. Moore, Deptford. Regulating the supply of water to water-closets, &c. Aug. 9, 1881.

3,535. J. C. Johnson, Gravesend. Manufacture of Portland and other cements. Aug. 15, 1881.

3,862. J. Dunnachie, Glenboig. Regenerative kilns for burning fire-bricks, &c. Sept. 6, 1881.

4,927. E. de Pass, London. Manufacturing artificial stone. (Com. by R. H. Stone, Brighton, Victoria.) Nov. 10, 1881.

Dec. 16, 1881.

3,507. E. G. Brewer, London. Plastering. (Com. by D. W. Stockstill, T. J. McGeary, and E. W. Anderson, Washington, U.S.A.) Aug. 2, 1881.

3,512. T. Redmayne, Sheffield. Stoves and fireplaces. Aug. 12, 1881.

3,523. W. Brierley, Halifax. Venetian blinds. (Com. by F. Rüler, Teplitz, Austria.) Aug. 13, 1881.

4,678. S. Leoni, London. Apparatus for heating, cooking, &c., by gas. Oct. 26, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending December 17, 1881.

1,981. G. Giles, Birmingham. Cornice-poles.

A tubular pole is open-jointed on the underside, and has within it another pole on which is a right and left handed screw. On the inner pole are the rings for the curtains, each of which has a tooth working in the screw. On the end of the pole is a toothed roller end, which is actuated by a cord, and makes the pole revolve, taking backwards and forwards the curtain rings. May 7, 1881. Price 4d.

1,983. C. J. Pollard, Burnley. Stoves and fire-ranges.

A chamber, in the sides of which are air-passages, is placed in the centre of the stove or range, and fitted with a damper to regulate the supply of air admitted to the fire. (*Pro. Pro.*) May 7, 1881. Price 2d.

2,000. E. Edwards, London. Wrought-iron window-frames.

The frames and cross-pieces of the windows are made of iron of hollow square cross-section and a bed of non-conducting material is arranged between the parts to prevent cold air entering the room. (Com. by C. A. Schütz, Stralsund.) May 9, 1881. Price 6d.

2,021. E. V. Harris, Winchester. Sliding window-sashes.

The sash-tiles are divided, and to the side portions that slide in the grooves of the window-frames the sash is pivoted, so that it may be swung over for cleaning, &c. (*Pro. Pro.*) May 9, 1881. Price 2d.

2,037. H. J. Haddan, Westminster. Apparatus for drying, roasting, &c.

The oven and flues are formed of brickwork. A screw-conveyor and its casing, which are of metal, are placed over the oven. The fireplace is at the side of the oven, all round which the flues extend. (Com. by E. H. Potter, New York, U.S.A. (*Pro. Pro.*) May 10, 1881. Price 2d.

2,040. P. Jensen, London. Artificial stones or compositions.

Pulverised asbestor is mixed with a silicious solution of 25° to 50° Baumé, metallic oxides, and chalk, plaster of Paris, lime or clay. In the thicker states this forms an artificial stone, and in the thinner states a paint or cement (Com. by E. J. Erichsen, Copenhagen.) 10th May, 1881. Price 4d.

2,044. W. Clapham, Leeds. Fire-grates.

The bottom gratings of these grates have a rising and lowering motion by a rack and pinion, by which motion the size of the fire is increased or reduced. (*Pro. Pro.*) 10th May, 1881. Price 2d.

2,059. A. Guattari, London. Machinery for producing designs upon marble.

The surfaces of the moulds are roughened or covered with fine pyramidal teeth. The moulds are lifted by tappets on a rotary shaft, and allowed to fall upon the block to be carved. Emery powder falls upon the back of the mould, and water being distributed through a rose carries the emery between the roughened surfaces of the mould and the block. (*Pro. Pro.*) 11th May, 1881. Price 2d.

2,060. A. M. Clark, London. Window-cleaning chair.

This chair has a platform, folding guards, supports, steps &c., which can be arranged in either an open or folded condition. It is secured in position by a flat bar adjustably held in position by angle rods that project from each end of the bar up through slots in either side of the platform, where they are held by plates with bevel-edged perforations engaging teeth in the rods. Screws are used to clamp the bar. (Com. by Mrs. A. Dormitzer, New York, U.S.A.). May 11, 1881. Price 6d.

2,087. G. Osborne, Brighton. High-pressure regulating taps or valves.

This is an improvement on Patent 2,994 of 1875, in placing the additional valve near the stem of the ordinary valve on the upper side of the passage of the tap, instead of on the under side, so that it is easier to get at the stem or spindle when required. May 13, 1881. Price 6d.

2,100. A. A. Bedford, Clapham. Locks or fastenings.

The novelty here is that the handle must be pressed inwards before it can be turned, and when it is released a sprig forces the handle out again, so that the door cannot be opened by mistake. (*Pro. Pro.*) May 13, 1881. Price 2d.

2,105. F. C. Jeune, London. Manufacture of ornamental embossed fabrics for covering walls, &c.

Indiarubber is thoroughly cleansed and reduced to dough by a spirit solvent. This dough is mixed with an equal quantity of finely-ground cork, and spread on a cotton fabric. After being dried it is rolled and faced. The embossing is then performed by flat pressure, under a block having the desired pattern, and afterwards the fabric is coloured and varnished. May 13, 1881. Price 2d.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

RESOURCES OF IRELAND.

At the Statistical Society, on the 20th inst., Dr. Balfour in the chair, a paper was read on "The Industrial Resources of Ireland," by Mr. G. Phillips Bevan, D.L., showing that the industrial position of Ireland has been strangely neglected, the attention of statesmen and others having been entirely engrossed with the political side of the question. Great ignorance, moreover, prevails as to what the industrial resources of the country really are. It is very clear that, with a few exceptions, the industries have been declining, as has also the industrial section of the population. There is no industrial point on which there is more misapprehension than about the coal and iron deposits of Ireland, which it is the fashion to ignore, though most unfoundedly. The coal deposits of the Leinster field are estimated to possess 102,580,000 available tons; those of the Munster field, 20 millions; of the Connaught field, 10 millions; of the Ulster field, 18,000,000; total, 182,280,000; and yet, with all these known valuable beds, the collieries of Ireland are in a languishing condition, the annual outputs never exceeding 140,000 tons, and seldom reaching that. While in 1876 the Leinster field alone produced 170,000 tons, the total yield of all Ireland in 1880 was only 133,719. No wonder, then, that the number of collieries is on the decline, as also of coal miners. It is the more unaccountable, as the coals are of excellent quality, both bituminous and anthracite, and the annual consumption of coal in Ireland is now nearly three million tons. Two centuries ago, Ireland possessed a flourishing iron trade, charcoal-smelted; and it has since been proved by competent authorities that the best iron can be made in Ireland as cheaply as in England; and although English and American competition would keep Irish iron out of the markets of the world, there is no reason why a large home demand should not be supplied at home. Cement works have been started in County Fermanagh by Mr. Bloomfield, of Castle Coldwell, and have proved a great boon to the neighbouring country. The Irish building stones, which are of unequalled beauty and goodness, have been greatly overlooked. Probably no country in the world produces finer marble, and yet Bath freestone has actually been imported at vast expense rather than use the stones at hand. The suggestions proposed are,—that an exhaustive examination should be made of every corner of Ireland by a Royal Commission, so as to obtain authoritative information of what the country is capable, and to ascertain why it is, for instance, that collieries are worked to such poor purpose; why an iron trade cannot be started; why woollens should not again be a national industry; why the fisheries should not be made more economically useful, &c. Premiums or bounties

should be offered, as was done with great success on the starting of the linen trade, and is being done in the fisheries, for the development of any new industry, and particularly for the applications of new materials. The lack of communication is a great drawback to Irish prosperity. Cheap light railways should be laid down between the west and north-west coasts and the interior, so that the wilds of Donegal, Mayo, Galway, Clare, and Kerry may be opened up and connected with markets. The rates of existing railway systems should be reduced, and by means such as these, present industries would be created, giving occupation to great numbers of starving people, while industrial energy would follow permanently in their track.

THE DURABILITY OF CALCAREOUS STONE.

SIR,—Referring to Mr. H. Travis's letter of the 3rd inst., and his remarks on the perishable nature of the calcareous stones used in our public buildings, and Mr. Codner's "Notes on our Cathedrals," p. 738, I shall be glad to make a few observations on the durability of calcareous stones, if you will kindly allow me, in your valuable paper. Having had thirty-five years' experience as a stone-carver in most parts of England, Ireland, and France, and for nearly two years taken casts from the old work for the Mediæval Court at the Crystal Palace, I have had rather a large field of observation with regard to the durability of the stones used in our Mediæval architecture.

When engaged on the carving at the west front restoration of Wells Cathedral, I pointed out to my late partner, C. J. Herley, the fact that I had noticed at Beverley Minster, York, Lincoln, Peterborough, Salisbury, &c., but here to a more marked extent, that the faces of the towers looking east and north were in a much higher state of preservation than those looking west and south; in fact, here,—Wells,—at the north-east angle of the north tower, the figure-ornament and mason's work are as sharp as when first cut, though they have been here about 700 years; the clawtool marks are quite plain. The stone is a fine limestone, an oolite, impregnated with a metallic oxide from Doulting, near Shepton Mallet, while that of York, Beverley, and Lincoln is a magnesian limestone from Bramham Moor, Tadcaster. The Percy shrine, Beverley Minster, one of the finest monuments of the Decorated period in England, is in Tadcaster stone, and is as sharp as when first done, though erected in the reign of Edward I. The same observation may be made with regard to our Portland stone buildings of London, Dublin, &c. Notice St. Paul's Cathedral on the north side,—Grinling Gibbons's carved panels are as good as ever; the same at Somerset House, the "Strand" north front,—those keystone heads, "the river gods of England," by Bacon, are as sharp as ever, only black, while the river front looking south is more decayed.

All this proves that it is not the cold frost or smoke that decays the stone, but the wet, as our south-west winds, giving us the benefit of the gulf-stream, are always more charged with moisture; and that if these calcareous stones can be kept dry, they will stand for an indefinite period. The question is, how to keep the water from percolating the stone? When erecting some monuments in the Dublin Cemetery, I noticed the clean whiteness of the Portland stones there; some that had been fixed for years surpassing anything I had noticed before, even in that mountainous cemetery of Père la Chaise of smokeless Paris. An unpractised eye might have thought they had been painted, but to paint stone is to spoil it. No, there were the little shells and flints, showing the proper granular surface of the stone. I found it was the practice of the cemetery masons there always to oil their Portland stones with boiled linseed oil; it must be done when the stone is quite dry. A warm summer's day is the best time, and only one coat, as a second would stand on the surface and turn dark; the result is, that the surface bleaches out almost as white as statuary, and the oil that is absorbed by the stone keeps the wet from percolating, and so preserves the stone. No doubt, a good deal of the soot that sticks to the surface is caused by the suction or capillary attraction of the stone; this has been stopped by the oil, is loose, and is washed away by the rain, and the stone kept clean. I have no doubt, if all the Portland and Bath stone buildings of London were treated in this manner, they would stand longer and keep cleaner; and if all the black bronze statues were gilded like King William at Hull, or Prince Albert in Hyde Park, London, they would have a more cheerful appearance than they now have.

C. ABBEY.

EMBLEMS OF THE TRINITY.

SIR,—I have read with great interest Mr. Dobson's recent lecture on "Symbolism," which is given in the *Builder* for December 10th. It may be of interest to your readers to know that there are still existing in England some representations of the "Trinity" which have escaped destruction. I have lately seen the following:—

1. On the slab of an altar-tomb, on the north side of the chancel of the parish church of Cookham, on the Thames, is a small "brass," about 6 in. in diameter, on which is engraved a representation of the Holy Trinity, in precisely the same manner as in the Yorkshire glass. This brass, it appears, was covered over by the base of a small pillar, supporting a "late" canopy, and, being thus hidden, it escaped being torn up, as so many other brasses were, in the troublous times of the sixteenth century.

2. There is a very perfect and well-carved representation of the Trinity in a niche in the west gable of the nave of the church of Creech St. Michael, in Somersetshire, a short distance from Taunton. The carved group appears to be about 3 ft. in height; its great distance from the ground, and the difficulty of getting a ladder to reach it, are, without any doubt, the causes of its preservation to our time.

3. A very curious group of the Trinity still remains *in sitû* in its niche, at the south-west angle of the tower of the church at Comb Martin, in North Devon (near Ilfracombe). This carving is placed at a great height from the ground, and is in an exceedingly difficult position to get at, either from below or from the top of the tower: to this cause (as in the case of Creech St. Michael also) we owe its safety. In these three groups the Eternal Father is represented as "The Ancient of Days" robed in a cope and crowned as a king, holding His Divine Son crucified; the arms of the Father being extended so as to support the cross, whilst the "Paraclete Dove," the Holy Spirit, hovers over the head of the Son, just where the "morse" of the cope is usually seen; the heads of the Three Persons are surrounded by "nimbi," that of the Son being a cruciform one. The Eternal Father in each case is seated on a throne. It was in the fourth century that artists began to represent the mystery of the Trinity as a group of three persons. These Divine Persons are sometimes represented as supporting a triangle. From the twelfth century upwards we see representations of the Trinity, such as those which I have just described. In many monuments of the thirteenth and fourteenth centuries we see symbols of the Trinity, such as three equal circles interlaced, three triangles entwined, and many other ingenious devices of a like nature. I have seen a very beautiful "Trinity" emblem of this kind engraved on a hewn stone, lying covered by brambles, near an early oratory (now in ruins), at Cahir, county Tipperary, Ireland; it is dated from about A.D. 1200. In the fifteenth and sixteenth centuries we often find figures of the Trinity represented as "triune" ones, that is, three human figures having their three visages united as one. This type has often been condemned and reproved by the Councils of the Church, and they have gradually disappeared from use. In the three examples of this subject which I have cited the Son is crowned with thorns, as in the illustration to Mr. Dobson's lecture. So great a similarity of design shows that there must have been a certain "canon" or rule of representation of sacred subjects prevailing amongst all Christian artists from a very early period, of which "canon" we get glimpses in such literary remains as the "Album of Villars de Honicourt," and in the still earlier pages of Theophilus, the "Monk of Mount Athos." The same rule or "canon of art" is followed out up to this day by the painter "deacons" of the Greek church.

MICHAËL J. E. BUCKLEY.

SIR,—It was with very great interest I read Mr. Dobson's paper on "Symbolism," also Mr. Heme's note on the "Emblem of the Trinity at Black Abbey, Kilkenny," and beg to remind him there is one similar to the one he mentions at Muchelney Abbey, Somerset (see the *Builder*, vol. xxxvii., p. 1078). This interesting relic was dug up during the excavations that have been made there, and was, when last I saw it, in the parish church which adjoins the site of the abbey. Unfortunately, the head of the Eternal Father is missing, but both hands remain, and are placed one on each side of the Son, who stands in front of the Father. The Son in this case is represented as a boy without the cross, and the dove is held in his hands in front of the body.

This valuable relic was found in a small chapel on the north side of the abbey church, near a tomb of one of the abbots. On the top of this tomb is the effigy of an abbot in full vestments, his feet resting on a lion. This figure is, strange to say, also headless.

The tomb being fourteenth-century work, and the emblem and tomb being of the same description of stone (not native), in all probability they are of the same date.

The figures are coloured gold, vermilion, and blue.

T. SHELMERDINE.

DEVELOPING SOUTHAMPTON.

SIR,—I have read the able letter of Mr. James Lemon in your publication of the 17th inst., offering some further information on this subject, and, observing a little incorrectness in the same, permit me, as engineer and surveyor to the Corporation, to add a few remarks in correction thereof.

The Corporation have not extended their paving operations with blue bricks directly in lieu of Caithness stone or any other description of paving, or on account of the former being laid at half the cost of the latter, as stated. The question of blue brick *v.* Caithness stone paving has not, to my knowledge, arisen in this borough, there being no difference of opinion as regards the superiority of Caithness stone. The blue brick paving has simply been laid to supply a great public and long-required improvement over the rough gravel foot-walks, principally in the suburban streets, where, as is the case in a great many other towns, it proves a most excellent, durable, and cheap paving. As regards appearance, I think the fact that the Corporation have received thirty memorials from the ratepayers during the last twelve months in favour of an extension of this class of paving proves that there is nothing objectionable under this head. Caithness stone is laid in the main thoroughfare.

Concerning the new roads which have been made up in the district of Portswood not being considered street improvements, they are not referred to as such in your article of the 3rd; but, under the well-known clause, section 150, of the Public Health Act, they can be classified as street improvements.

W. B. G. BENNETT, Assoc. M.I.C.E.,
Borough Surveyor.

ARCHITECTS' CERTIFICATES.

IN THE COURT OF APPEAL.—GOODMAN *v.* LAYBORN.

ON December 12, this appeal came on for hearing from the judgment of Mr. Justice Lindley and Mr. Justice Grove, who directed that a certain document was a certificate of an architect, and therefore that the amount stated therein was due to the builder for extras, though no written orders had been given to him for them. The document in question was endorsed "Estimate of extras and deductions," &c., and it contained a number of items and prices, being respectively extras and deductions, and the sum of 125*l.* came out as due to the plaintiff. At the foot the architect had written opposite this sum, "Balance due as in conditions, 125*l.*," and lower down had signed it "W. G. Osborne, architect, Ramsgate." Mr. Woolf appeared for the defendant, the building owner, the appellant; Mr. E. S. Roscoe for the plaintiff, the builder, the respondent. The Court held that, looking to all the circumstances of the case, and to the form of the document itself, this was not a certificate. If it had been, it would have done away with the want of written orders for extras, but as they could not hold it to be a certificate within the meaning of the contract, the absence of written orders was fatal to the validity of the plaintiff's claim. [When will architects and builders learn that the terms of contracts are meant to be observed, and are not mere surplusage?]

BITTESWELL CHURCH, LEICESTERSHIRE.

The restoration and additions to Bitteswell Church were commenced early in last autumn; the old church having been found to be in a bad state of repair, and the chancel condemned as being unsafe.

The church was repaired and "beautified," as the parish record hath it, in the early part of the present century, at which time the present Perpendicular windows were inserted, and the oak pews put up, which latter, though displaying to our eyes poor work, still are very fair, considering the period they were designed in. The outside of the church and the fine substantial tower have also been coated with a brown cement, to which time has now given a not unpleasing colour. The stonework alone appears on the spire of the tower, which is very graceful, and is much admired.

A still later addition was made to the church of a north transept, the arch of which it has been deemed necessary to secure in the present alterations.

The work now in progress comprise a north aisle the whole length of the nave, the modern transept being incorporated into it; it is divided from the nave by an arcade of four Transitional (Decorated to Perpendicular) arches on octagonal-shaped pillars.

At the east end of this aisle is introduced a vestry large enough to hold the organ, which will face the chancel.

The double arches between the tower and nave of the church have been re-opened, and the modern gallery removed; these arches are very curious; the tower, being for some 30 ft. up of Norman work, was originally attached to an older church, which was removed at a later period and the present church built, the west wall of which was built against the east wall of the tower, pierced with a high Perpendicular arch, which stands out in front of the fine semi-circular arch in the tower wall behind; the effect is peculiar and interesting.

The whole floor of the nave is being lowered to the old level, and the chancel floor will be raised by several steps to a higher level towards the altar.

The old chancel has been taken down, and a new one, in Late Decorated style, built on the old lines.

The south porch,—a modern erection in cement,—has been removed, and a new porch, Decorated in style, put in its place.

A new oak altar and reredos are being made. The latter will be in three compartments, filled in with mahogany panels, upon which are painted Scriptural subjects, after the manner of the Early Italian masters, which has been kindly executed and presented to the church by Mr. Andrew Donaldson, a resident in Bitteswell, which reflects great credit upon his artistic powers. The centre panel represents the Holy Child in the manger, between the Virgin Mother and St. Joseph, boy angels float about singing the "Gloria in Excelsis," whilst others kneel adoring.

The two side panels are filled in with angels adoring and playing on various musical instruments.

The woodwork of the reredos is in oak, and designed in the Perpendicular style.

The works are being carried out by Messrs. Law & King, from the designs and under the superintendence of Mr. Walter F. Lyon, R.I.B.A., of Lincoln's Inn-fields, London.

INDIAN ARCHITECTURE.

Sir,—After the warm eulogy by Sir R. Temple at the Institute, on the 5th inst., of Indian architecture, the following notes on some of the buildings referred to may be acceptable. They are mainly within the red sandstone fort of Akbar at Agra, and form an architectural group of unsurpassed beauty and interest. No creed possesses a temple of worship expressing a purer spirit of devotion than the Taj, or Moti Musjid, "the Pearl of Mosques," with its gleaming white domes crowned with gold, its silent marble aisles, its basement, arches, spandrels, and friezes of pure white marble, inlaid with exquisite designs in coloured stones. The sarcophagi of Shah Jehan and his wife Noor Jehan, are inlaid with agate, carnelian, bloodstone, and lapis lazuli, and there are numerous inlaid Arabic inscriptions in black marble. Surrounding these is a glorious marble screen of perforated tracery panels, each 6 ft. high and 3 ft. wide, with the frames inlaid with precious stones brought from all parts of India, from Persia, Arabia, and Ceylon.

With all this, the effect is one of such perfect purity that the opening lines of Wordsworth's sonnet have been applied to this building,—

"Quiet as a nun, breathless with adoration,"

And certainly human love never raised a more beautiful memorial of its joy and sorrow than "the dream in marble" on the banks of the Jumna.

The mausoleum of Prince Elmah-Doulah, and other buildings, have external arches filled in with delicate geometrical tracery, and dados panels, and friezes of coloured ornament, inlaid in white marble. The pointed arch is universal, and is generally four-centred.

The Diwan-i-Am, or public audience-hall, is 200 ft. long by 75 ft. wide, and has forty pillars supporting the roof.

Beyond the gardens is the Diwan-i-Khass, or private hall of audience, an exquisite chamber of white marble, with pillars of wonderful beauty. The white marble is everywhere relieved with graceful floral designs in precious stones, inlaid with marvellous art.

The Summan Boorj, a delightful little marble summer-house, overlooks and commands a splendid view of the River Jumna, on which boats of grotesque shape, laden with corn, float lazily down. It is as beautifully ornamented as the other buildings. To this charming little retreat the ladies of the harem had access. On plan it is an octagonal room, surrounded by an arcade, and it is surmounted by a cupola with a gilded dome. Geometrical designs, in coloured marbles, adorn every part. Here the Emperor played on the marble chequered floor with his women the game of "pachesse," and snatches of Persian song were heard from an adjacent tower. Not far distant is the harem bath-room. It is a large dimly-lighted chamber, covered with paintings and mirrors, in which many a lovely form has doubtless been reflected. The water entered in cascades over rows of lamps.

The Khass Mehal, or private drawing-room, also overlooks the river, and has windows of marble trellis, panels of marble or alabaster so thin as to be semi-transparent. Next are the private apartments of Shah Jehan, of plain red sandstone, in which he died in virtual captivity to his son.

The Palace of Jehanger stands beside that of his son, and, though in ruins, is distinctly of Hindoo character. Wooden buildings, with beams, lintels, and immense brackets, are slavishly copied in stone.

The Mosque (142 × 56) is a broad pavilion of several aisles, separated by rows of columns and arches. The perfection of its proportions, and the marvellous combination of simplicity and grace strike every beholder. Nothing calls for admiration but pure architectural design, whereas in the Taj one might be overcome by the vast wealth of gems and marbles, and the great evidence of human labour.

The late Mr. Bayard Taylor says,—"To my eye it is absolutely perfect. While its architecture is the purest Saracenic, which some suppose cannot exist without ornament, it has the severe simplicity of Doric art. It has, in fact, nothing that can be properly called ornament. It is a sanctuary, so pure and stainless, recalling so exalted a spirit of worship, that I felt humbled as a Christian to think that our noble religion has never inspired its architects to surpass this Temple to God and Mahommed.

These monuments, with their Mosaic ornaments, have recently been restored by the Government of the North-Western Provinces of India as far as possible to their original integrity, and at a cost of some thousands of pounds. This is a graceful and generous act, the effect of which will not be thrown away upon the people. It may be added that beautiful gardens, with majestic trees and shady walks, set off these monuments to the best advantage.

These few notes show that Sir Richard Temple was fairly justified in the praise he bestowed on Indian architecture, but that "the Great Mogul was perhaps the greatest architectural genius who ever lived, not excepting the ancient Greeks," may be questioned, inasmuch as the buildings of Agra are not absolutely unique and original. What architectural work is? Perhaps there will be a more general admission of the statement that "in respect of taste, imagination, and everything that related to beauty and sublimity, and to æsthetic culture," the natives of India far surpassed us. H. T.

TEMPLE BAR.

Sir,—In reference to the re-erection of Temple Bar, as alluded to in the address of the President of the Royal Institute of British Architects, I observed that he did not name any very appropriate site to replace it. I have looked forward with hope that some of your able contributors might rescue it from annihilation, and, seeing no such movement, I have therefore taken this opportunity of suggesting that it would be a very good position if rebuilt at Storey's-gate, St. James's Park, in place of the present mean iron gate at the end of Great George-street. If the City authorities would part with the old stones it would be a noble and a useful retirement from its former busy and admired position, now, however, outgrown its original purpose. It would be sufficiently large and appropriate for the park entrance, as would the statues on either side.

The supporters of the royal shield of arms should be reinstated as formerly over the foot entrances, and the arms over the centre arch, with a trophy of banners, &c., not forgetting to show, by a tablet or in some other way, to posterity its original name and situation, where now stands the useful and handsome memorial to its respectful memory. W. H.

THE LATHING STAFF.

Sir,—At page 248 of the third edition of Moxon's "Mechanick Exercises" (1703) mention is made of a plasterer's tool called a "lathing-staff." It is figured as resembling somewhat an old-fashioned boar-spear, having a broad lance-shaped head, a short shaft with a hook at the end, and a short cross-arm through the shaft a little below the head. Moxon described it as "a *lathing-staff of iron*, in the form of a cross, to stay the cross laths while they are nailed to the long laths, and also to clinch the nails."

I am very desirous of learning whether a tool answering this description is at present in use by plasterers, and whether it still goes by the same name. If it is not now in use, whether such a tool is known to have been formerly so; and also what equivalent tool is now used.

Alex. Beazeley, M. Inst. C.E.

LIGHTING BUILDINGS.

Sir,—Having to fit an electric lighting apparatus in a building for the purpose of illuminating a screen, I am at a loss to know where to place the light so as to secure the greatest amount of illumination on the screen. The building is 80 ft. by 40 ft. The light must be placed on a gas-pipe which runs along the middle of the building from end to end, and is 30 ft. from the ground. The screen is on the wall directly under the gas-pipe, the middle of it being 23 ft. below the gas-pipe. Can any of your readers tell me how far to place the light from the wall? If some one would give a rule for finding the distance it would oblige Electricity.

LIBEL ON A DISTRICT SURVEYOR.

KNIGHTLEY *v.* LETT.

It was stated that the plaintiff in this case (Queen's Bench) was district surveyor at Hammersmith, and the defendant, who was a retired solicitor, owned some property in Hammersmith. The defendant wrote to the Board of Works complaining that the plaintiff left his business in Hammersmith to be managed by another person, whilst he himself carried on business elsewhere, and that he had attempted to extort money when it was wanted to call him as a witness. The plaintiff claimed damages for these statements as libellous, and at the trial before Mr. Justice Mathew, the jury found for the plaintiff, damages, 150*l*.

Mr. Murphy, Q.C., for the defendant, now moved for a rule to show cause why there should not be a new trial. He submitted to the Court that the learned Judge had not properly directed the jury upon the question of privileged communication, and also as to some other matters, that the verdict was against the weight of the evidence, and that the damages were excessive.

Rule granted.

VARIORUM.

"Modern Alphabets," designed by Martin Gerlach (Fischer, St. Bride-street), are overflowery. Nevertheless, they are very well done, and may be found useful by writers, bookbinders, and others.——"Simple Hydraulic Formulæ," by T. W. Stone (Spon), has for its main object the purpose of enabling miners and others engaged in sluicing operations, or in the use of water for other purposes, to check the quantity supplied to them. It does, however, more than this. It has many diagrams.——"The Wild Garden," by W. Robinson, F.L.S., illustrated by Alfred Parsons (the *Garden* office), is a charming little book, and ought to produce good results. Its object is to make our groves and gardens beautiful by the naturalisation of hardy exotic plants, and has suggestions for the regeneration of the bare borders of the London parks. Mr. Robinson has a genius of his own.——Diaries come before us from all sides. Those of Messrs. T. J. Smith, Son, & Co., are varied and well esteemed. They have large Scribbling Diaries and Small Scribbling Diaries, Diaries in limp covers and Diaries in tight; in fact, all may suit themselves if they will take the trouble to read the published list.——Messrs. Hudson & Kearns's Diaries we praised last year, and they have been improved. Their distinctive feature is their comprehensiveness, each volume forming in itself a complete set of books indexed and paged throughout. Nos. 12 and 13 are specially arranged for the use of architects and surveyors, but are most useful for all pro-

fessional or business purposes. They contain not only a diary which is virtually a day-book or journal, but a cash-book, ledger, or note-book, rent and insurance register, and the paper and binding are of unusual excellence. No. 11 is specially adapted to the requirements of those in the building trades, and contains a series of tables of a practical character, including the calculation of wages, the checking of estimates, &c. In all, the index is a valuable feature. — "The Garden Oracle and Floricultural Year-Book for 1882," edited by Mr. Shirley Hibberd, is the twenty-fourth annual issue, and contains a treatise on the cultivation of the rose; a synopsis of the roses of fifty years, comprising descriptions and characters of 1,500 varieties; selections of the best roses now in cultivation for exhibition and garden decoration; a new selection of potatoes for all purposes and all soils; notes on new inventions, implements, &c.; and many matters of interest to gardeners, amateurs, botanists, and lovers of the country.

CHURCH-BUILDING NEWS.

Darlington.—The usual Christmas decorations at St. Cuthbert's Church are this year supplemented by a piece of decorative work of a permanent character, the ancient panelling at the back of the chancel-stalls, which was destroyed in 1748, having, through the liberality of the Duke of Cleveland, lay rector of the church, been restored from the drawings of Mr. J. P. Pritchett. As every particle of the old panelling was destroyed, the restoration has been imitated from that now existing in the chancel of Staindrop Church, where the stalls, and especially the ends, are so exactly like those at St. Cuthbert's that they must have been executed from the same drawings, if not by the same hands. This is the more interesting as at that time one of the Neville family, who owned Raby and Staindrop, was Bishop of Durham, and changed the constitution of Darlington Church from a vicarage to a deanery. The work has been executed by Mr. Osborne, contractor, of Darlington, out of old English oak which, after being in the roof of Middleham Church for 300 years, was taken down and replaced lately by a modern roof of foreign oak, during a "restoration" of the church.

Halesowen.—It is proposed to restore the church here as a memorial to the late Archdeacon Hone, at a cost of about 2,000*l*. Mr. John Oldrid Scott is preparing the plans.

Miscellanea.

A Corporation in a Dilemma.—The Corporation of Newbury are in a dilemma as regards their gas undertaking. The new gasworks are now in use, but after spending the whole of the capital borrowed (25,000*l*.), and charging the gas consumers 5*s*. 6*d*. per 1,000, the undertaking is practically insolvent. At the Council meeting on the 20th inst., the chairman of the committee told the Board that the liabilities of the undertaking exceeded 2,000*l*., that the assets were between 500*l*. and 600*l*., and that their borrowing powers were exhausted. Mr. Elliott, the contractor, was commissioned to do the work; his charges were taken exception to; the matter was referred to arbitration, and the Council now find themselves in the unenviable position of having to pay 1,267*l*. of the 1,569*l*. charged by Mr. Elliott, together with the costs of the arbitration, which are considerable in amount. The whole matter is now in confusion. The late chairman of the Gas Committee has declined to serve on the committee, and the manager has resigned.

Sewage of Leyton, Essex.—The Local Board of Leyton, Essex, have entered into a contract with the Rivers Purification Association, of Gresham House, for the purification and disposal of the sewage of their district. In these works the method of pressing the sludge into a portable condition, recently introduced successfully at the Coventry Sewage Works, will be employed.

The Will (dated July 23, 1880) of Mr. William Lee, J.P., the senior partner in the firm of Lee, Son, & Co., cement manufacturers, late of Holborough-court, Snodland, Kent, who died on September 29th last, was proved on the 3rd inst. by Mr. William Henry Roberts, the grandson, the acting executor, the personal estate amounting in value to upwards of 124,000*l*.

The Smoke Nuisance.—Last week Mr. Ernest Hart delivered at South Kensington a lecture, in connexion with the exhibition, on "The Bases and Method of Smoke Abatement," to a large audience. Dr. Siemens presided. Mr. Hart commenced his lecture by referring to the influence of smoke upon health, in proof of which he stated that during the week of fog ended on the 7th of February, 1880, the mortality in London was higher than it had been at any time during the last forty years. The lecturer gave some statistics as to the rate of mortality in the metropolis and various large towns in England. He referred, also, to the enormous quantity of coal consumed in London, and as illustrating its injurious effects on public buildings, stated that the external surface of the Houses of Parliament was so injured by fog and smoke as to cost 2,500*l*. a year to maintain it. Every house in the metropolis was also a sufferer from the smoke nuisance. The use of anthracite coal was urged, and directions were given for the best means of burning it. Mr. Hart also suggested the organisation of an enlightened public opinion, which would assist first of all in the more general introduction of improved patterns for household grates and kitcheners by individuals, and the acceptance by speculative builders of the principle of adopting such improved grates as a means of heating their houses more readily. He urged also that great London houseowners should recommend to their tenants the use of smoke-abating grates and kitcheners. The Duke of Westminster, who had taken a great interest in the exhibition, had promised to bring the matter before his tenants, and the committee had decided to approach all the landowners in London in order to obtain their co-operation.

Blythburgh Church.—The Rev. H. Sykes, in a letter to the *Morning Post*, says, in replying to a previous letter on the state of the church, that it is quite true that this "venerable and magnificent pile is assuredly mouldering into sad decay, desolation, and ruin." The spectacle is painful in the extreme to any person who has a spark of love for what is grand and beautiful in architecture, but the question arises, what can be done to prevent the further decay and ultimate ruin of this noble building? Some steps have been taken already. A meeting of parishioners, convened by circular, was held in the school on October 7th, when a committee was appointed to consider the matter. The late Mr. G. E. Street was engaged by the committee to inspect and report. Mr. Street and his son made a thorough inspection of the building in the early part of November, and promised to draw out estimates for the various portions of the work to be undertaken. The architect's reports and estimates have been delayed by the illness and lamented death of Mr. Street, but as soon as these have been received they will be printed for circulation and extensively advertised in the public papers.

The Brighton Sanitary Exhibition.—Mr. Councillor Hamilton, the general hon. sec. of this successful exhibition, has been presented by the exhibitors with a mantel clock and silver salver. The presentation was made, on behalf of the subscribers, by Mr. James Doulton. Mr. Hamilton, in the course of the proceedings, stated that 1,150*l*. had been taken at the doors, and that as many as 3,000 people had paid their sixpence at the door after six o'clock in the evening. The awards made do not appear to have given satisfaction to all the exhibitors,—an old complaint.

The Purification of Air in Tunnels.—For underground railways Dr. Neale has suggested to place beneath the railway carriages trays filled with slaked lime or caustic soda solutions, which, combining chemically with the injurious gases, such as carbonic oxide, carbonic acid, and sulphurous acid, form harmless salts. For hospitals, Dr. Neale recommends a chemical punkah, whose fan being made of vegetable fibre, is saturated with caustic soda solution fed from a small tank above.

Electric Lighting.—Arrangements have been made for lighting up the town of Godalming by electricity. It was brought into operation on the 15th inst.. The utilisation of water-power is not the only novelty. The arc lights are set up in the main street, and Swan incandescent lamps, introduced for the first time for public lighting, in the ordinary gas-lamps in the smaller turnings. Only bare copper wire, upon insulators, is used for the latter; and further, there is no direct return-wire used.

The Proposed Interference with Timber Stacks in the Metropolis.—At the meeting of the Metropolitan Board of Works on the 23rd inst., a large deputation of timber merchants attended to present a memorial against the 18th clause of the Metropolis Management Building and Thames Floods Prevention Acts Amendment Bill. The clause would give the Board power to control the stacking of timber in London, and even to forbid the stacking, except in the suburbs. Mr. Penty, for the deputation, said they were already heavily handicapped by foreign competition, and any interference with their trade would prove ruinous. To remove timber-yards out of London would mean loss of work to many artisans; and, owing to the rapidity with which work had frequently to be done, it would prove impracticable. In answer to questions, he said the deputation did not represent the firewood trade, and would rather not offer any opinion as to the danger of stacking firewood in the neighbourhood of private houses. The memorial was referred to the Works Committee.

The Damage to Maryport New Dock.—Last week a meeting of the Maryport Wet Dock Committee was held at the Harbour Office, to receive the report of the engineers upon the damage done to the new dock works by the late violent storms. The report of the engineers (Sir John Hawkshaw, Son, & Hayter) was read, recommending that the sea works should be strengthened and heightened, and the structure of the higher portion of the works erected in accordance with a new plan which accompanied the report. The report also specified the price per yard to be paid for the extra work, which amounted to an estimated additional expenditure of 25,000*l*., and that the work be carried out by Mr. Doherty, the contractor. On the motion of the chairman, seconded by Mr. Briggs, the report was adopted. The original contract amounted to about 90,000*l*.

Changes at the Parliament House, Edinburgh.—The *Scotsman* says that a scheme has now been completed for the accommodation of Lord Rosebery, Under Secretary of State for Home Affairs, in the Parliament House buildings, and plans to give effect to the scheme have been prepared by Mr. Robertson, of H.M. Office of Works, exhibiting the nature and extent of the arrangements contemplated. The matter is now under consideration of the Treasury. In the first place, it is proposed to utilise the corner premises, formerly occupied by the Union Bank, for the formation of an additional court-room for jury trials and proofs. The remaining space occupied by the acquisition of the bank premises will admit of considerable re-arrangement of certain of the public departments, and the providing of better accommodation for them. It is expected that the work of adaptation will be proceeded with early in the New Year.

Memorial of the Late Lord Beaconsfield. The Rev. Henry Blagden, vicar of Hughenden, states that a large portion of the proposed memorial to Lord Beaconsfield at Hughenden has been completed. A west window, by Messrs. Clayton & Bell, has been erected, and the chancel wall has also been decorated by Messrs. Heaton, Butler, & Bayne, with paintings of evangelists, prophets, and angels, so as to harmonise with the east window, which is the gift of the late earl's executors. The remainder of the work proposed is in hand, to be completed by Easter, but the sum of 200*l*. is still needed to carry out the plan of the memorial.

Industrial Trades Exhibition in Nuremberg.—From May 15th to October 15th, 1882, a Bavarian Home Industrial Trades and Art Exhibition will be held in Nuremberg, under the immediate patronage of King Ludwig II. of Bavaria. The Bavarian State Ministers will support the exhibition to the fullest extent, and the Bavarian Industrial Museum, which is carrying out the arrangements for the exhibition, is doing everything to make it a success, a guarantee fund of 600,000 marks (30,000*l*.) having already been raised for it, mainly in Nuremberg.

Modelling at the Royal Academy.—We are glad to hear that Mr. Hugh Stannus has been appointed teacher of modelling in the Architectural School at the Royal Academy. We anticipate much advantage from the appointment.

Sir Antonio Brady.—It is proposed to build a chancel and to reseat the Church of St. John, Stratford, in memory of the late Sir Antonio Brady, who was anxious that the work should be undertaken.

The Dome of St. Sophia.—The dome of St. Sophia, at Constantinople, is again reported to be in a dangerous condition, and threatens soon to fall in. The cause is attributed to the restoration which was carried out forty years ago by an Italian architect, Signor Fossati, who removed a number of the wooden supports that were previously found under the cupola. The interest of all civilised peoples in this edifice is such that it is to be hoped the best available advice will be obtained.

TENDERS

For sewering, &c., Chapel-grove, Lorne-grove, Gloucester-road, and Roe-street, Urmston, for the Barton-upon-Irwell Rural Sanitary Authority. Quantities by the engineer, Mr. John Price, Assoc. M. Inst. C.E.:—

Henry Prescott & Co., Peudleton	£1,966	14	0
Solomon Holt, Miles Platting	1,762	2	8
Matthew Naylor, Hulme	1,573	10	0
John Mackay, Hereford	1,466	0	0
Edmund Bird, Chorlton	1,304	8	6
Wm. Thos. Moss, Stafford	1,288	14	3
Wm. Snape & Son, Eccles	1,193	10	8
W. H. Worthington, Manchester	1,090	4	8
J. Rendall, Weaste	1,046	0	0
S. Cowburn, Hindley (accepted)	1,000	10	6

For pulling down and rebuilding the Bull's Head public house, Tottenham-court-road, for Mr. Hyams. Mr. E. Brown, architect:—

C. Marr	£7,227	0	0
Perry & Co.	7,000	0	0
S. Salt	6,850	0	0
C. Dickenson	6,450	0	0
J. Morter	6,450	0	0
F. & F. J. Wood	6,194	0	0
W. Shurmur	6,093	0	0
Jackson & Todd, Hackney - road (accepted)	5,920	0	0

For the erection of a detached residence at Barnwood, near Gloucester, for Mr. Chas. Jeynes. Mr. Capel N. Tripp, architect:—

James Clutterbuck, Gloucester	£935	0	0
Alfred King, Gloucester	977	0	0
Edward Godwin, Gloucester (accepted)	878	0	0
F. C. Allen, Gloucester	870	0	0
John Webb, Birmingham	819	0	0

For erecting a farm-house at Ufford, for the Right Hon. Lord Kesteven. Messrs. Richardson, architects:—

Thompson, Derby	£774	0	0
Sharp Bros., Little Bytham	732	0	0
Roberts & Johnson, Ashton	704	0	0
Dean, Uppingham	686	0	0
Roberts Bros., Stamford	663	0	0
Wallis, Spalding	649	0	0
Story & Son, Bourn	648	16	0
John Woolston, Stamford	619	0	0
Allister, Wisbech	616	0	0
Perkins, Easton	615	0	0
Scholes, Stamford	599	0	0
Hinson, Stamford	569	11	9
Thos. Woolston, Stamford (accepted)	540	0	0
Dobson, Stamford	482	12	0

For sewers, Cronch-hill, for Mr. M. L. Cassell. Messrs. Hills & Fletcher, surveyors:—

Hubbard	£317	0	0
Taylor	276	0	0
Joseph Jackson, Upton	266	10	0
Rowley	264	10	0

For building three new cottages in Northey-street, Limehouse, for Dr. Vickers. Mr. Chas. Dunch, architect:—

Higgs	£826	14	0
Shurmur	765	0	0
Taylor & Co.	629	0	0
Palmer	537	10	0
Walker	510	0	0

For alterations at Railway Tavern, Victoria Park Station, for Messrs. Truman, Hanbury, & Co. Mr. B. J. Capell, architect:—

Hearle & Son	£472	0	0
Keetch	432	0	0
Shurmur	432	0	0
Marr	409	0	0

For the erection of school buildings, &c., in the Alma-road, St. Alban's, for the St. Alban's School Board. Messrs. J. & S. F. Clarkson, architects. Quantities by Messrs. Hodgson & Mundy:—

Monk, Two Waters	£3,447	2	6
White, Dunstable	2,960	0	0
Carlin, St. Alban's	2,907	18	6
Capper, St. Alban's	2,886	16	11
Edey, Son, & Co., St. Neots	2,788	0	0
Potter, Leicester	2,769	0	6
Savage, St. Alban's	2,694	6	0
Jones & Co., Gloucester	2,637	0	0
Matthews, Dover	2,625	5	6
Rayment & Son, Hertford	2,588	4	0
George, Stoney Stratford	2,586	3	7
C. Miskin, St. Alban's (accepted)	2,483	0	0
Ireson, Northampton	2,465	0	0

For Masonic Hall, Devonport. Mr. J. F. Burns, architect:—

J. Dart, Devonport	£675	0	0
J. Healy, Devonport	622	10	0
H. Gill, Devonport	550	0	0
R. D. Rowe, Devonport	535	0	0
T. Jenkin, Devonport	530	0	0
A. R. Lethbridge, Plymouth	475	0	0
G. H. Smith, Devonport	469	0	0
J. Harley, Plymouth (accepted)	447	0	0

For erecting offices, stables, cooperage, cask-shed, &c., at the new Swan Brewery, Walham-green, for Messrs. Stansfeld & Co. Mr. W. Bradford, architect. Quantities by Messrs. J. & A. E. Bull:—

G. H. & A. Bywaters (accepted)	£10,427	10	0

For alterations to premises, 224, Goswell-road, for the Metropolitan Provident Medical Association. Mr. Wm. Bradford, architect:—

John Emery	£274	0	0
J. Newton	257	0	0
W. H. Snow	225	0	0
Joseph Edgar (accepted)	207	0	0

For shop-front and internal fittings, 34, Bank-buildings, Hackney. Messrs. W. Waymouth & Sons, architects:—
Shurmur (accepted).

For additions to works, St. Alban's, for the "Turner" Gas Engine Company (Limited):—
C. Miskin (accepted) £254 0 0

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